

Faculty of Education, Language and Communication

The Effects of Using Quizlet on Vocabulary Knowledge Performance of College EFL Learners in Shandong Province, China

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The Effects of Using Quizlet on Vocabulary Knowledge Performance of College EFL Learners in Shandong Province, China

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

This study investigates the effect of Quizlet on the receptive and productive vocabulary knowledge of college EFL learners at a higher learning institution in Shandong Province, China, guided by Nation's vocabulary knowledge framework. It also examines learners' perceptions of Quizlet through an adapted Technology Acceptance Model (TAM). The research addresses four key questions: (1) the difference in receptive vocabulary performance between learners using Quizlet and traditional methods, (2) the difference in productive vocabulary performance between these groups, (3) learners' perceptions of Quizlet, including perceived ease of use, usefulness, attitudes, behavioral intention, and actual usage, and (4) differences in these perceptions between high- and low-proficiency learners. A quasi-experimental design was employed with 191 participants from four classes, divided into an experimental group using Quizlet and a control group using paper-based word lists over eight weeks. Vocabulary performance was assessed through receptive and productive recall tests, while perceptions were gathered via questionnaires and semi-structured interviews. Results indicated that Quizlet significantly enhanced vocabulary knowledge, with the experimental group outperforming the control group in both receptive and productive tests. Additionally, learners expressed positive attitudes towards Quizlet, particularly regarding ease of use, usefulness in vocabulary learning, and a strong intention to continue using it. High-proficiency learners, in particular, showed a greater inclination to continue using Quizlet compared to their low-proficiency peers. These findings suggest that integrating Quizlet into college English courses not only enhances vocabulary acquisition but is also well-received by students, highlighting its potential as a valuable educational tool.

Keywords: Quizlet, EFL, college students, vocabulary learning, receptive vocabulary knowledge, productive vocabulary knowledge, perception

Kesan Penggunaan Quizlet terhadap Prestasi Pengetahuan Kosa Kata Pelajar EFL Kolej di Wilayah Shandong, China

ABSTRAK

Kajian ini menyelidik kesan penggunaan Quizlet terhadap pengetahuan kosa kata reseptif dan produktif dalam kalangan pelajar kolej yang mempelajari bahasa Inggeris sebagai bahasa asing (EFL) di sebuah institusi pengajian tinggi di Wilayah Shandong, China, berpandukan kerangka pengetahuan kosa kata oleh Nation. Ia juga meneliti persepsi pelajar terhadap penggunaan Quizlet dengan menggunakan Model Penerimaan Teknologi (TAM) Terubahsuai. Kajian ini menjawab empat persoalan utama: (1) perbezaan prestasi kosa kata reseptif antara pelajar yang menggunakan Quizlet dan kaedah tradisional, (2) perbezaan prestasi kosa kata produktif antara dua kumpulan ini, (3) persepsi pelajar terhadap Quizlet: kemudahan penggunaan, kebergunaan, sikap terhadap penggunaan, niat tingkah laku, dan penggunaan sebenar, serta (4) perbezaan persepsi antara pelajar berkemahiran tinggi dan rendah. Kajian ini menggunakan reka bentuk kuasi-eksperimen dengan 191 peserta daripada empat kelas, dibahagikan kepada kumpulan eksperimen yang menggunakan Quizlet dan kumpulan kawalan yang menggunakan senarai kosa kata dalam bentuk kertas selama lapan minggu. Prestasi kosa kata diukur melalui ujian ingatan reseptif dan produktif, manakala persepsi pelajar diperolehi daripada borang soal selidik dan temu bual separa berstruktur. Dapatan menunjukkan prestasi pengetahuan kosa kata kumpulan eksperimen mengatasi kumpulan kawalan dalam kedua-dua ujian reseptif dan produktif secara signifikan. Selain itu, pelajar menyatakan sikap positif terhadap Quizlet, terutamanya dari segi kemudahan penggunaan, kebergunaan dalam pembelajaran kosa kata, dan keinginan yang kuat untuk terus menggunakannya. Pelajar berkemahiran tinggi menunjukkan kecenderungan yang lebih tinggi untuk terus menggunakan Quizlet

berbanding rakan-rakan mereka yang berkemahiran rendah. Dapatan ini menunjukkan bahawa pengintegrasian Quizlet ke dalam kursus Bahasa Inggeris kolej bukan sahaja meningkatkan pemerolehan kosa kata tetapi juga diterima baik oleh pelajar dan ini menggambarkan potensi Quizlet sebagai medium pendidikan yang bernilai.

Kata kunci: *Quizlet, Bahasa Inggeris sebagai bahasa asing, pelajar kolej, pembelajaran kosa kata, pengetahuan kosa kata reseptif, pengetahuan kosa kata produktif, persepsi.*

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LIST OF ABBREVIATIONS

EFL	English as Foreign Language Learning
TAM	Technology Acceptance Model
CNKI	China National Knowledge Infrastructure
CET-4	College English Test Band 4
CET-6	College English Test Band 6
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
TRA	Theory of Reasoned Action

CHAPTER 1

INTRODUCTION

1.1 Chapter Overview

This chapter provides the background to the study, the statement of the problem, the study's objectives, the research questions, the research hypotheses, the significance of the study, and the operational definition of terms. Finally, the chapter ends with the organization of the study.

1.2 Study Background

English is widely acknowledged as a significant instrument for facilitating economic, commercial, technological, and cultural interactions on a global scale, as well as for fostering the process of modernization (Hu, 2005; Liu et al., 2023). Since 1978, the Chinese government has adopted an open-door policy and placed emphasis on the processes of modernization and internationalization. English has become increasingly important to Chinese people as China has opened to the outside world. As a result, various official measures have been implemented to facilitate the advancement of foreign language education (Hu, 2005; Guo et al., 2023). This has been especially true since China joined the World Trade Organization (WTO) in 2001 (Wang et al., 2017). Moreover, According to Pan (2015), there exists a correlation between the Chinese aspiration for English proficiency and the notions of modernity and prosperity. The author further asserts that the prevailing ideology surrounding language acquisition in China posits that individuals must possess a high level of English fluency to attain success in both educational and occupational domains.

As a result, there has been a continual and unshakable emphasis on the acquisition of the English language in China, which currently holds the record for the largest population engaged in the pursuit of English language education in the world (Hu, 2005). Moreover, China has become the largest country regarding the significant number of English learners in mainstream educational institutions, ranging from primary school to university students (Wu, 2001). Although the number of English learners is enormous, the level of English proficiency in China is relatively low, while the fact is that only a tiny fraction of those who are English learners can speak English well (Wang et al., 2017; Shao, 2022). For undergraduate and college students, especially those who are not proficient in English, the college English course could improve their English proficiency (Jia, 2022). It is their compulsory course as one of the basic courses in the higher education system (Jia, 2022).

Further, the college students come from different backgrounds, some through summer Gao Kao (college admission test administered in summer), and some through spring Gao Kao (college admission test administered in spring). Their different backgrounds and levels of English knowledge result in difficulties in college English teaching (Luo, 2022). In addition, many college students have little interest in learning English and pay inadequate attention to English learning (Luo, 2022; Shao, 2022). Although, college students have a relatively clear understanding of the importance of college English. Still, their English knowledge level is very low, and their lack of vocabulary is one of the reasons why they find English difficult (Luo, 2022; Shao, 2022). In addition, the questionnaire results of Man and Shen (2020) demonstrated that College students' English vocabulary level is low. Many students exhibit a lack of interest in

acquiring English vocabulary and demonstrate a negative disposition towards this material (Man & Shen, 2020).

However, vocabulary acquisition is essential in English language learning, which educators and scholars have widely acknowledged (Baleghizadeh & Ashoori, 2011; Harahap, 2023; Lin, 2023; Özer & Koçoğlu, 2017; Schmitt, 2008; Schmitt, 2008; Sembiring & Simajuntak, 2023; Uchihara & Clenton, 2023; Woodeson, 2023). For example, Cinar and Ari (2019) argued that students should know sufficient words to be successful in listening, speaking, writing, and reading skills. Without sufficient vocabulary, improving these four basic skills is impossible. Similarly, according to Hikmah (2019), vocabulary is the foundational knowledge needed to grasp a language; it helps students comprehend what they read and hear, and it's also essential for their ability to express themselves linguistically; it can promote their ability to produce appropriate words in different contexts. Moreover, Foster (2009) also showed that the lack of vocabulary is often seen as a barrier to a student's progress, as vocabulary knowledge affects any learner's overall language ability.

In other words, the acquisition of vocabulary is a fundamental component in the process of acquiring a foreign language, as it plays a crucial role in enhancing foreign language proficiency and fostering the development of effective communication skills (Nation, 2001). Insufficient vocabulary makes learners unable to express their meaning accurately and hinders effective communication (Hu, 1997). Moreover, inadequate vocabulary can limit one's ability to understand and produce speech and text (Anjaniputra & Salsabila, 2018). Furthermore, it is imperative for students to acquire proficiency in English vocabulary prior to effectively articulating their thoughts and ideas through oral

communication or written expression (Lin, 2023; Setiawan & Wiedarti, 2020; Harahap, 2023).

According to the Curriculum Standards for College English in Higher Vocational Education (2021 version), college students should master roughly 500 new words and a specific number of phrases during Year 1. Most of the students use the rote learning method in word memorization, but the learning effect is not good (Li, 2021; Li, 2022; Man & Shen, 2020). Moreover, in China, undergraduate students and college students must take college English courses, as it is a compulsory course in China universities and colleges. Although many researchers have emphasized the importance of vocabulary, as mentioned above, many Chinese college English learners still find it difficult to learn vocabulary (Shao, 2022; Zhou, 2020). In this study, college students refer to those who do not get higher entrance scores and only study for three years. They only get graduation certifications and will not get bachelor's degrees.

1.3 Problem Statement

College students possess a relatively low level of vocabulary knowledge and lack enthusiasm for English vocabulary acquisition, resulting in a negative attitude towards this aspect of language learning (Man & Shen, 2020). Man and Shen (2020) further stated that they remember vocabulary by rote, and although they spend a lot of time repeating the vocabulary learning process, they hardly remember the words they have learned. Nevertheless, the process of acquiring vocabulary necessitates the utilization of repetition or recycling of the language to facilitate the acquisition process (Schmitt, 2008). The utilization of technology for vocabulary acquisition enables learners to encounter repeated exposure to vocabulary, a method that is widely regarded as more efficacious than

extensive repetition (Nation, 2001). Therefore, in the field of vocabulary learning, the digital game-based method has garnered significant attention from researchers and language learners as well. In addition, some studies have shown that game-based learning could promote foreign language vocabulary learning (Al-Malki, 2020; Alyaz & Genc, 2016; An, 2018; Bueno-Alastuey & Nemeth, 2022; Franciosi et al., 2016; Huang et al., 2017; Kim, 2019; Li, 2021).

However, most studies focus on digital-based vocabulary learning to enhance learners' ability to pass specific examinations. For instance, Li (2021) conducted a quasi-experiment to verify whether a game-based vocabulary learning application, *Baicizhan*, facilitates Chinese students' College English Test Band 4 (hereafter CET-4) vocabulary learning. The study conducted by Huang et al. (2017) investigated the impact of mobile game-based vocabulary learning on motivation and vocabulary learning performance. Their study was designed to prepare for the Taiwan General English Proficiency Test. The absence of a feature that enables users to generate their own educational material within a game-based vocabulary learning application poses challenges for both students and teachers in integrating it effectively within the classroom setting. This limitation arises from the lack of alignment between the content on the application and the subject matter being taught in the educational environment. Teachers and students need an application that allows them to edit their vocabulary content and enter the words they need to learn in class into applications. The digital game-based vocabulary learning tool, Quizlet, allows users to create their vocabulary learning sets (Cunningham, 2017) and has attracted the attention of both researchers and learners.

Therefore, Quizlet, as one of the famous and widely used vocabulary learning applications, has been investigated by many studies (Al-Malki, 2020; Cha & Kim, 2016; Chaikovska & Zbaravska, 2020; Cho, 2021; Jeong et al., 2018; Hikmah, 2019; Senior, 2022) and the researchers conducted an investigation to ascertain the efficacy of Quizlet as a tool for enhancing vocabulary acquisition within their own language learning environment. Furthermore, numerous extant studies pertaining to Quizlet have employed tests to assess the effectiveness of it as a tool for vocabulary acquisition (Ali & Kassel, 2018; Chaikovska & Zbarayska, 2020; Özer & Koçoğlu, 2017). However, the previous studies mentioned above did not distinguish the receptive and productive knowledge in their studies, so it is not easy to justify whether Quizlet is beneficial to receptive vocabulary knowledge performance or productive vocabulary knowledge acquisition as DeKeyser and Sokalski (1996) stressed that the acquisition of both receptive learning and productive learning necessitates specific practice to be effectively mastered. According to Nation (2000) and Nation (2013), knowing a word involves knowing the "form," "meaning," and "use" of the words, while "meaning" is further divided into "form and meaning," "concept and referents," "associations," each aspect involves receptive and productive vocabulary knowledge. Hence, it is imperative to examine the impact of Quizlet as a tool for acquiring receptive and productive vocabulary knowledge.

Numerous prior studies have been undertaken to ascertain the efficacy of Quizlet as a tool for vocabulary acquisition across various contexts and subjects (Bueno-Alastuey & Nemeth, 2020; Cinar & Ari, 2019; Dewi, 2023; Okkan & Aydin, 2020; Pham, 2018; Sanosi, 2018; Susila, 2023), few studies were conducted in mainland China, and seldom research focused on the effectiveness of Quizlet used by China college English as Foreign Language (EFL) learners. Chinese college English learners, who comprise a sizable

portion of learners of English as a foreign language, need further validation of the effectiveness of their use of Quizlet for college English vocabulary learning because different language backgrounds may have different learning effects in using Quizlet. Therefore, it is necessary to investigate the effects and learners' perceptions of the new technology if it is to be integrated into another context (Hsu, 2013).

It is necessary to investigate the similarity and differences among different English proficiency level learners' perceptions towards using Quizlet in their college English course learning process. Individual differences in understanding the content of a learning approach arise from variations in cognitive processes, perceptions, learning experiences, and strategies among learners at different levels (Teng, 2019). Moreover, according to Teng (2022), it is crucial for educators to employ caution when selecting supplemental learning methods, taking into consideration the proficiency levels of their students. Higher-ability learners may derive advantages from targeted supplemental learning techniques, whereas lower-ability students may encounter challenges in processing such strategies in the learning process. Ultimately, educators should be mindful of the linguistic disparities among their students. Furthermore, Ku et al. (2014) highlighted the idea that the potential benefits of incorporating digital game-based learning might be dependent upon a particular subset of learners, rather than being universally applicable to all learners. This is because learners may exhibit varying preferences for pedagogical approaches and possess distinct learning styles. The proficiency level of students is a significant factor that may have a correlation with their task performance, and it is crucial for researchers to consider this variable when examining the impacts of pedagogical approaches.

Therefore, knowing the difference between the high and low-level proficiency college EFL learners' perceptions towards using Quizlet could facilitate the most effective use of Quizlet by students as well as teachers in college English courses and provide learners with a more specific direction according to learners' proficiency level for integrating Quizlet-based vocabulary learning method in college English courses for English language learning.

1.4 Research Aim, Objectives, and Questions

In this section, the research aim, the research objectives, the research questions, and the research hypotheses are presented.

1.4.1 Research Aim

This study aims to examine the effects of using Quizlet in vocabulary acquisition among college EFL learners at the Weifang Institute of Technology in Shandong Province, China, and their perceptions of using Quizlet in language learning.

1.4.2 Research Objectives

The specific objectives of this research are:

1. To examine the effect of Quizlet-based vocabulary learning on receptive vocabulary knowledge of college EFL students,

2. To examine the effect of Quizlet-based vocabulary learning on productive vocabulary knowledge of college EFL students,

3. To investigate the perceptions of college EFL learners regarding the use of Quizlet as an English vocabulary learning tool.

4. To compare the perceptions of high and low-proficiency college EFL learners regarding the use of Quizlet as an English vocabulary learning tool.

1.4.3 Research Questions

The following questions serve as guidance for achieving the aim and objectives. Research Objective 1 aligns with Research Problem 1, whereas Research Objective 2 corresponds to Research Question 2. Research objectives 3 and 4 align with research questions 3 and 4. Research questions 3 and 4 each consist of five sub-research questions, as shown below.

1. What are the effects of Quizlet-based vocabulary learning on the learners' receptive vocabulary knowledge?

2. What are the effects of Quizlet-based vocabulary learning on the learners' productive vocabulary knowledge?

3. What are the perceptions of college EFL learners regarding the use of Quizlet as a tool for learning English vocabulary?

a. What are the learners' perceptions of the actual system usage of Quizlet?

b. What are the learners' perceptions of the usefulness of Quizlet?

c. What are the learners' perceptions of the ease of use of Quizlet?

d. What are the learners' attitudes toward using Quizlet?

e. What are the learners' behavioral intentions toward using Quizlet?

4. Is there a difference between high and low-proficiency college EFL learners regarding their perceptions of Quizlet as a tool for learning English vocabulary?

a. Is there a difference between high and low-proficiency learners in their perceptions of the actual system usage of Quizlet?

b. Is there a difference between high and low-proficiency learners in their perceptions of the usefulness of Quizlet?

c. Is there a difference between high and low-proficiency learners in their perceptions of the ease of use of Quizlet?

d. Is there a difference between high and low-proficiency learners in their attitudes toward using Quizlet?

e. Is there a difference between high and low-proficiency learners in their behavioral intentions toward using Quizlet?

1.4.4 Research Hypotheses

For the research question one, two and four, each research question has a corresponding research hypothesis as shown in Table 1.1.

Table 1.1: Research objective, research question and research hypothesis

Research Objective	Research Question	Research Hypothesis

Table 1.1 Continued

1. To examine the effect of Quizlet-based vocabulary learning on the receptive vocabulary knowledge of college EFL students.	1. What are the effects of Quizlet-based vocabulary learning on the learners' receptive vocabulary knowledge?	H_{01}: There is no significant difference between the Quizlet and non-Quizlet groups' receptive vocabulary knowledge performance of college EFL students. H_1: There is a significant difference between the Quizlet and non-Quizlet groups' receptive vocabulary knowledge performance of college EFL students.
2. To examine the effect of Quizlet-based vocabulary learning on the productive vocabulary knowledge of college EFL students.	2. What are the effects of Quizlet-based vocabulary learning on the learners' productive vocabulary knowledge?	H_{02}: There is no significant difference between the Quizlet and non-Quizlet groups' productive vocabulary knowledge performance of college EFL students. H_2: There is a significant difference between the Quizlet and non-Quizlet groups' productive vocabulary knowledge performance of college EFL students.
4. To compare the perceptions of high and low-proficiency college EFL learners regarding the use of Quizlet as an English vocabulary learning tool.	4. Is there a difference between high and low-proficiency college EFL learners regarding their perceptions of Quizlet as a tool for learning English vocabulary?	H_{04a}: There is no significant difference between high and low-proficiency learners regarding their perceptions of the actual system usage of Quizlet. H_{4a}: There is a significant difference between high and low-proficiency learners regarding their perceptions of the actual system usage of Quizlet H_{04b}: There is no significant difference between high and low-proficiency learners regarding their perceptions of the usefulness of Quizlet H_{4b}: There is a significant difference between high and low-proficiency learners regarding their perceptions of the usefulness of Quizlet H_{04c}: There is no significant difference between high- and low-proficiency learners regarding their perceived ease of Quizlet H_{4c}: There is a significant difference between high and low-proficiency learners regarding their perceived ease of

Table 1.1 Continued

	Quizlet H_{04d}: There is no significant difference between high and low-proficiency learners regarding their attitudes toward using Quizlet H_{4d}: There is a significant difference between high and low-proficiency learners regarding their attitudes toward using Quizlet H_{04e}: There is no significant difference between high and low-proficiency learners' behavioral intention toward using Quizlet H_{4e}: There is a significant difference between high and low-proficiency learners' behavioral intention toward using Quizlet.

1.5 Significance of the Study

With the development of digital game-based vocabulary learning applications, many studies focused on investigating its effectiveness for language learners. This study also investigated the effects of a digital game-based vocabulary application on vocabulary learning among EFL learners. It took one of the worldwide famous digital game-based vocabulary learning applications/websites, Quizlet, as an intervention. By answering the four research questions, this study will make theoretical, contextual, methodological, and pedagogical contributions to college EFL learners' digital game-based vocabulary learning literature.

1.5.1 Theoretical Significance

This study is based on Nation's (2013) Vocabulary Knowledge Framework, which involves nine different aspects of knowledge, each of which can be further categorized into receptive and productive vocabulary knowledge. Nation (2013) also suggested effective strategies for vocabulary acquisition, including retrieval, flashcards, repetition, and the use of pictures. The current research examines the effects of using Quizlet on the receptive and productive vocabulary knowledge performance of college EFL learners, guided by Nation's (2013) Framework of Vocabulary Knowledge and his most effective vocabulary learning strategies. By integrating the first and second objectives, this study allows future researchers to understand the effects of using Quizlet for college EFL learners in the Chinese context from various perspectives. Moreover, based on Nation's (2013) Framework of Vocabulary Knowledge, this study not only validates the framework's applicability in modern learning environments but also enriches it by combining a digital game-based vocabulary learning method with an empirical study (Quizlet intervention). Specifically, the study found that the digital game-based vocabulary learning method (Quizlet) can significantly enhance learners' performance in both receptive and productive vocabulary knowledge, offering new teaching methods and tools for educational practice. This also paves the way for a deeper integration of educational technology and language learning theory in the field of vocabulary acquisition.

Moreover, the current research investigated college EFL learners' perceptions of using Quizlet as a tool for English vocabulary learning. To address objectives three and four, Arshad et al.'s (2012) Modified Technology Acceptance Model (TAM), which is an extension of Davis et al.'s (1989) original TAM, was used. This model includes six factors: Awareness, Perceived Usefulness, Perceived Ease of Use, Attitude, Behavioral Intention,

and Actual System Usage. The Modified TAM is particularly relevant to this study as it provides a robust theoretical framework for understanding the process by which learners accept new technologies and identifies the key factors that influence their attitudes and behaviors. Through the insights provided by the TAM model, this research explores how application design affects learners' experiences, including interface layout, interaction methods, and feedback systems. It also examines how these design elements can be combined with game-based features to enhance learners' satisfaction and engagement. From a theoretical perspective, applying the TAM model to study learners' perceptions of game-based vocabulary learning applications not only helps validate and expand the model's applicability in educational technology but also fosters the development and innovation of theories related to the acceptance of educational technology

1.5.2 Contextual Significance

The study has contributed to the literature that only some empirical studies focused on the effects and learners' perception of Quizlet conducted in mainland China. Quizlet, as one of the famous and widely used vocabulary learning applications, has been investigated by many studies (Al-Malki, 2020; Chaikovska & Zbaravska, 2020; Cha & Kim, 2016; Cho, 2021; Hikmah, 2019; Jeong et al., 2018; Senior, 2022). However, it is necessary to investigate the effects and learners' perceptions of the technology if it is to be integrated into another context (Hsu, 2013). According to An and Williams (2010), digital game-based vocabulary learning can motivate students, but some cultural groups find it unfamiliar and difficult. In the context of China, the empirical studies focused on Quizlet are mainly conducted in Taiwan province; Chien (2013) and Chien (2015) investigated Taiwanese EFL learners' perception of making Quizlet vocabulary flashcards. There are

few studies about Quizlet conducted in mainland of China. Therefore, this study seeks to fill the gap in research on Quizlet's effects and perceptions on Chinese EFL college English learners' vocabulary learning simultaneously and lay the groundwork for future replication in China and the EFL context.

1.5.3 Methodological Significance

Secondly, the methodological significance of the study was triangulation in methods, data, source, and analysis to get in-depth results on the use of Quizlet as a vocabulary learning tool. Many previous studies (Ari, 2019; Cinar & Chaikovska & Zbaravska, 2020; Dreyer, 2014; Lam et al., 2018; Waluyo & Bucol, 2021) only used quantitative method; the present study used a mixed method to triangulate the research findings. A subset of the research investigations solely concentrated on examining the effect of Quizlet as a tool for enhancing vocabulary acquisition (Ali & Kassel, 2018; Özer & Koçoğlu, 2017), while other previous studies only involved learners' perceptions towards the use of Quizlet (Çeçen, 2020; Korkealehto & Siklander, 2018; Lam et al., 2018; Lander, 2016), these studies did not investigate the effects of Quizlet and learners' perceptions at the same time. Some of the studies used the method of an experiment to examine the impact of Quizlet on the acquisition of vocabulary, but these studies did not conduct with the control group, only an experimental group (Al-Malki, 2020; Bueno-Alastuey & Nemeth, 2020; Cho, 2021; Dreyer, 2014; Davie & Hilber, 2015; Hikmah, 2019; Senior, 2022). Although these studies examined whether Quizlet was effective in vocabulary learning, other variables that may contribute to the observed progress, such as the practice effect (Sanosi, 2018). However, the research design employed in this study was a quasi-experimental design, utilizing both an experimental group and a control group,

assigning pre- and posttests to each group to minimize potential factors that could coincidentally account for gains by experimental group members.

1.5.4 Pedagogical Significance

Finally, the pedagogical significance in the study was that the findings of this study will be of value not only to students, teachers, and module designers but also to policymakers. College English learners and teachers will benefit from the research findings, which are additional learning and teaching resources, and textbook writers will find help in developing or updating these resources. If this study were to demonstrate the efficacy of Quizlet in enhancing vocabulary acquisition in college-level English courses, for the policymakers, they could potentially consider implementing this intervention as a supplementary tool within mainstream education. This could potentially elevate the vocabulary learning and teaching process to a higher level. Moreover, if the intervention is successful, it can effectively promote vocabulary acquisition and improve language proficiency based on the positive correlation between vocabulary knowledge and language proficiency. Furthermore, it can offer systematic guidance and serve as a point of reference for the enhancement of vocabulary knowledge within a classroom environment.

1.6 Operational Definition of Terms

The objective of this section is to provide readers with a comprehensive comprehension of the key terms utilized in this thesis. The operational terms in this section included Quizlet, receptive vocabulary knowledge, productive vocabulary knowledge, performance, perception, college EFL learners, and college English courses.

1.6.1 Quizlet

Quizlet is a widely utilized web-based educational platform that enables individuals to generate and review digital flashcards and employs a diverse range of learning tools based on gamification principles (Van et al., 2020). Students have the option to engage in game-based activities as a means of reinforcing their acquisition of new vocabulary. Quizlet, a popular online learning platform, offers two distinct game options: *Match* and *Gravity*. The game of *Match* involves the user's task of correctly associating a given target word with its corresponding definition (Van et al., 2020). Learners can use Quizlet via a browser (http://quizlet.com) or mobile application. In addition to searching for other people's flashcards, students can make their own and share them with others (Cunningham, 2017; Van et al., 2020). It facilitates memorization and is beneficial for learning many subjects, particularly language and vocabulary (Sanosi, 2018). Quizlet has a free platform and optional subscription, with the paid version ($35.99/year) offering advanced classroom tracking and the ability to original pictures and audio (Cunningham, 2017). In this study, students used Quizlet's free version, while the teacher used paid version to track students' activities and upload original pictures when necessary. Students first need to create an account and sign in, which allows tracking individual progress and linking to share sets.

1.6.2 Vocabulary

There are different definitions of vocabulary from different perspectives. Generally, vocabulary can be defined as the knowledge of words and word meanings or a list of words in alphabetical order with their definitions (Alizadeh, 2016). According to Kusrini (2012), vocabulary is a sum of words used and understood by students. According to Setiawan and

Wiedarti (2020), vocabulary can be conceptualized as a collection of numerous words utilized for interpersonal communication. Additionally, it is important to note that many words possess connotations that contribute to their diverse range of meanings. Moreover, vocabulary constitutes an essential element within the English language, as it enables learners to comprehend the content of texts. In the present study, vocabulary is defined following Stahl and Nagy (2006), as vocabulary includes all the words one knows from listening and uses in speech and print, including reading and writing.

1.6.3 Receptive Vocabulary Knowledge

Receptive vocabulary use involves perceiving the form of a word while listening or reading and retrieving its meaning (Laufer & Goldstein, 2004; Nation, 2001). In this study, receptive vocabulary knowledge refers to understanding a word when it is seen. This study measured receptive vocabulary knowledge performance by a receptive recall test. The receptive recall test was adapted from Webb (2005), in which participants were asked to write the native language word form with the target word as a cue.

1.6.4 Productive Vocabulary Knowledge

The *Productive* vocabulary use involves wanting to express mean through speaking or writing and retrieving and producing the appropriate spoken or written word form (Laufer & Goldstein, 2004; Nation, 2001). Productive vocabulary knowledge in this study refers to the knowledge to produce a word when one writes. This study measured productive vocabulary knowledge performance by a productive recall test. The receptive recall test in this study was adapted from Webb (2005), in which participants were given

the native word meanings and asked to write the form of target words in which the meanings were paired.

1.6.5 Performance

The term "performance" is used for evaluating one's level of task performance based on test or scale results (Ary et al., 2010). In this study, performance refers to the student's scores on the pretest and posttest. The tests used to measure the performance of college EFL learners' vocabulary knowledge were the receptive vocabulary knowledge recall test and the productive vocabulary knowledge recall test, which were adapted from Webb (2005).

1.6.6 Perception

Perception is a positive or negative way of thinking about how one view or interprets a situation in their surroundings (Lindsay & Norman, 1972, cited from Çeçen, 2020). Scholars can use Davis' (1989) Technology Acceptance Model (TAM) to study EFL learner's attitudes toward mobile-assisted language learning (MALL) because applying TAM allows researchers to explore their perceived usefulness and perceived ease of use toward using MALL from the perspective of EFL learners (Hsu, 2013). Arshad et al. (2012) further developed the TAM model. In the study, perception refers to EFL learners' attitudes and perceived ease of use, perceived usefulness, actual system usage, and behaviour intention on using Quizlet as their college English vocabulary learning tool. The perceptions in this study were measured by a questionnaire compiled according to the Arshad et al. (2012) adapted TAM model, and the results were cross validated by the semi-

structured interview. These five constructs' operational definitions in the current study are as follows:

Perceived usefulness: It represents the extent to which learners believe that employing a technology tool, particularly, would reinforce their EFL vocabulary learning.

Perceived ease of use: It stands for the extent to which learners believe using a specific technology tool would be free from effort.

Attitude towards use: It is related to the degree to which learners favor a particular technology tool for their EFL vocabulary learning.

Behavioral intentions: It is operationalized as the continued students' intention to perform foreign language learning-related activities using one or another technology tool.

Actual system use: It is described concerning the recurrence of the usage of specific technology tools by learners in the EFL context.

1.6.7 College EFL Learner

College EFL Learner in this study refers to regular students enrolled in short-cycle course at higher education institution who are taking English as a foreign language. These students will receive certificates of graduation; however, they will not be granted certificates of degree completion. The course is three years, and the college English course is a compulsory curriculum, extending over two semesters during the Year 1.

1.6.8 College English Course

In this study, College English course is a compulsory introductory course for college students. College English Course Curriculum Standards (2021 edition) states that the basic module is compulsory for college students of higher vocational education. It is offered in the first and second semesters, with 128 ~ 144 hours, usually 16 ~ 18 class hours count as one credit and a total of 8 credits. The extension module is usually offered in the 3rd - 5th semester, and students can take more than two credits according to their needs. Based on the whole course hours of the basic module, each institution and each specialty can independently decide the opening and content of the expansion module according to future needs and realistic conditions.

Furthermore, college English is an integral part of higher education and a compulsory introductory course for college students. College English is a teaching system guided by the theories of foreign language teaching, with English language proficiency and application skills, cross-cultural communication, and learning strategies as the main contents, and integrates various teaching modes and methods. The teaching objective of College English is to cultivate student's comprehensive English application ability, especially listening and speaking ability, so that they can communicate effectively in English in their future studies, work, and social activities, and at the same time, improve their independent learning ability, enhance their comprehensive cultural quality, and meet the needs of our country's social development and international communication.

1.7 Organization of the Study

This chapter started with the study's background before identifying the research gap. Together with the definition of operational terms, it also included the study's

objectives and the introduction of the research questions. The literature on Quizlet-based vocabulary learning will be reviewed in Chapter 2. The research design, the justification for the selected methodology, and the study's ethical considerations will all be covered in Chapter 3. In Chapter 4, the study's findings will be presented. In Chapter 5, the findings of the study will be discussed, conclusions drawn, and recommendations for further research as well as implications for educators, students, schools, and policymakers.

CHAPTER 2

LITERATURE REVIEW

2.1 Chapter Overview

This chapter begins with the concept of vocabulary, and the following sections focus on digital-based vocabulary learning and Quizlet-based vocabulary learning. Next, the chapter touches on the theories that relate to this study, and the conceptual framework used in the study is presented. It will also highlight the literature gaps addressed by the current study. Finally, the chapter concludes with a section summarizing what has been discussed in the chapter.

2.2 Vocabulary

For language learners, vocabulary is crucial, and building a large enough vocabulary is required for efficient communication (Nation, 2000). The acquisition of vocabulary holds a pivotal role in language acquisition and is of significant significance to individuals learning a language. Words serve as the fundamental components of a language, as they assign labels to objects, actions, and concepts. Without a sufficient vocabulary, individuals are unable to effectively communicate their intended meaning (Ghazal, 2007). Language teachers and learners recognize that vocabulary knowledge receives the most attention in terms of learning a second or foreign language, where inadequate vocabulary knowledge is often blamed for many of the difficulties encountered in language use (Nation, 1990).

Words can be categorized into two primary forms: oral and written. The oral form encompasses listening and speaking, while the written form pertains to the words we

identify and employ in reading and writing. Vocabulary acquisition can be categorized into two distinct types: receptive and productive. Receptive vocabulary encompasses the lexicon of words individuals can comprehend and identify upon auditory or visual exposure. In comparison, the productive vocabulary encompasses individuals' lexicon during oral or written communication (Alizadeh, 2016).

2.2.1 Aspects of Vocabulary Knowledge

Vocabulary knowledge means the knowledge of words and their meaning together; in other words, vocabulary knowledge encompasses not only the definitions of words but also how they are utilized in various contexts worldwide (Bourana et al., 2023). Over the years, lexical researchers have proposed various criteria for classifying vocabulary knowledge. For example, Qian (2002) proposed a theoretical framework for understanding vocabulary knowledge, encompassing four key dimensions. The first dimension pertains to vocabulary size, indicating an individual's number of words. The second dimension concerns the depth of vocabulary knowledge, referring to the extent of one's understanding and familiarity with words. The third dimension focuses on lexical organization, encompassing words' storage, linking, and representation within the mental lexicon. Lastly, the fourth dimension encompasses the automaticity of receptive and productive knowledge, encompassing the fundamental processes of accessing word knowledge for understanding and production purposes.

Nation (2001, 2013, 2022) proposed a set of 18 questions that categorized vocabulary knowledge into three different categories: form, meaning, and use. These categories encompass both the receptive and productive aspects of vocabulary acquisition. The form encompasses three components: spoken form, written form, and word parts. The

concept of meaning encompasses various aspects, such as form and meaning, concept and reference, as well as associations. The usage of language encompasses various grammatical functions, collocations, and constraints. The other researcher, Henriksen (1999), proposed a framework consisting of three dimensions to assess lexical competence: depth of knowledge, receptive and productive knowledge, and partial to precise knowledge.

In summary, researchers widely agree on categorizing vocabulary knowledge into the realms of receptive and productive. Vocabulary acquisition is a long process, as learners acquire certain aspects of vocabulary knowledge before others, and not all simultaneously (Bourana et al., 2023; Nation, 2013, 2022; Schmitt, 2007). To accurately master new terms, a learner must encounter and apply them repeatedly. Therefore, the current study only focused on the parts of receptive and productive vocabulary knowledge of the meaning and form.

2.2.2 Receptive and Productive Vocabulary Knowledge

Numerous scholars and researchers in the field of vocabulary research make a distinction between two types of word knowledge: passive (receptive) and active (productive) knowledge (Bourana et al., 2023; Laufer & Goldstein, 2004; Meara, 1990; Nation, 2001, 2013, 2022; Webb & Nation, 2017). According to Laufer and Goldstein (2004), receptive knowledge is associated with listening and reading, which means that learners can perceive the form of the word and retrieve its meaning(s). Productive knowledge, on the other hand, is linked to verbal communication and written expression skills, allowing learners to effectively employ the appropriate linguistic form to convey their intended meaning (Laufer & Goldstein, 2004). Furthermore, Bourana et al. (2023) noted that the usage of receptive vocabulary entails recognizing a word's form while

reading or listening and receiving its meaning. Conversely, productive vocabulary knowledge involves locating and creating the right spoken or written word form to convey meaning through speech or writing. Additionally, Webb and Nation (2017) pointed out that receptive knowledge is the understanding of words through reading or listening that permits a person to distinguish between various parts of a word. On the other hand, productive knowledge focuses on the information needed to utilize a word, such as collocations and its spoken or written form. The descriptions above all emphasized that productive vocabulary knowledge is associated with word form, whereas receptive vocabulary knowledge is related to word meanings.

Similarly, there are also some researchers categorize vocabulary knowledge into receptive and productive skills (Bueno-Alastuey & Nemeth, 2020; Nation, 2013, 2022). According to Nation (2013, 2022), in reading or listening, the former refers to the ability to recall and recognize a word, whereas the latter refers to the ability to use it when speaking or writing. In receptive recall, students are asked to produce the meaning of target words, whereas in productive recall, they generate the target word form that corresponds to the given meaning. While in receptive recognition, learners must select the meaning of the target words instead of producing them, in productive recognition, learners must select the target word form that matches the given meaning.

Various vocabulary acquisition tasks can have distinct effects on the acquisition of receptive and productive vocabulary knowledge (De La Fuente, 2002; Teng & Xu, 2022; Webb, 2007). For example, Teng and Xu (2022) investigated the effects of task type and repetition frequency on improving vocabulary knowledge. Their research findings showed that productive tasks (sentence translation and sentence writing) contributed to

significantly higher scores than receptive tasks (multiple-choice and gap filling) regardless of repetition frequency, and some forms of productive tasks were more effective than others. This finding is supported by San-Mateo and de Diego's (2021) study that the productive task (sentence writing) allowed students to learn significantly more words receptively and productively than the receptive tasks (definition-choosing and gap-filling). The findings of Teng and Xu (2022) also showed that repetition helps to promote students' performance, but its effect stats to decline after the first several retrievals.

However, there are also different research findings on the effects of task type on vocabulary knowledge acquisition. For instance, Webb (2007) examined the effects of contextualized and decontextualized vocabulary learning tasks on the participants' vocabulary knowledge acquisition. The experimental group was instructed in vocabulary acquisition using glossed sentences, whereas the comparison group was taught target words through word pairs. The study findings showed that there was no statistically significant distinction observed between the two groups in terms of their acquisition of various types of word knowledge. But the author concluded that explicit vocabulary learning tasks could reinforce the connection between form and meaning. This is because the establishment and cultivation of a strong form-meaning link could potentially facilitate the acquisition of syntagmatic and paradigmatic associations as well as grammar.

Various retrieval tasks result in varying improvements in vocabulary acquisition. According to Webb (2009), it has been argued that the process of receptive retrieval is associated with more substantial improvements in receptive knowledge, whereas productive retrieval is more effective in acquiring productive knowledge. Furthermore, Webb (2009) assessed vocabulary proficiency across five dimensions, namely orthography,

association, syntax, grammatical function, and meaning and form. This evaluation encompassed both receptive and productive testing methods. The findings of the study indicate that engaging in productive learning activities resulted in more substantial improvements in both receptive and productive knowledge. Teng and Xu (2022) also found that productive tasks are more effective in improving learners' vocabulary knowledge acquisition than productive ones. Webb (2009) further emphasized that participating in receptive learning activities led to more notable enhancements in receptive knowledge specifically related to meaning. Hence, employing a singular method may potentially enhance the efficacy of acquiring word pairs through productive learning.

Some scholars believe that learners' receptive vocabulary size and productive vocabulary size are not the same amount, and most scholars believe that receptive vocabulary knowledge size is bigger than productive vocabulary knowledge size (Mun, 2023; Nation, 2013, 2022; Schmitt, 2019; Webb, 2005) Learners acquire receptive vocabulary knowledge before productive vocabulary knowledge, and there is a gap between the amount of productive vocabulary and the amount of receptive vocabulary (Schmitt, 2019). However, some scholars believe that specific vocabulary learning methods can improve the effectives of vocabulary knowledge acquisition and narrow the gap between productive and receptive vocabulary (Abu-Joudeh et al., 2023; Nation, 2013, 2022; Tan et al., 2023). Therefore, the present study tried to investigate the effectiveness of digital game-based vocabulary learning methods (such as Quizlet) in improving the acquisition of receptive and productive vocabulary knowledge of Chinese college EFL learners.

2.2.3 Receptive and Productive Vocabulary Knowledge Test

Vocabulary knowledge assessment encompasses various aspects, as vocabulary knowledge including various aspects, such as word's form, meaning, and use (Nation, 2013, 2022). Word form encompasses various modalities of language expression, such as spoken and written forms, as well as word parts. On the other hand, meaning encompasses the relationship between form and meaning, including the connection between concepts and referents, as well as associations. Additionally, the use of words involves grammatical functions, collocations, and limitations on their usage. Vocabulary meaning is a fundamental aspect of vocabulary knowledge, and an effective vocabulary assessment should evaluate the ability of learners to connect the word form with the corresponding concept it represents (Laufer & Goldstein, 2004). While most of assessments primarily or indirectly emphasize meaning and form connection (Laufer & Goldstein, 2004, Nation, 2013, 2022). Tests that examine the relationship between form and meaning indirectly differ in appearance from tests that assess word-meaning directly. Direct assessments of the connection between form and meaning involve tasks in which learners are required to exhibit their comprehension of the intended meanings of target words or generate the appropriate linguistic form corresponding to given meanings. The form-meaning connection is a fundamental aspect of the subject being examined, such as in the case of evaluating associations, either independently or in combination with other domains of knowledge (Laufer & Goldstein, 2004, Nation, 2013, 2022).

When testing vocabulary knowledge some scholars divide the test into vocabulary recall test and vocabulary recognition test (Laufer & Goldstein, 2004; Matwangsaeng, 2023; Webb, 2007). In addition, some scholars made distinction between passive, active

vocabulary knowledge and receptive, productive vocabulary knowledge (Laufer & Goldstein, 2004; Meara, 1990). According to their opinions, passive knowledge is linked to reading and listening, and it suggests that we can recognize a word's form and deduce its meaning or meanings. Simultaneously, active knowledge is linked to verbal and written communication and denotes the ability to retrieve the suitable spoken or written form of the meaning we wish to convey (Laufer & Goldstein, 2004). Four levels of meaning knowledge were identified by Laufer and Goldstein (2004): active recall, passive recall, active recognition, and passive recognition. According to their research, the capacity to provide the word's meaning is referred to as passive knowledge, and the capacity to provide the word's form is referred to as active knowledge.

Several studies proposed the types of recall and recognition test to assess the vocabulary knowledge (Laufer & Goldstein, 2004; Nation, 2013, 2022; Schmitt, 2010; Webb, 2005, 2007). For example, in Laufer and Goldstein's (2004) study, the point of active recall is to provide the target foreign language word while the meaning in the native language is the prompt. In their study, to deter students from providing nontarget words, the first letter of the target word is given for an active recall test. On the other hand, showing that learners understand the meaning of the foreign language word is the intent of the passive recall task. The learners are required to provide the native meaning for the foreign language word that is prompt. The meaning's initial letter is given. Selecting the target word from these four options is the active recognition task. The target word's meaning in its original language is the prompt; the target word's meaning in another language and three semantically irrelevant distractions are the options. In the passive recognition task, the learners must select the target word's meaning in their native

language from four options after being given the word as a prompt. The distractors in the productive recognition task are words with meanings in native languages.

Other studies investigating the effects of different learning tasks in improving receptive and productive vocabulary also used vocabulary test types similar to those used in Laufer and Goldstein's (2004) study. For example, Teng and Xu (2022) stressed that multiple-choice and gap-filling are receptive exercises, requiring participants to recognize the target words. At the same time, sentence translation and sentence writing are both productive. They used a controlled production test to assess the improvement of productive vocabulary knowledge with their intervention. The productive vocabulary test was a recall test, where students had to fill in the sentence gap with the correct translation of the underlined part of an equivalent native language sentence. The sample is as follows, "太阳升起，阳光穿过墙上的裂缝照进来 When the sun rises, light shines through_____." In another study conducted by Matwangsaeng (2023), they used a productive measure of word meaning to measure learners' ability to recall a word based on the form-meaning aspect. In their study, the native language prompt was provided first, and the test-takers were required to write the English word by following an initial letter provided. In Tong's (2023) study, similar productive and receptive recall tests were used, as recall can better explain the productive and receptive language proficiency scores than meaning recognition tests (Laufer & Goldstein, 2004).

The knowledge of form-meaning relationships, which can be arranged as a hierarchy of four degrees of strength: active recall, passive recall, active recognition, and passive recognition, is the primary component of vocabulary knowledge that Laufer and Goldstein (2004) investigated. Furthermore, they demonstrated that the strongest

correlation between classroom success in foreign language performance and knowledge of passive recall (receptive recall), or the capacity to retrieve the meaning of given words, was found. Asking students to construct a sentence using a given word is one technique to gauge their productive word knowledge, but the method is unreliable because students can construct a grammatically correct sentence without truly understanding how to use the word (Schmitt, 2010). Moreover, Nation (2013) contends that a recall task that requires the target word to be remembered—such as translating a word from one's native language to another—can be used to assess productive knowledge.

Moreover, different learning tasks and vocabulary knowledge tests may lead to different score results for vocabulary knowledge performance (Iwaizumi & Webb,2023; Mugableh & Alruwaili, 2023; Teng & Xu, 2022; Webb, 2005, 2007; Wilde, 2023). For instance, Teng and Xu (2022) conducted a quasi-experimental study. They found that productive tasks contributed to significantly higher scores than receptive tasks regardless of repetition frequency, and some productive tasks were more effective than others. Iwaizumi and Webb (2023) investigated the effect of test format on the productive recall of derivatives and found that test format influences test-takers' ability to recall knowledge to produce derivatives. In addition, Webb (2005) used productive knowledge, receptive knowledge of meaning, and form tests to investigate the efficacy of receptive learning tasks and productive learning tasks. Specifically, the productive knowledge of meaning and form test was assessed through a writing meaning test, in which learners were provided with word meanings in their native language and asked to write the words that the meanings had been paired with the treatment. Meanwhile, the receptive knowledge of meaning and form test was a receptive translation test, in which the target words cue response of native language word form.

Additionally, Webb (2005) showed that measuring vocabulary acquisition solely through receptive or productive tests can produce misleading results. Rather, measuring a particular aspect of knowledge through receptive and productive tests may yield a much more accurate assessment of the type and degree of learning that has taken place. Therefore, in this study, the receptive vocabulary knowledge test adopted a passive recall task, and the productive vocabulary knowledge test adopted an active recall task that was adapted from Laufer et al. (2004) and Webb (2005).

2.2.4 Explicit and Implicit Vocabulary Learning

Implicit and explicit learning approaches can be used to classify methods of vocabulary acquisition (Ma & Kelly, 2006). Explicit learning, as used in cognitive psychology, describes the processing of input data with the deliberate goal of determining whether the data contains regularities and, if so, determining which concepts and rules can be used to capture these regularities. Unintentional, subconscious input processing is known as implicit learning (Hulstijn, 2005).

In addition, Ellis (1994a) provided definitions for implicit and explicit learning. The process of implicit learning, as described by Ellis (1994a), pertains to the innate and subconscious acquisition of information regarding the fundamental organization of intricate stimuli. The process of explicit learning entails a deliberate approach wherein individuals formulate and verify hypotheses while actively seeking patterns or structure (Ellis, 1994a). Another concept that is closely associated with implicit learning and explicit learning is the distinction between intentional learning and incidental learning. Hulstijn (2005) posits that intentional learning refers to a form of learning in which the learner is informed in advance of the task that they will subsequently be evaluated on their ability to

retain specific categories of information. In contrast, incidental learning refers to a cognitive phenomenon wherein participants are not provided with prior notification regarding forthcoming memory assessments pertaining to specific categories of information. According to Hulstijn (2001), a crucial operational distinction exists between incidental and intentional learning, which hinges on whether students are informed about the subsequent testing of their acquired knowledge.

Researchers have conducted empirical studies to examine the efficacy of implicit and explicit vocabulary acquisition. Khatib and Ghannadi (2011) conducted a study to examine the impact of explicit and implicit learning on the acquisition of phrasal verbs. The researchers discovered that the group receiving explicit intervention demonstrated significantly superior performance to the group receiving implicit intervention in recognition and production tasks. The individuals in the implicit group acquired knowledge of target phrasal verbs through the utilization of marginal glosses as a mechanism to capture their attention. The individuals in the explicit group acquired knowledge of target phrasal verbs by using marginal glosses and engaging in specific production tasks. The study incorporated reading materials consisting of passages carefully chosen from two books, *English Phrasal Verbs*, and *English Phrasal Verbs in Use*. After each text's completion, various components are designed to assess reading comprehension. These components include questions that test understanding, tasks that require information reconstruction through paraphrasing, exercises involving filling in missing words, and activities that involve storytelling using visual aids.

In her research, Laufer (2005) presented findings from three separate studies, demonstrating that the implementation of explicit vocabulary exercises resulted in an

approximate 70% acquisition rate of the targeted words as measured by immediate receptive posttests. Despite experiencing a decline to 21-41% on posttests that were delayed by two weeks, these results still surpass the findings reported in studies on implicit learning. In a computer-assisted language learning experiment conducted by Andringa et al. (2011), 81 participants whose second language was Dutch were selected as subjects. These participants were divided into two groups, one receiving explicit instruction and the other receiving implicit instruction on two specific grammar structures. The study revealed that explicit instruction demonstrated greater effectiveness compared to implicit instruction. According to Schmitt (2008) and Laufer (2005), deliberate vocabulary acquisition with a specific emphasis on learning is significantly more efficient than incidental vocabulary learning. According to Schmitt (2008), deliberate vocabulary acquisition with a specific emphasis on explicit instruction enhances the ability to learn a substantial number of words rapidly and increases the likelihood of long-term retention.

While explicit learning has been found to be effective in facilitating vocabulary acquisition, it is important to note that explicit learning alone may not sufficiently address the need for word recycling and the comprehensive instruction of various contextual aspects of word knowledge. This limitation arises due to time limitations and the inherent difficulty in teaching word knowledge components like collocation (Schmitt, 2008). In relation to vocabulary acquisition, Ellis (1994b) argues that the acquisition of new words and phonetic and phonological features occurs implicitly through exposure. Additionally, the development of articulating word forms is believed to occur implicitly because of practice. Nevertheless, acquiring word meanings necessitates a deliberate and conscious effort to establish and comprehend the associations between form and meaning. According to Schmitt (2008), it is argued that establishing the connection between meaning and form

is crucial during the initial stages of vocabulary acquisition. Furthermore, intentional learning is considered the most effective approach to achieving this objective. The primary emphasis of this study was on the correlation between receptive and productive vocabulary learning, with particular attention given to the meaning-form connection.

Therefore, using explicit vocabulary learning techniques emerges as a highly effective approach to acquiring vocabulary knowledge. This study adopts Ma and Kelly's (2006) definition of "implicit" and "explicit", which refers to the primary characteristics associated with the two paradigms. The concept of implicit learning pertains to the acquisition of knowledge in a manner that is innate, effortless, and centred on the extraction of meaning. In contrast, explicit learning necessitates greater conscious cognitive exertion beyond mere engagement in meaning-oriented tasks.

2.3 Vocabulary Teaching and Learning at College Level in China

Vocabulary learning is crucial in language learning (Schmitt, 2008). Vocabulary is the foundation of language and is integral to building language proficiency (Anjaniputra, 2018). Through vocabulary learning, learners can expand their vocabulary and improve their language skills. At the initial stage of language learning, vocabulary learning is often the first step in learners' exposure to and mastery of the language and plays a crucial role in the subsequent enhancement of all aspects of listening, speaking, reading, and writing (Nation, 2001; Nation, 2022; Schmitt, 2010).

2.3.1 The Current State of English Vocabulary Teaching and Learning

Vocabulary is also the key for students to learn English well, but vocabulary teaching still needs to improve in current college English teaching (Geng, 2022; Xiong,

2022; Zhang, 2023). Since college English is a public course constrained by factors such as credit hours, college English generally does not offer special vocabulary classes. However, it only integrates vocabulary teaching into the intensive reading and extensive reading of college English, which leads to vocabulary teaching in college English without a clear goal and. even some teachers will even neglect the vocabulary explanations, which also leads to the fact that students do not have a goal in vocabulary learning, and they do not know how to proceed with their vocabulary learning (Cheng, 2022; Ding, 2021). In addition, to meet social development needs, the Central Committee of the Communist Party of China (CPC) has made the policy of expanding enrolment efficiently. The number of students in colleges and universities has been increasing, and the number of teachers is relatively tense. Moreover, College English, as a public course, requires all college students who are not English majors to complete the course. Based on the above two points, group classes have become the preferred teaching format for college English courses. However, the problem of vocabulary teaching is also more apparent in the mode of joint classes. The number of students in joint classes is large. Their English proficiency varies greatly, with different levels of vocabulary pronunciation and vocabulary mastery, so it is difficult for teachers to take care of students at different levels through the content of unified teaching materials, which ultimately leads to difficulties in realizing the vocabulary teaching objectives (Zhang, 2023). In addition, many colleges and universities take the pass rate of the College English Band 4 or 6 as the standard to measure the level of English teachers. All factors, as mentioned earlier, have also led to many English teachers focusing on the study of examination questions and teachers paying more attention to cultivating students' language skills in the teaching process, such as teaching around improving test-taking ability while neglecting vocabulary teaching (Geng, 2022; Zhang, 2023).

Regarding teaching vocabulary in college English courses, the traditional way of teaching vocabulary is still the first choice for some teachers at the present stage (Geng, 2022; Zhang, 2023). The traditional way of vocabulary teaching is usually divided into three stages: the first step is to lead students to read aloud the words before explaining the text and give a simple explanation about the meanings of the words; the second step is to ask students to identify the meanings of the words by taking the sentences of the text involved in the words as an example when explaining the text; and the third step is to ask students to recite the words in the form of an after-class task after the completion of explaining the text (Du, 2021; Zhang, 2023). In the college English classroom, some teachers neglect the function of vocabulary, focus on the explanation of articles and grammar, and use the boring vocabulary teaching mode, i.e., leading and following reading, to prompt students to learn pronunciation and strengthen their memory, which makes vocabulary learning dull and lowers the quality and efficiency of students' memorization of vocabulary (Xie, 2023; Zhang, 2021). Geng (2022) conducted interviews and classroom observations of teachers in her school and found that 85% of the teachers used traditional methods of vocabulary instruction, such as mechanical exercises, leading words, word dictation, etc., and did not flexibly use a variety of teaching methods for vocabulary teaching, nor did they use a diversified evaluation mechanism for examining students' vocabulary learning. In addition, many College English teachers do not spend time and effort to explain vocabulary in depth in the classroom but only lead students to read words when explaining the text, which is a single teaching method; the classroom is boring, and the students' initiative in learning is not high (Geng, 2022; Yuan, 2023; Zhang, 2023).

The effect of college English vocabulary teaching is unsatisfactory, and students generally receive feedback that vocabulary learning is boring and uninteresting, with

difficulties in memorization, a low accumulation rate, and a high forgetting rate (Xie, 2023; Zhang, 2023).This phenomenon is related to the fact that for many years, English teaching in China's colleges and universities has been more profoundly influenced by traditional teaching modes and teaching concepts. The traditional teaching concepts lead to a single teaching method, which is related to the fact that the teacher first leads the students to read the vocabulary aloud and then explains the vocabulary's pronunciation, characteristics, lexical properties, translation, and so on one by one. However, with the development and change of society, students receive information through expanding channels. The amount of information they receive is also increasing, which has caused a particular impact on students' thinking and psychology and has caused students' resistance to this single duck-filling vocabulary teaching method. It is difficult for students to recognize this method psychologically. They do not have high motivation in vocabulary learning, so naturally, it is not easy to achieve good teaching results (Du, 2021). It is naturally challenging to achieve good teaching results (Ding, 2021; Du, 2021; Xie, 2023; Zhang, 2021). At the present stage, most teachers still adopt the single mode of reading words, explaining the meaning of words, explaining the usage, and example sentences. The classroom is still teacher-centered, and the students can only listen and memorize; no matter what textbook is used in college English, it will take at least one class to teach vocabulary according to such a vocabulary teaching procedure, but the effectiveness is minimal. In addition to the words in the vocabulary list, most teachers also explain other important words that appear in the text, and although there is a context for the text, there are still few opportunities for students to use them actively (Ding, 2021; Zhang, 2021). As a result, it is common for students to remember previous and forget later, remembering a lot but finding that they can use very little (Xie, 2023; Zhang, 2021). In the long run, students will find it boring and

tedious, and students' interest in English learning gradually diminishes, which in turn is not conducive to English teaching (Ding, 2021; Xie, 2023; Zhang, 2021).

Therefore, in college English courses, teachers need to take vocabulary teaching as an essential part of classroom activities, and students need to use scientific learning methods to lay a good foundation for subsequent English exams, as well as proficient use of English in life and work (Xie, 2023; Zhang, 2023). In addition, teachers need to change the traditional teaching methods, adopt various methods, and use modern teaching facilities to increase students' interest in learning and enhance the effectiveness of vocabulary teaching (Zhang, 2023; Xie, 2023). Finding a novel and effective vocabulary learning method has become a hot issue in language education. Moreover, the College English Teaching Guide issued by the government in China in 2020 clearly states that teachers should make full use of modern technologies such as computers and the Internet, take the initiative to create diversified teaching modes, and fully mobilize the students' subjective initiative in learning English (Wu & He, 2024). The standard English course for higher vocational education (2021 version) states that students must master about 2,600 words by taking a college English course. However, the motivation of college students to learn English vocabulary is weak. Most of them learn English vocabulary to pass the CET-4 or EET College English Test band 6 (hereafter CET-6) exams and prepare for future higher education exams (Geng, 2022; Zhang, 2023; Zhang & Perez-Paredes, 2021). Therefore, college students need to accumulate 2,600 words in college English classes to complete the course objectives of this required course of college English. They also need to accumulate more words through independent study to prepare for the CET-4 or CET-6 as well as for the further education exams (Chu & Wang, 2024; Long, 2022; Xiong, 2022). In such a context, a game-based vocabulary learning approach has emerged to stimulate learners'

interest in learning, enhance students' learning autonomy and improve learning effects by integrating game factors into the vocabulary learning process (He, 2023; Wang, 2023; Zhang, 2023). Therefore, in the current digital era, the research on game-based vocabulary learning methods is of great significance, which can not only enrich the way of vocabulary learning and enhance students' learning interest but also is expected to improve the learning effect and provide new ideas and methods for vocabulary teaching and learning.

2.3.2 Digital Game-based Vocabulary Teaching and Learning in China at College Level

With the development of digital technology, learners have more opportunities to choose vocabulary learning tools and resources. The emergence of digital platforms has greatly enriched learners' access to vocabulary learning, for example, through online dictionaries, word card apps, and interactive vocabulary games, enabling learners to learn vocabulary more conveniently and excitingly. According to the data from the end of March 2023 by the Blue Whale Education Think Tank and the Yiwang Qianfan Data Centre, among the foreign language learning apps with stable users in China, there is only one app with 10 million users - Baicizhan. In the study on the vocabulary learning effect of Baicizhan, Li's (2021) quasi-experiment shows that game-based vocabulary learning is more effective in improving learners' vocabulary scores, motivation, and self-confidence in CET-4 compared to traditional paper-based word lists. This result confirms the positive role of digital tools in vocabulary learning, especially the effectiveness of Baicizhan's game-based learning approach. However, there are some limitations in this study, such as the scope of the test is limited to receptive vocabulary knowledge, the results of the study show that Baicizhan helps learners' acquisition of receptive vocabulary knowledge, and the

vocabulary content is not well connected to the learning in the college English lesson. In addition, Dong's (2020) study further explored the application of Baicizhan in teaching practice. Through a comparison study, she found that word mobile learning integrated with teacher monitoring and classroom teaching significantly improved learners' vocabulary achievement. This result confirms Baicizhan's effectiveness and emphasizes the importance of teacher monitoring and classroom teaching in vocabulary learning. Li's (2021) and Dong's (2020) empirical studies show that Baicizhan is efficacious in improving college students' receptive vocabulary knowledge. However, according to Nation (2013, 2022), vocabulary knowledge consists of receptive vocabulary knowledge and productive vocabulary knowledge. Simply contributing to receptive vocabulary knowledge does not satisfy the teaching goal of college English courses in which students use English for listening, speaking, reading, and writing in the future. Moreover, Yang's (2019) questionnaire survey reveals the diverse views of college students towards Baicizhan. Although some learners were satisfied with the Baicizhan, more than half of the learners still preferred to use paper wordbooks for memorization. The respondent's feedback reflects the differences in acceptance and use of digital learning tools among different learners.

Although the studies on digital game-based vocabulary learning in China have achieved some research results, most of the digital game-based vocabulary learning Apps used in their study are designed to be test-orientated at various levels, the words in the vocabulary corpus do not match the vocabulary lists used in daily classroom teaching, and the online and offline content is prone to be disconnected, which affects students' learning of college English course (Li et al., 2020; Wang, 2023). Moreover, in teaching and learning college English, there is a need for a vocabulary learning tool that is used both for

preparing for the various exams and learning college English. In China, widely used vocabulary learning software, such as Bcizhan, Towords, Momo, Bubeidanci, Shanbay, etc., are mainly designed to pass the CET-4, CET-6, or other English tests, and the content of vocabulary learning is not tightly integrated with the college English courses, and it is not easy for the teachers to upload vocabulary learning content. To increase the easy-to-use functionalities, APP producers or providers should also pay particular attention to students' personalized needs by integrating students' curriculum into the functionalities of the APP (Li, 2021; Wang, 2023). Therefore, students' flow experiences could be aroused by seeking game-based learning APPs that directly associate the learning content with their lessons in a personalized, challenging, and enjoyable way (e.g., Li, 2021; Li et al., 2020). The worldwide popular vocabulary learning tool Quizlet allows learners and teachers to upload their vocabulary learning content as needed, which makes up for the fact that Chinese vocabulary learning software does not allow for easy editing of words by oneself. The special feature of Quizlet is that it can be used by using the Quizlet app or by logging on to Quizlet's official website at https://quizlet.com/. By using the Quizlet App or visiting the official website of https://quizlet.com/, teachers can edit the words according to the needs of the teaching content, can edit the words by importing existing texts, can edit the Chinese and English explanations of the words, and can input pictures related to the vocabulary words (Li et al., 2020; Wang, 2023).

In China, studies have been conducted on the effectiveness of Quizlet in enhancing vocabulary learning (Liu, 2022; Li et al., 2020; Wang, 2023; Yuan, 2023; Zhang, 2023;). For example, Zhang (2023) investigated the effect of game-based mobile learning on college English listening vocabulary learning by comparing two vocabulary learning apps, Quizlet and Wordsmith, with first-year non-English majors in the experimental group of 55

students and the control group of 48 students. A pre-test was administered in the first week of the semester, and a post-test was administered in the last week. The test consisted of 80 multiple-choice questions, in which the students were required to choose the correct one out of the four choices of Chinese meanings according to the words they heard. The study results showed that students in the experimental group had significantly higher scores than those in the control group and that combining Quizlet and Wordsmith was more effective than the traditional vocabulary learning method. The results of the interviews also showed that the game-based learning was exciting and that the rankings in the class test were very good at stimulating the students' motivation to learn. However, the type of questions in the test was only selected for the receptive vocabulary knowledge test, which could not reveal the effect on the improvement of productive vocabulary knowledge as well as the group of students were undergraduates, whether it also affected the vocabulary knowledge improvement of college EFL learners needs further research. In addition, Yuan (2023) explored the application of digital game-based vocabulary teaching methods during College English 1. The digital game-based vocabulary learning tool chosen was Quizlet. After a semester of teaching practice, the assignment carried out a questionnaire survey on the classroom experience of the students taught. The questionnaire results showed that the students held a positive attitude towards using Quizlet as a tool for vocabulary learning in the college English classroom and considered that the target population of this study is undergraduate students. The questionnaire items are only designed to find out whether students like Quizlet and whether Quizlet can improve their attention to learning. However, they do not involve the vocabulary-learning effect of Quizlet.

Some studies have explored the effectiveness of Quizlet in improving vocabulary in professional English （ Li et al., 2020; Wang, 2023). For example, Li et al.

(2020) conducted a quasi-experimental study on the effect of Quizlet on business English vocabulary acquisition in a university; 23 students in the experimental group used Quizlet to learn vocabulary, and 28 students in the control group used the traditional PPT (PowerPoint) mode of learning. The test questions were receptive vocabulary knowledge tests with 18 words. The study was administered over six weeks, and the results of the instant test showed that there was no significant difference between the performance of the experimental group and the control group, i.e., the Quizlet approach for learning vocabulary was not more effective than the traditional vocabulary approach in improving the vocabulary scores for the learners. The test in this study was only a receptive vocabulary test, and the number of words learned and tested was small. According to Nation (2013), too few questions in a vocabulary test can affect the validity of the test results. Moreover, the period in which the experiment was conducted was too short, so the validity and reliability of the experiment's results must be considered carefully. In addition, Wang (2023) proposed a teaching model using Quizlet to assist medical majors students in learning medical English vocabulary, i.e., the teacher creates a word set for each unit on Quizlet, the students select the word set for learning according to their interests or needs, and the teacher can check the students' learning at any time through the teacher's version of Quizlet, as well as communicating with the students and giving them feedback. Wang (2023) pointed out that teachers play the roles of sharing learning resources, organizing online communication activities, and communicating emotions in the teaching mode of using Quizlet for college English. Although Wang (2023) proposed a teaching model that applies Quizlet to vocabulary learning, she did not conduct an empirical study, so it was only the author's assumption. It was impossible to determine whether Quizlet could enhance vocabulary learning or whether the students could accept Quizlet as a vocabulary

learning tool. Therefore, further study is needed to verify the effects of the teaching mode with Quizlet and to investigate whether learners also accept Quizlet as their vocabulary learning tool.

There have also been studies in China on using Quizlet for other foreign language learning (Liu, 2022) or using Quizlet as a vocabulary learning tool for Chinese language learning (Gao, 2023). For example, Liu (2022) investigated a French vocabulary teaching model based on the Quizlet for second foreign languages and conducted a 16-week teaching practice with 136 French learners as participants. The results found that the students generally held a positive attitude towards using Quizlet for French vocabulary learning. However, the study is not empirical; there is no test or description of how the data were collected, so it is difficult for other similar researchers to refer to the study for data collection and analysis of the results. Gao (2023) used observation and interview methods to study the advantages and disadvantages of using Quizlet to assist Russian international students in learning Chinese vocabulary. Gao (2023) pointed out the advantages and disadvantages of using Quizlet to learn Chinese. For example, the advantages include a simple interface, easy operation; fun and educational, comprehensive training in listening, speaking, reading, and writing; mutual learning and sharing of vocabulary cards; intelligent practice function; online group competition mode; and the ability to choose pictures and upload audio when making learning sets. The disadvantages of Quizlet are that there are problems of poor network connection, unstable network conditions, flashbacks, and inability to load the interface; it is not possible to arrange exercises according to the level of the learner; it is not possible to provide a natural writing environment. Chinese characters are ideographs with complex strokes and stroke order, and essential radicals need to be memorized individually, so it is not possible for learners to learn Chinese

characters by using Quizlet. The learners cannot practice the strokes, stroke order, and radicals of Chinese characters by using Quizlet, and they cannot clarify the structure of Chinese characters through actual writing, so this form of practice cannot help learners practice writing Chinese characters; it is not easy to show the abstract vocabulary. Gao's (2023) study group is foreigners learning Chinese, and the results of the study are very informative for Chinese language teaching, but because Chinese and English do not belong to the same language system, the effect of Quizlet for Chinese college EFL learners' college English vocabulary learning needs further empirical research.

In conclusion, it can be learned that much research on digital game-based vocabulary learning has been carried out in China (Gao, 2023; Liu, 2022; Li et al., 2020; Wang, 2023; Yuan, 2023). Compared with the widely used vocabulary learning software in China, such as Baicizhan, Momo, Bubeidanci, Fanbay, etc., which are designed for test-oriented, Quizlet allows teachers and students to create the vocabulary learning content according to their own needs and is more convenient for combining college English vocabulary learning with digital game-based learning. However, most of the vocabulary learning research on Quizlet in China focuses on business English major students (Li et al., 2020) or medical major students (Wang, 2023) or focuses on Quizlet as a learning tool for other foreign languages (Gao, 2023; Liu, 2022). Although Yuan (2023) explored the application of a game-based learning method in College English 1, the students in that study were undergraduates, not college EFL learners, and that is not an empirical study. The interviews only involved students' liking or disliking of using Quizlet. There are few empirical studies in China that have focused on using Quizlet in college EFL learners' college English vocabulary learning. Therefore, to fill this research gap and to explore more effective ways of learning and teaching English vocabulary in college

English courses in the future, this study concentrated on college EFL learners and investigated the effects of using Quizlet for vocabulary learning in college English courses and their perceptions of using Quizlet.

2.4 Digital game-based Vocabulary Learning

Acquiring and using English vocabulary in productive skills like writing and speaking can make learning the language tiresome, as it necessitates memorization and repetition. However, rote memorization and vocabulary repetition can be fun with game-based vocabulary teaching and learning (Waluyo & Bucol, 2021). To meet English vocabulary goals, boost motivation and interest in the subject matter, and promote active learning and flow experiences, digital game-based learning techniques can be employed in EFL learning environments (Ng et al., 2022; Ryu & Parsons, 2012). Additionally, digital game-based learning helps English language learners develop an interest in learning, which increases their motivation to learn the language. It also helps these learners feel less anxious about learning the language. Additionally, according to Wu and Huang (2017), digital game-based learning can improve students' focus, curiosity, inventiveness, and sense of community.

2.4.1 Effectiveness of Game-based Vocabulary Learning

Most of the research used experimental research design to verify the effectiveness of the game-based vocabulary learning approach. For example, Rabu and Talib (2017) conducted a quasi-experimental study to investigate the effectiveness of digital game-based vocabulary learning on fourth-grade primary school students in Malaysia. They found that the students who experienced digital game-based vocabulary learning demonstrated better

English vocabulary learning performance than those taught using the interactive multimedia learning method.

Similarly, Ebrahimzadeh and Alavi (2017) conducted an experimental study and recruited 241 male students randomly divided into three treatments. One is the group where learners learn vocabulary through intensive reading. In this group, learners learned vocabulary through playing a digital video game; one is the group where learners learned vocabulary by watching two classmates playing the video game. The findings indicated that the digital game learning group participants exhibited superior performance compared to those in the intensive reading group in terms of both short- and long-term vocabulary retention. The findings also demonstrated that the acquisition of vocabulary through engagement with digital video games can effectively facilitate learning both simple and compound nouns. The results of this study suggest that integrating digital games in the classroom can facilitate vocabulary acquisition and enhance long-term retention of vocabulary knowledge among students.

In addition, Letchumanan et al. (2015) conducted a quasi-experimental study with the aim of examining the impact of various computer-based and paper-based game techniques on the attainment of English vocabulary. The findings of the study indicate that both approaches demonstrate efficacy. However, the participants with the digital game-based treatment show more significant improvement than the paper-based learning method; in other words, the digital game-based vocabulary learning method is more effective than the paper-based learning method. Moreover, Rabu and Talib (2017) conducted a quasi-experimental study to investigate the effectiveness of digital game-based vocabulary learning on fourth-grade primary school students in Malaysia. They found that the students

who experienced digital game-based vocabulary learning demonstrated better English vocabulary learning performance than those taught using the interactive multimedia learning method. A similar study conducted by Hasram et al. (2021) to determine the effectiveness of online games on the vocabulary learning of primary school students in Malaysia, and the results showed a significant improvement in student's vocabulary scores after using an online game as supplementary material.

In the context of China, Li (2021) conducted a quasi-experiment to investigate the vocabulary performance of game-based vocabulary learning. In his study, the experimental group consisted of 35 students (game-based learning approach) and 35 (paper-based wordlist learning approach) in the control group. The vocabulary learning application, Baicizhan, was used by experimental group learners, and students were required to learn about 15 words every morning for 50 days. The results showed that students using the game-based vocabulary learning approach performed better than those using the paper-based vocabulary learning approach. However, the study aimed to facilitate Chinese college EFL students' CET-4 vocabulary learning, and the vocabulary content was all related to CET-4, which was unrelated to students' college English course classroom learning.

Similarly, Huang et al. (2017) conducted an experimental study to examine the performance of mobile game-based vocabulary learning. In this study, a free mobile app, Super Word King, was used for vocabulary learning, and 100 freshmen from a private university in northern Taiwan participated in the experiment. The results showed that the students who learned the vocabulary with the Super Word King mobile application showed positive vocabulary learning performance. However, the application's design used in the

study is to prepare for the Taiwan General English Proficiency Test, and the context learned on the application is separate from classroom learning. Furthermore, Chen and Hsu（2019）recruited 66 university EFL students to participate in a game-based vocabulary learning experiment, and the results showed a statistically significant improvement in students' vocabulary.

Whether the effectiveness of game-based vocabulary learning differs depending on the gender of the learners, different researchers draw different findings. Huang et al. (2017) conducted an experimental study to examine the performance of mobile game-based vocabulary learning and found no significant difference in learning improvement between male and female students nor between the three different faculties. However, the contrary result was found in Sundqvist and Wikström's (2015) study, which investigated the effect of digital gameplay outside of school on vocabulary outcomes. The results showed that the most frequent groups achieved the highest scores on all vocabulary measures, and boys outperformed girls in terms of vocabulary achievement, with the boys who played digital games much more than the girls; in other words, the boys benefited from their investment in gaming time. It was also confirmed by Vahdat and Behbahani (2013), who investigated the effects of digital game-based vocabulary learning through an adventure genre digital game called: A Road Adventure. The results showed that all participants in the experimental group, both male and female, outperformed all participants in the control group. It is suggested that those who learned new English vocabulary via video games outperformed those who learned it traditionally. The other finding was that the performance of males was better than the performance of females; there is a significant effect of gender on vocabulary learning via video games. Whereas Hsu et al. (2017) found

that girls achieved significantly better English vocabulary learning in the game apps with weak game design factors.

In conclusion, the results of the previous studies show that digital game vocabulary learning is overall effective for vocabulary learning. Furthermore, many other empirical studies (Ali Mohsen, 2016; Baker & Nosratirad, 2013; Benoit, 2017; Ghafar & Noor, 2017; Ibrahim, 2019; Rasti-Behbahani & Shahbazi, 2022; Vahdat & Behbahani, 2016; Xiao & He, 2023) also confirmed that digital game-based vocabulary learning is effective for vocabulary learning. However, the studies above did not show the effectiveness of a digital game-based vocabulary learning approach for acquiring receptive and productive vocabulary knowledge. The next section of the study discussion on this part is detailed.

2.4.2 Effectiveness of Digital Game-based Vocabulary Learning Regarding Receptive and Productive Vocabulary Knowledge

Receptive and productive vocabulary knowledge acquisition is one of the crucial parts of vocabulary knowledge acquisition. Various researchers have empirically investigated whether the digital game-based vocabulary learning approach is practical for receptive and productive vocabulary learning. For example, Janebi and Haghighatpasand (2019) investigated the contribution of an adventure video game to Iranian EFL students' receptive and productive vocabulary recall. The participants were 30 first-year undergraduate students majoring in English literature selected based on a convenience sampling method. Participants were assigned to an experimental group and a control group of 15 participants, each randomly. The experiments took place over five consecutive days, each lasting approximately two hours. The results showed that playing adventure video games contributed to receptive and productive vocabulary recall.

Similarly, Rasti-Behbahani and Shahbazi (2022) conducted an experimental study with 62 Persian EFL learners in the control group and 62 in the experimental group; learners used a digital game in the experimental group and a regular vocabulary learning task in the control group. The results showed that the participants in the experimental group acquired receptive and productive knowledge of different aspects and scopes of the target words more efficiently than participants in the control group; that is, the digital game-based learning task was more effective than the regular vocabulary learning task. The results also showed that the digital game-based vocabulary learning task effectively enhanced the acquisition of productive recognition of form-meaning. Furthermore, the study of Bakla and Çekiç (2017) also showed that digital flashcards were helpful in increasing receptive lexical knowledge and acquiring productive knowledge.

In addition, Son (2018) conducted a study involving a sample of 43 Korean middle school students to examine the impact of digital game-based vocabulary learning on learners' attitudes toward utilizing digital games as a means of vocabulary acquisition. The 43 participants were allocated into two groups: the experimental group, where individuals acquired vocabulary through digital games, and the control group, where vocabulary was learned through traditional vocabulary learning activities. The duration of the experiment spanned two months, during which participants engaged in 30 minutes of weekly vocabulary learning sessions. These sessions occurred a total of eight times throughout the experiment. The findings indicated that the experimental group exhibited marginally higher scores in receptive and productive vocabulary knowledge than the control group. Nevertheless, no statistically significant difference was observed between the control and experimental groups.

However, different findings were found in the study of Ali Moshen (2016), who conducted an experimental study on game-based vocabulary learning and found that game-based vocabulary learning can effectively promote receptive vocabulary learning. However, the study did not include the effectiveness of productive vocabulary learning. Moreover, Vahdat and Behbahani (2013) also investigated the effectiveness of video games as a new tool for EFL vocabulary learning in Iran. They showed that participants in the experimental group (using a digital game-based vocabulary learning approach) acquired receptive form-meaning knowledge more effectively than those in the control group who learned through text and drill exercises. The relationship between playing games and English vocabulary was investigated by Sundqvist (2019), who adopted a quantitative, mixed methods approach and found a significant positive correlation between playing time and test scores on receptive and productive vocabulary tests. The playing time is closely related to productive and receptive vocabulary knowledge learning effects; the frequent gamers scored the highest on both productive and receptive vocabulary knowledge tests.

In summary, the utilization of digital game-based methods for vocabulary acquisition proves to be a viable strategy for both receptive and productive vocabulary learning. However, the extent to which this approach is advantageous for the acquisition of receptive vocabulary knowledge or productive vocabulary learning remains inconclusive due to inconsistent findings. Additional empirical research is warranted to explore the efficacy of utilizing digital game-based methods for the acquisition of receptive and productive vocabulary knowledge.

2.4.3 Merits of Digital Game-based Vocabulary Learning

The effectiveness of digital game-based vocabulary learning has been verified by much empirical research (Chen & Huang, 2019; Hsu, Chen & Cao, 2017; Huang et al., 2017; Ibrahim, 2019; Li, 2021; Rabu & Talib, 2017; Rasti-Behbahani & Shahbazi, 2022; Son, 2018). Moreover, other research also found that Game-based vocabulary learning is effective in improving vocabulary knowledge performance and can facilitate engagement and autonomy. For instance, Ibrahim (2019) conducted a case study on game-based English vocabulary learning; data were collected from game journals, interviews, observations, and think-aloud protocols. The finding showed that game-based vocabulary learning enhances engagement and autonomy. Hasram et al. (2021) found that students learn vocabulary via online games and promote engagement through repetition, contributing to a deeper understanding of vocabulary and the ability to recall spelling easily. Li (2021) also found that motivation and self-confidence were improved with the game-based vocabulary learning approach.

Wu (2018) also created a vocabulary practice system for English that is based on a mobile game. It mimics the well-known block elimination game and combines test items based on article, difficulty, and teacher model in accordance with curriculum requirements and objectives. Additionally, a 7-week quasi-experimental study was conducted in which 30 first-year university students were divided into traditional groups and 32 first-year students into game-based groups. The purpose of the study was to determine whether learners' motivation to learn English could be increased and whether learners' English vocabulary proficiency could be improved using a mobile game-based English vocabulary practice system.

Similarly, Chen (2017) conducted an experimental study to investigate game-based instruction on students learning motivation and achievement in Taiwan; 326 students from 3 top universities participated in the study to study 3 hours per week for 16 weeks. The results showed that game-based instruction could improve students learning motivation and achievement in a short period. The study also showed that some students might withdraw when frustrated, but their problem-solving skills would significantly improve.

In addition, Wu and Huang (2017) conducted a quasi-experiment to investigate the effectiveness of a mobile game-based English vocabulary practice system, which was developed to increase motivation and interest in English learning. Ninety-four first-year students from a private university in Taiwan were divided into three groups, and the experiment lasted for 18 weeks, with pretests and posttests administered before and after the game-based vocabulary learning intervention to assess English learning achievement. The study results showed that the mobile game-based vocabulary learning system could enable students to practice and review vocabulary in a relaxed and enjoyable learning environment. The results also showed that the game-based learning method increased students' attention and interest and gave them a sense of achievement and triumph. Moreover, feedback was one of the most crucial game design factors in the game-based English vocabulary learning applications, as feedback gave the participants confidence, which motivated them to play the game for a long time (Hsu et al., 2017).

Digital game-based vocabulary learning is also beneficial for listening and pronunciation, as learners can automatically learn vocabulary pronunciation as many times as they want (Son, 2018). Digital game-based vocabulary programs have different modes of presentation, such as pictures, and pronunciation of words could significantly contribute

to vocabulary learning (Janebi & Haghighatpasand, 2019). Additionally, Li et al. (2021) discovered that vocabulary learned through digital games has a positive impact on concentration after studying the flow experiences of Chinese EFL learners.

2.4.4 Perceptions on the Use of Game-based Vocabulary Learning

Learners' perceptions of digital game-based vocabulary learning have important implications for whether this approach benefits students and whether teachers should use such a vocabulary learning tool in the classroom. From the existing research on digital game-based vocabulary learning, the digital game-based vocabulary learning method is an exciting resource for students to learn vocabulary more fun and effectively (Ghafar & Noor, 2017). The results of Rabu & Talib (2017) on the acceptance of learning showed that the participants agreed that digital game-based learning could be beneficial for continuous use, and they showed a high level of acceptance towards using digital games in the classroom. Participants would like teachers to use digital game-based learning strategies in the classroom. The results also showed that some students prefer to use applications other than digital games outside the classroom; despite that, it is easy for them to use digital game-based vocabulary learning methods and support that digital game-based vocabulary learning is beneficial in helping to improve their English vocabulary.

Similarly, Janebi and Haghighatpasand (2019) investigated the contribution of an adventure video game to Iranian EFL students' receptive and productive vocabulary recall. They explored their perceptions of the game as a supplementary learning tool. The EFL learners positively perceived the game and identified games as helpful for language learning. Furthermore, Son (2018) investigated learners' attitudes toward using digital games to learn vocabulary. After two months with eight times of vocabulary learning,

learners showed positive attitudes toward learning vocabulary using a digital game-based vocabulary learning program. Wu (2018) demonstrated that students who utilized the game-based vocabulary practice system were able to focus and stay interested in the material, and the game-based group also reported higher levels of motivation for learning.

Furthermore, Chen and Hsu (2019) recruited 66 university EFL students to participate in a game-based vocabulary learning experiment. All participants completed a pre-and posttest before and after the experiment. A user survey also investigated the students' perceptions of serious game-based vocabulary learning. The findings showed a statistically significant increase in student vocabulary, and participants reported enjoying learning vocabulary through the game. The results also showed that repeated exposure to words was beneficial for vocabulary acquisition, with participants gaining more vocabulary when words occurred more than six times. Webb (2007) also found that when learners encounter a word repeatedly, they are equipped with productive vocabulary knowledge.

Although many empirical studies have examined digital game-based vocabulary, learners' perceptions towards the use of digital game-based vocabulary learning are generally positive. However, most vocabulary learning app designs examine utilitarianism as guidance; the vocabulary words text without contextual processing, the word list does not match the daily classroom teaching, and the online content accessible disconnects with the classroom teaching. The input is limited vocabulary and then affects the level of learners' vocabulary acquisition (Li et al., 2020). Therefore, it is valuable to conduct further research on the perceptions of learning pertaining to the use of digital game-based

vocabulary learning applications. This will aid with improving the efficacy of digital game-based vocabulary learning for both learners and instructors.

2.5 Quizlet-based Vocabulary Learning

Quizlet, a digital game-based vocabulary learning tool, has been used widely in many countries. In 2005, Andrew Sutherland created a learning tool to help him pass the vocabulary test. He achieved excellent results and shared the tool with his friends, who also began to achieve excellent test results. More than ten years later, 50 million students use Quizlet every month for all their learning needs, including math, medical, and English vocabulary tests (Quizlet, 2023).

2.5.1 Features and Functions of Quizlet

Quizlet is an online digital flashcard for vocabulary learning that provides many words sets on a wide range of topics. It allows learners to create, use, share, and re-create vocabulary flashcards, and users can search within Quizlet for target words created by other people. Learners also have access to quizzes and games to further their vocabulary learning. Quizlet's features are divided into two main areas, Study and Play. The study features can be divided into five features (Learn, Flashcard, Write, Spell, Test), and the play features can be divided into three features (Match, Gravity, Live). The description of each feature is shown in the following Table 2.1.

Table 2.1: The description of learning modes in Quizlet

Learning mode	Description	Website	Smartphone
Study	Words and their meanings can be learned through multiple-choice and writing questions. Questions are sorted from easy to difficult.	Available	Available

Table 2.1 Continued

Flashcard	Digital flashcards demonstrate terms that the students can flip using mouse clicks or touch screens to show definitions or pictures that explain the term.	Available	Available
Write	Students are asked to write the definitions for the terms, or the pictures exposed. They can retake this module if they make an error.	Available	Available
Spell	Students are asked to type what they hear from the audio prompt. If they misspell the word, they will hear it dictated letter by letter while the correct answer is typed on the screen.	Available	Non-Available
Test	A test consists of four questions: written, multiple choices, matching, and True or False. The questions are based on the study set. The scores gained, and the correct answers for the mistaken ones can be checked.	Available	Available
Match	A game in which learners are asked to match terms to their definitions (or the corresponding pictures) as quickly as possible. After finishing it, the app shows them their scores and ranks among other learners.	Available	Available
Gravity	In this game, students are asked to type the term corresponding to its definition before the asteroid falls and crashes onto the planet.	Available	Non-Available
Live	Four or more students are required to play this module in which they are connected to http://Quizlet.com/live, and they are asked to enter the unique session code. After that, the students in each group should answer multiple-choice questions based on the study through their computers. They must collaborate to get the correct answers because the answers are randomly scattered among the devices. The winner is the first group that finishes the game.	Available	Non-Available

Source: adopted from Setiawan & Wiedarti, 2020, p.87

Quizlet's interface is attractive and intuitive, requiring little setup or computer knowledge to learn new words (Ashcroft et al., 2018). Instructors are able to set up a Quizlet virtual class and extend an invitation to students to join. Two types of vocabulary sets have been provided by Quizlet, one being ready-made flashcards and the other being

user-created. Bilová (2018) pointed out that there are several ways to work with vocabulary sets: using Flashcard to learn words, using the Learn module to check progress, using the Spell module to spell the word you hear, using the Test module to take randomized practice tests, the Match and Gravity modules can be used to play games for review.

2.5.2 Effects of the Use of Quizlet

Quizlet is a free website, accessible on computers and mobiles, which provides several modes for learners to learn vocabulary, including game modes. This user-guided online program provides a variety of learning activities and games to assist students in practicing and mastering the material either individually or in a group setting (Okkan & Aydin, 2020). The effectiveness of Quizlet has been examined by many researchers (Ali & Kassel, 2018; Barr, 2016; Bueno-Alastuey & Nemeth, 2020; Cinar & Ari, 2019; Crandell, 2017; Davie & Hilber, 2015; Dewi, 2023; Dizon, 2016; Dreyer, 2014; Körlü, 2017; Korlu & Mede, 2018; Lander, 2015; Okkan & Aydin, 2020; Pham, 2018; Sanosi, 2018; Susila, 2023). In these studies, it is stated that Quizlet facilitates vocabulary learning; the learners who used Quizlet to learn vocabulary outperformed those who did not use Quizlet. The researchers conducted empirical studies to investigate the effectiveness of Quizlet in different contexts and used different research designs, the tests used in their studies were also different depending on the researcher.

2.5.2.1 Research in different context

Numerous studies on the efficacy of paired-associated learning tasks have revealed that many words can be memorized quickly (Fitzpatrick et al., 2008; Nation, 1980).

Quizlet is a digital tool that facilitates vocabulary acquisition using flashcards in a paired-association format (Nakata, 2011). Quizlet, as a vocabulary learning tool, has piqued the interest of numerous researchers from around the world. These researchers carried out empirical studies to investigate the effect of Quizlet on vocabulary acquisition.

In Thailand, Waluyo and Bucol (2021) found that Quizlet as a game-based vocabulary learning tool positively impacted low-proficiency university students' vocabulary learning outcomes, as measured by vocabulary test scores. In their study, Quizlet was designed to help students learn vocabulary at home, as more than class time is usually needed to cover all the words students need to learn and acquire in order to be able to understand and communicate in English. In the context of Japan, Ashcroft et al. (2018) compared the effectiveness of Quizlet and paper flashcards; Barr (2016) examined to evaluate the efficacy of Quizlet as a pedagogical tool for enhancing vocabulary acquisition, and thirty-two low-level first-year university students participated in a Quizlet-based vocabulary study.

In the Vietnam context, Nguyen and Van Le (2023) in Vietnam examined Quizlet's impact on enhancing vocabulary skills among EFL learners in a private educational institution. Fifty-nine undergraduate students were allocated into a control group and an experimental group. The control group avoided utilizing Quizlet during class sessions, whereas the experimental group engaged in weekly vocabulary learning revisions using Quizlet. The findings indicated a statistically significant difference in students' performance between the experimental and control groups, and the experimental group performed better than the control group. Tran and Le (2023) conducted a study to examine Quizlet's impact on enhancing secondary school students' English vocabulary proficiency.

The results of their investigation revealed that Quizlet exhibited a gradual improvement in students' vocabulary acquisition.

In Turkey's context, a study by Ersoy Özer and Koçoğlu (2017) examined the impact of Quizlet and traditional note-taking methods on vocabulary acquisition. The findings indicated that the group utilizing Quizlet exhibited marginally superior outcomes compared to the group utilizing vocabulary notebooks and notably superior outcomes to the control group regarding overall vocabulary acquisition and retention. Atalan (2023) conducted a study to investigate the efficacy of Quizlet in augmenting vocabulary acquisition among EFL learners. Furthermore, the researcher investigated the participants' perspectives on the utilization of Quizlet as a method to augment vocabulary acquisition and improve pronunciation abilities. The study results revealed that both the experimental and control groups enhanced their vocabulary test performance. Nevertheless, the analysis yielded no statistically significant disparity between the experimental and control groups.

Furthermore, Aksel's (2021) research demonstrated that Quizlet was effective in enhancing vocabulary acquisition among undergraduate students at an intermediate level. Sanosi (2018) investigated the efficacy of Quizlet as a tool for improving English vocabulary acquisition in the context of Saudi Arabia. The study's findings revealed a significant improvement in learners' vocabulary learning when using Quizlet as a means of vocabulary acquisition. Setiawan and Wiedarti (2020) conducted a study in the Indonesian context to investigate the efficacy of using the Quizlet application to increase students' motivation in vocabulary acquisition. The study's findings revealed that using the Quizlet application significantly increased students' motivation to learn vocabulary when compared to students who did not use Quizlet. The use of Quizlet during vocabulary

learning sessions was found to increase students' enthusiasm, resulting in a notable absence of boredom. As a result of this increased level of engagement, there was a significant increase in interest in vocabulary acquisition via Quizlet.

In the Korean context, An (2018) study that looked into the impact of Quizlet on Korean language learners discovered that those who used Quizlet scored higher than those who did not, and those who used Quizlet showed a high degree of satisfaction and interest in using Quizlet to learn vocabulary. The subjects also showed that they liked the Match module the most because it is interesting, saves time, shows the time used, and through doing this module, learners can know their learning effect. Moreover, Jeong et al. (2018) compared the effects of English vocabulary learning using Quizlet and Class Card, showing that vocabulary improvement was statistically significant only in the Quizlet group.

Furthermore, in the Spain context, Montaner-Villalba (2019) found that students' vocabulary acquisition improved significantly after using Quizlet as a vocabulary learning tool. In their study, Bueno-Alastuey and Nemeth (2020) conducted a comparison between two online tools for vocabulary learning, namely Quizlet and podcasts. The researchers found that both applications proved to be effective in facilitating the acquisition of receptive and productive vocabulary knowledge. The results also showed that both the Quizlet and Podcasts groups scored higher on the receptive posttests than on the posttests measuring productive vocabulary knowledge. In addition, Mykytka (2023) conducted a study to investigate the efficacy of Quizlet in enhancing vocabulary acquisition among EFL students who are native Spanish speakers.

In the Chinese context, Chien (2015) conducted a comparative analysis of the efficacy of three online vocabulary flashcard platforms, namely Quizlet, Study Stack, and Flashcard Exchange. The study revealed that all three online vocabulary websites were found to be beneficial for learners; however, participants expressed a preference for Quizlet. Zhao (2020) took action research on gamification teaching of Chinese with Kahoot! and Quizlet found that students prefer to use Quizlet first; Quizlet can increase the fun of learning, mobilize the classroom atmosphere, and significantly improve students' scores and Chinese vocabulary memory accuracy. Furthermore, the impact of Quizlet on academic vocabulary acquisition was examined by He et al. (2023) in a study involving 41 engineering undergraduates enrolled at a prominent university. In the study, Wang et al. (2023) examined the impact of incorporating Quizlet into acquiring Chinese vocabulary. Their findings revealed a noteworthy enhancement in students' performance on standardized assessments of Chinese reading and listening skills.

Although, the aforementioned studies were conducted in various contexts, the findings of these studies indicate that Quizlet demonstrates efficacy as a tool for vocabulary acquisition. It is effective for English vocabulary learning and other language vocabulary acquisition; for example, An (2018) found that Quizlet was effective for Korean language learners to learn Korean vocabulary. However, few empirical studies were conducted in the Chinese context to examine the effects of Quizlet as a College EFL learners' English vocabulary learning tool.

2.5.2.2 Research among different level participants

Quizlet, as one of the most popular game-based vocabulary learning applications with different vocabulary exercise modes, was used worldwide, and the effectiveness of

Quizlet also has been examined among different level learners. Most research focused on the university students' vocabulary learning performance with the Quizlet as the learning tool (Ashcrof, Cvitkovic & Praver, 2018; Barr, 2016; Cha & Kim, 2016; Chaikovska & Zbaravska, 2020; Dewi, 2023; Jeong & Park, 2018; Korkealehto & Siklander, 2018; Köse, Yimen & Mede, 2016; Waluyo & Bucol, 2021). The studies mentioned above have demonstrated the effectiveness of Quizlet as a tool for vocabulary acquisition, as it has the potential to improve learners' performance in terms of vocabulary knowledge. For instance, the participants of Waluyo and Bucol (2021) were low-proficiency university students, and the participants used Quizlet to learn vocabulary at home; the test scores showed that Quizlet positively impacted their vocabulary learning. Barr (2016) took university-level students as participants to examine Quizlet's effectiveness as a vocabulary learning tool.

Similarly, Ashcroft et al. (2018) divided the university English learners into three English proficiency levels (beginner, intermediate and advanced) to investigate any difference in the effect of using Quizlet compared to paper flashcards and to examine whether the students' English proficiency level also influenced the effectiveness of the two study modes. The results also showed that the elementary and intermediate groups achieved significantly higher immediate gains when using Quizlet than paper flashcards. However, for the advanced group, there was no significant difference in immediate gains between digital and paper flashcards. For the elementary group, delayed gains were significantly higher for Quizlet than for paper. Nevertheless, there was no significant difference for the intermediate group in the delayed test for using Quizlet and paper flashcards.

In a similar vein, Ashcroft et al. (2018) conducted a study wherein university English learners were categorized into three distinct levels of English proficiency (beginner, intermediate, and advanced). The purpose of this study was twofold: first, to explore potential disparities in the impact of utilizing Quizlet as opposed to traditional paper flashcards; and second, to assess whether the students' level of English proficiency influenced the efficacy of these two modes of study. The findings also indicated that the elementary and intermediate cohorts demonstrated significantly greater immediate improvements in learning outcomes when utilizing Quizlet as compared to traditional paper flashcards. Nevertheless, when considering the advanced group, there was an absence of a statistically significant disparity in immediate gains observed between the utilization of digital and paper flashcards. Significant differences in delayed gains were observed between the elementary group's performance on Quizlet and paper-based learning materials. However, there was no statistically significant disparity observed in the delayed test performance between the intermediate group utilizing Quizlet and those employing paper flashcards.

In addition, Jeong and Park (2018) conducted a comparative analysis to examine the impact of two distinct smartphone vocabulary applications, namely Quizlet and Classcard, on the vocabulary attainment of university students. One cohort engaged in the vocabulary task utilizing the online learning platform Quizlet, while the other cohort completed the identical vocabulary task employing the online learning platform Classcard. The study demonstrated that Quizlet and Classcard are effective tools for enhancing vocabulary acquisition. Nevertheless, there was a statistically significant increase in vocabulary improvement observed solely in the Quizlet group, while no such increase was observed in the Classcard group. Furthermore, the study conducted by Köse et al. (2016)

examined the impact of Quizlet on the enhancement of vocabulary skills among Turkish EFL learners who were enrolled in a preparatory program at a private university. The findings of the study indicate that a majority of students perceive Quizlet as a valuable tool, especially in the early phases of vocabulary acquisition. This perception is based on the ability of Quizlet to facilitate learning by providing definitions, synonyms, and pronunciation of target words through repetitive practice.

Nevertheless, it is important to note that not all empirical studies have yielded consistent results regarding the usefulness of Quizlet in enhancing university students' vocabulary knowledge performance. For instance, Davie and Hilber (2015) conducted a study to examine the impact of Quizlet on undergraduate engineering students' English vocabulary learning at the South Westphalia University of Applied Sciences. Based on the findings of the interview analysis, it was determined that students perceive mobile-learning flashcards as a highly effective, convenient, and enjoyable approach to learning. However, upon comparing the vocabulary scores obtained from the examinations conducted in the two most recent semesters, no statistically significant disparity in student performance was observed.

Multiple research investigations have been undertaken to examine the efficacy of Quizlet in enhancing vocabulary acquisition among students at the foundational level. In a study conducted by Al-Malki (2020), the impact of Quizlet on the acquisition of vocabulary was examined among students enrolled in the English Language Foundation for Foreigners program at Rustaq College of Education in the Sultanate of Oman. The students in the foundation program were provided with Quizlet study sets that encompassed specific topics aligned with their prescribed curriculum. During this process,

they acquired a wide range of vocabulary both through individual study and collaborative efforts. The findings indicated a notable improvement in the performance of the foundation students in terms of vocabulary acquisition.

Furthermore, in a study conducted by Korlu and Mede (2018), two intact classes consisting of 40 students were enrolled in a language preparatory program at a foundation university. The purpose of the study was to assess the effectiveness of Quizlet and a vocabulary notebook in enhancing learners' vocabulary acquisition. The findings indicated that both groups demonstrated significant improvement in terms of their vocabulary acquisition throughout the duration of the study. While the utilization of a vocabulary notebook did result in a modest improvement in students' vocabulary learning performance, the disparity in effectiveness was significantly greater for the Quizlet group. This suggests that Quizlet proved to be a more beneficial tool for both learning and reviewing target words.

According to a study conducted by Özer and Koçoğlu (2017), the utilization of Quizlet among high school students resulted in enhanced vocabulary test scores for both the group using flashcard software and the group using vocabulary notebooks. The group utilizing Quizlet demonstrated marginally superior outcomes compared to the group utilizing vocabulary notebooks, and notably superior outcomes compared to the control group in terms of vocabulary acquisition and retention. Additionally, the study conducted by Dreyer (2014) investigated the impact of Quizlet usage on the vocabulary test scores of students enrolled in a language arts class at an urban high school. The findings of the study revealed that students who utilized Quizlet consistently achieved higher scores on their weekly vocabulary tests compared to students who did not use Quizlet.

Several research studies have specifically investigated Quizlet's efficacy as a tool for middle school students to improve their vocabulary acquisition. These studies have shown that using Quizlet as a learning platform is effective in facilitating vocabulary learning among this specific demographic. For example, Cho (2021) investigated the impact of using Quizlet as a means of assessing English performance among middle school students. The researcher conducted a study in two phases to implement performance assessment as a variable. In the first stage, the researcher studied the effect of using Quizlet according to their autonomy on 52 middle school students. During the subsequent phase, the identical group of students evaluated the impacts and perceptions of performance assessment utilizing Quizlet. The findings indicated a significant enhancement in the participants' overall performance on the vocabulary test. Moreover, it was observed that the students exhibited more progress during the second phase compared to the initial phase.

The study conducted by Cinar and Ari (2019) aimed to examine the impact of the Quizlet online vocabulary application on both vocabulary learning skills and attitudes toward English courses. The study group comprised a total of 71 ninth-grade students who were enrolled in educational institutions located in Eskişehir. Data was collected using a vocabulary test. A total of eight instructional sessions were administered to both the experimental and control groups over a duration of four weeks. The experimental group's posttest vocabulary and memory scores exhibited a statistically significant increase compared to those of the control group. The results of the retention test for the experimental group demonstrated a significantly higher score when compared to the posttest. Conversely, the control group exhibited a statistically significant decrease in performance.

Some research studies utilize vocational students as participants in order to examine the impact of Quizlet on their acquisition of vocabulary. In a study conducted by Ersoy Özer and Koçoğlu (2017) in Turkey, a comparison was made between the impact of Quizlet and traditional notebook usage on vocabulary acquisition. Eighty-nine vocational high school students from 4 classes were participants, one class learning vocabulary with Quizlet, one class learning vocabulary with a notebook, and two other classes with no treatment. Pretests, posttests, and delayed posttests were administered to assess the achievement of vocabulary learning. The findings indicated that the group utilizing Quizlet demonstrated slightly superior outcomes compared to the group using vocabulary notebooks, and significantly superior outcomes compared to the control group in terms of overall vocabulary acquisition and retention.

The above studies were conducted with different levels of learners, such as college students, foundation students, high school students, middle school students, and vocational students, to investigate Quizlet's effectiveness on their vocabulary learning empirically. While most studies have indicated that Quizlet is effective in enhancing learners' performance in vocabulary acquisition, a minority of studies have found that Quizlet does not yield a significant improvement in learners' vocabulary learning performance. Therefore, it is imperative to undertake further comprehensive investigation regarding the efficacy of Quizlet.

2.5.2.3 Tests used in Quizlet-based vocabulary learning research.

Most studies of Quizlet-based vocabulary learning have shown that Quizlet effectively improves students' vocabulary performance (Berliani & Katemba, 2021; Dewi & Rahma, 2022; Montaner-Villalba, 2019; Nguyen & Van Le, 2023; Nhan, 2022; Vu &

Bui, 2023; Senior, 2022; Yahya, 2022; Zakaria et al., 2022). However, the tests used in these studies are not all the same, and the types of questions used vary by researcher. Some studies used the tests only to measure productive vocabulary knowledge performance (Ashcroft et al., 2018), some only measured receptive vocabulary knowledge performance (Vu & Bui, 2023), and some studies did not distinguish the difference between receptive and productive knowledge performance (Chaikovska & Zbaravska, 2020; Cho, 2021).

An experimental study was conducted by Ashcroft et al. (2018) to examine the effects of Quizlet. The study included 139 undergraduate students who were native speakers of Japanese and English. These participants were enrolled at a large university in Japan and were divided into three proficiency levels. The study employed a mixed-methods approach. Given that the authors considered the concurrent enrolment of the students in an English academic writing course, it was deduced that a productive measure of vocabulary aligned with the students' academic requirements would be more appropriate.

The word knowledge was measured using a productive L2 (Second language) measure, which was prompted with the L1 (first language). For example, the L1 prompt was "财政", the prompt was "He studied banking and (f____) at business school". The answer was "finance". Ashcroft et al. (2018) only measured productive vocabulary knowledge, and the type of the test belonged to the productive recall test, according to Webb's (2005) vocabulary knowledge measuring tests. The findings of this study indicate that the utilization of Quizlet yields greater vocabulary acquisition among students at lower proficiency levels compared to the use of traditional paper flashcards. Nevertheless, the highest-performing group of students in this research exhibited comparable levels of

proficiency when utilizing both Quizlet, an online study tool, and traditional paper flashcards.

Cho (2021) investigated the effects of Quizlet-based English performance; the researcher conducted a study in two phases. In the first stage, the researcher studied the effect of using Quizlet according to their autonomy on 52 middle school students. In the second stage, the same students were examined about the effects and perceptions of Quizlet-based performance assessment. The questions in the vocabulary performance test were composed of translation, phrase completion, matching, selection, and sentence completion, a total of 45 questions—the questions on the test need to be more detailed in productive or receptive vocabulary knowledge tests. The findings showed that the vocabulary scores of participants who used Quizlet in a performance assessment environment improved much more than those who used Quizlet freely without supervision. Similarly, Chaikovska and Zbaravska (2020) conducted a quasi-experimental study to examine the possibility of utilizing Quizlet to improve EFL learners' vocabulary acquisition. The test consists of reading and using English, including finding a match, multiple choice, and gap-fill types of tasks. The results showed that students taught through traditional paper notebooks had no better outcomes than those who worked based on the Quizlet platform—the questions on the test need to be more detailed in productive or receptive vocabulary knowledge tests.

In addition, An (2018) conducted an experimental study to examine the impact of Quizlet on the acquisition of Korean language vocabulary among a sample of 28 international undergraduate students. The participants were divided into two groups: an experimental group, which utilized Quizlet as a tool for vocabulary learning, and a control

group, which employed traditional methods for vocabulary acquisition. Each group consisted of fourteen participants, and both groups underwent eight rounds of quizzes to assess their respective levels of performance. The questions used in the quizzes did not distinguish receptive and productive vocabulary knowledge. The results validated the effectiveness of Quizlet vocabulary learning by showing that the experimental group outperformed the control group in eight rounds of testing. Furthermore, Jeong and Park (2018) compared the effects of Quizlet and Classcard on English vocabulary learning. The test consists of three parts, “use”, “meaning” and “spell”, according to Webb (2005); the part of “meaning” belongs to the receptive recognition test, and “spell” questions belong to the productive recall test. However, the receptive and productive vocabulary knowledge performance did not analyse individually.

In contrast, the three components of vocabulary knowledge were integrated for analysis. The findings of the study indicated that Quizlet and Classcard are effective tools for enhancing vocabulary acquisition. However, there was a statistically significant improvement in vocabulary only observed in the Quizlet group, while no such improvement was found in the Classcard group. The study encompassed test questions that assessed both receptive and productive vocabulary knowledge. Nevertheless, the evaluation of the outcomes employed the aggregate scores of all the inquiries to assess the impact of the two applications on vocabulary acquisition, rather than conducting a separate analysis for each section of the assessment.

Furthermore, the study conducted by Bueno-Alastuey and Nemeth (2022) aimed to investigate and compare the impact of two commonly utilized online resources, namely Quizlet and podcasts, on the development of learners’ receptive and productive vocabulary

acquisition. Notably, the study focused on the use of student-created digital flashcards and podcasts. The research employed a two-part test. The initial part aimed to evaluate receptive vocabulary knowledge by requiring students to match 14 words with their corresponding definitions from a provided set of 14 definitions. The subsequent part aimed to assess productive vocabulary acquisition by presenting students with three thought-provoking quotes pertaining to the topic. They were then instructed to compose an opinion essay of approximately 200 words utilizing the given words. The findings indicated that Quizlet proved to be a successful approach for acquiring both receptive and productive vocabulary. The group utilizing Quizlet achieved higher scores in the posttests assessing receptive vocabulary compared to the posttests evaluating productive vocabulary.

Similarly, Cha and Kim (2016) compared the effects of the worksheets and Quizlet on learners' vocabulary learning; a test was used to measure their vocabulary learning performance. There are two distinct sections to the test. The first section consisted of writing the meanings of each word in Korean. The word was given in a sentence format. The following section asked the student to spell an English word. The word was provided in a sentence with the first letter revealed alongside the Korean meaning (e.g., Pepsi and Coca-Cola have very d____ Flavors. 구별되는-형). According to Webb (2005), the first section test measured receptive recall vocabulary knowledge, and the second measured productive recall vocabulary knowledge. However, the authors used the total scores to analyse the vocabulary knowledge performance and did not analyse the two sections individually. Moreover, the findings indicated that the two vocabulary learning methods were effective in learners' vocabulary learning.

Additionally, Köse et al. (2016) investigated the effects of Quizlet; 43 pre-intermediate and intermediate proficiency preparatory students took part in the study. The productive vocabulary knowledge tests quizzes were utilized to gauge the level of vocabulary learning achieved by the students. Students had to use the provided words to write a paragraph for the quizzes. Although there were fifteen target words provided, students still needed to meaningfully use at least ten of them. The findings demonstrated that after using Quizlet, test scores were significantly higher for students in the relatively higher-level group. But after using Quizlet, students in the lower-level group did not see a discernible improvement in their scores.

In conclusion, most previous studies did not distinguish between receptive and productive vocabulary knowledge (Li et al., 2020; Montaner-Villalba, 2019; Sanosi, 2018; Susila, 2023; Tanjung, 2023; Tian, 2020; Waluyo & Bucol, 2021; Yahya, 2022; Zakaria et al., 2022; Zhao, 2020) when using tests to measure vocabulary knowledge performance. Although some studies (An, 2018) measured the vocabulary involved in the receptive or productive vocabulary knowledge performance, they did not further analyse the performance of receptive and productive vocabulary knowledge while putting both test scores together to measure learner performance. Webb (2005) showed that measuring vocabulary acquisition purely through receptive or productive tests can produce misleading results. However, measuring a particular aspect of knowledge through receptive and productive tests may yield a much more accurate assessment of the type and degree of learning that has taken place. Because of this, to evaluate Quizlet's effectiveness as a vocabulary learning tool, more research must be done using productive and receptive vocabulary knowledge performance tests.

2.5.3 Perceptions towards the Use of Quizlet

Quizlet was used word widely, and many researchers worldwide have investigated the studies of perceptions on the use of Quizlet. Multiple studies have indicated that learners exhibit favourable attitudes toward the use of Quizlet as a tool for vocabulary acquisition (Aksel, 2021; Kholis & Nadhif, 2023; Muthmainnah, 2023; Nguyen et al., 2023; Pham, 2022; Ulfa et al., 2023). This positive reception can be attributed to Quizlet's provision of an engaging learning environment, which enhances motivation and attention. Additionally, Quizlet effectively alleviates the monotony associated with vocabulary learning, rendering the process more stimulating for learners (Alimkhanova et al., 2023; Nguyen et al., 2022; Sari et al., 2021; Tanjung & Daulay, 2022; Vu & Bui, 2023). Consequently, learners become more enthusiastic in classroom activities (Aprilani & Suryaman, 2021), leading to heightened effectiveness in vocabulary acquisition (Al-Malki, 2020; Fitri et al., 2022; Nguyen & Van Le, 2023). Furthermore, the use of Quizlet has been found to enhance English vocabulary mastery (Christian & Fortunata, 2023) and foster learner motivation and autonomy (Fadhilawati et al., 2022; Hong & Du, 2021; Nguyen et al., 2022). In addition, as one of the digital vocabulary learning tools, according to the Technology Acceptance Model, the learners perceived the use of Quizlet can be seen from the following aspects.

2.5.3.1 Perceptions on the Actual System Use of Quizlet

According to Arshad et al. (2012), the term Actual system use is used to describe the recurrence of the usage of specific technology tools by learners in EFL context awareness. Not many studies involved the actual system use of Quizlet. However, some studies, as Waluyo and Bucol (2021), mentioned that students' motivation to learn English

is relatively low, which means that providing Quizlet sets and asking students to explore the app independently may not be enough to get students to complete the task, so the teacher should be aware of such circumstances and set up a monitoring system accordingly. According to the findings of Köse and Mede (2016), the utilization of Quizlet was found to have a notable influence on the enhancement of vocabulary skills among B1 (pre-intermediate) students. However, the A2 (elementary) students did not exhibit a comparable level of improvement in their performance, as their engagement with the tool was not as extensive as that of the one mentioned previously.

Similarly, Cho (2021) also found that the vocabulary scores of participants who used Quizlet in a performance assessment environment improved much more than those who used Quizlet freely without supervision. Furthermore, Dreyer (2014) also claimed that some students need study reminders to supervise them in using Quizlet learning vocabulary. Even students might focus on something other than learning vocabulary on Quizlet; as Setiawan and Wiedarti (2020) mentioned, the researchers may encounter some problems during the intervention of Quizlet. For instance, a subset of students exhibited a lack of concentration on vocabulary acquisition via their smartphones, instead engaging in alternative activities. It was observed that certain individuals engaged in the utilization of additional applications, such as Instagram and Facebook, whereas other students opted to employ the Quizlet Application. As a result, the utilization of Quizlet may vary based on the learners' levels of motivation and proficiency.

2.5.3.2 Perceptions on the perceived usefulness of the use of Quizlet

Perceived usefulness refers to the degree to which learners hold the belief that the utilization of a technological tool, specifically, would enhance their EFL learning (Arshad

et al., 2012). In this study, perceived usefulness refers to learners' belief that employing Quizlet in their learning process would reinforce their EFL learning. Many previous studies have investigated the usefulness of Quizlet. For example, Bueno and Nemeth (2022) compared Quizlet and Podcasts, two vocabulary learning tools' effects on vocabulary acquisition. They discovered that learners preferred Quizlet over Podcasts, and nearly all participants thought Quizlet was a valuable and convenient tool for acquiring new vocabulary, as well as user-friendly.

In a similar vein, Van et al. (2020) devised a questionnaire instrument grounded in the Technology Acceptance Model to examine the perceived utility of Quizlet among undergraduate students in Vietnam. Four items were used to measure student perceptions of perceived usefulness. The average scores for all items exceeded 4, indicating a positive perception among students regarding the utility of Quizlet. Furthermore, Meng (2021) and Prayogi et al. (2021) also found that EFL learners hold positive attitudes towards usefulness and enjoyment. Moreover, according to Lander (2015), Quizlet has been suggested as a potential tool for enhancing learners' pronunciation skills. This is attributed to the utilization of an integrated text-to-speech translation feature within Quizlet, which offers a native-like pronunciation for words entered in either the target or base language. Quizlet is additionally linked to a widely used online photo repository known as Flickr, which grants users access to publicly accessible photographs. The integrated tools offer accurate pronunciations and visual aids for any inputted word or phrase. In a similar vein, the study conducted by Korlu and Mede (2018) revealed that learners exhibited a high level of enthusiasm towards the utilization of Quizlet. Furthermore, the inclusion of an audio feature within the platform was well-received by all participants, as it facilitated the acquisition of accurate word pronunciation.

Furthermore, Hikmah (2019) asserted that Quizlet is a valuable tool for improving linguistic abilities, particularly vocabulary expansion. Quizlet allows you to practice all four language skills: listening, speaking, reading, and writing. Individuals can improve their listening skills in the context of language acquisition by listening to audio materials that provide explicit explanations of word spellings. Individuals can also use flashcards to improve their pronouncing skills. In addition, the Match module provides a platform for users to improve their reading skills. Users must correctly spell each answer in the Study, Spell, and Test modules. Furthermore, Korkealehto and Sinklander (2018) discovered that students believed Quizlet had a positive impact on the development of their written and oral language proficiency. Ainiah (2023) discovered that using the Quizlet application was effective in improving the reading abilities of students.

However, not all the learners hold positive attitudes towards the usefulness of Quizlet, as Çeçen (2020) demonstrated that high-level proficiency students had more positive opinions than low-level proficiency students regarding the perceived usefulness of Quizlet. Therefore, Chinese college EFL learners' perceptions of using Quizlet should be further investigated to get a clearer picture of the learners' perceptions of this aspect.

2.5.3.3 Perceptions on the perceived ease of the use of Quizlet

Perceived ease of use refers to how much learners believe using a specific technology tool will be effortless (Arshad et al., 2012). In the study, perceived ease of use refers to how much learners believe using Quizlet will be easy to do. Several studies reported that Quizlet Application was relatively easy to be used (Çeçen, 2020; Christian & Fortunata, 2023; Meletiadou, 2023; Setiawan & Wiedarti, 2020; Sudrajat, 2022). In addition, Lander (2015) reported that participants found Quizlet to be a simple and easy-to-

use learning tool that provided different ways to learn new words, making learning more enjoyable. Kálecký (2016) and Oblinger (2005) Quizlet was also perceived to be fairly easy to use by all participants.

Additionally, the study conducted by Bueno-Alastuey and Nemeth (2022) revealed that a significant majority of participants held the belief that Quizlet possessed considerable value and convenience as a tool for acquiring new vocabulary. Moreover, the respondents expressed their satisfaction with the user-friendly nature of the platform. According to Technology Acceptance Model, Van et al. (2020) designed a questionnaire to investigate the Vietnamese undergraduate students' perception of perceived ease of use of Quizlet. Since the average score for every item was greater than 4, it was clear that students thought Quizlet was easy to use. In addition, Korlu and Mede (2018) also found that most students believed Quizlet could make their word learning faster and easier, as the words learn, quickly, effortlessly, fast recurred at least 16 times in the participants' responses. Tanjung and Daulay (2022) employed a qualitative descriptive research approach to ascertain the perceptions of students regarding the usability of the Quizlet application. The findings revealed that students expressed a high level of comfort, enjoyment, and ease of comprehension when utilizing the Quizlet application. Additionally, Korlu and Mede (2018) found that Quizlet's various learning and game features helped students learn target words, and that using the mobile tool to store, learn, and practice vocabulary was easy and practical for them. Participants stated that they felt more comfortable learning vocabulary with Quizlet and that the game's learning features made it easy to use and quick for them to remember the new words they had learned.

According to the results of previous studies above, Quizlet is an easy and accessible vocabulary learning tool with a straightforward interface for most learners. However, since most learners in China cannot download the Quizlet application, most learners can only use the web version of Quizlet to learn vocabulary. Further empirical research is necessary to determine whether Chinese college English learners view Quizlet as a straightforward and easily used vocabulary learning tool.

2.5.3.4 Attitudes towards the use of Quizlet

The attitudes towards utilization are contingent upon the extent to which a specific technological tool is favored by EFL learners in their learning (Arshad et al., 2012). Most of the studies (Aprilani, 2021; Chaikovska & Zbaravska, 2020; Cho, 2021; Cinar & Ari, 2019; Lee & Koo, 2018; Li et al., 2020; Pham, 2022; Rejeki et al., 2020) focused on the use of Quizlet shown that learners had positive attitudes towards vocabulary learning with Quizlet in general. Learners like to learn vocabulary with Quizlet can be seen from several aspects.

Setiawan and Wiedarti (2020) observed a strong inclination among students to engage in vocabulary learning using Quizlet. The students demonstrated a proactive response by promptly accessing the Quizlet application on their smartphones, even without explicit instructions from the teacher. Additionally, the students expressed a genuine enjoyment and keen interest in utilizing Quizlet as a tool for vocabulary acquisition. Additionally, it was reported that students derive pleasure from the process of acquiring vocabulary knowledge through the utilization of Quizlet. This phenomenon can be attributed to the increased level of student engagement observed in language learning, as

noted by Golonka et al. (2014). Consequently, the learner can allocate greater attention to the acquisition of vocabulary by utilizing the Quizlet Application.

Convenience is another reason why students seem to favour Quizlet. According to Korlu and Mede (2018), many students in the experimental group (using Quizlet to learn vocabulary) stated that they used Quizlet to study vocabulary while traveling by bus and metro. The students replied that one of the reasons they like Quizlet for vocabulary study is that they can type on their mobile devices more easily while taking public transportation. In a similar vein, Dreyer (2014) also found that students responded favourably to Quizlet, with the majority of them choosing it over other vocabulary review tools and citing the Scatter activity as their favourite Quizlet module, followed by the Learn activity. Additionally, Quizlet was preferred by students over other applications (podcasting), according to Bueno-Alastuey and Nemeth (2022), because Quizlet learning had been more effective and successful. According to Anjaniputra and Salsabila (2018), students who used the Quizlet application appeared enthusiastic about learning vocabulary, and it even helped them become less bored with it. Additionally, students said that Quizlet offered a fresh and entertaining approach to pick up vocabulary (Lander, 2016).

Furthermore, vocabulary learning with Quizlet improves learner performance, and their autonomy is enhanced as most students prefer to work independently, and students become more autonomous after using this tool (Korlu & Mede, 2018). The appropriateness of the Quizlet Application for autonomous learners has been attributed to its design (Sanosi, 2018). Additionally, Dizon (2016) demonstrated similar findings, indicating that Quizlet serves as a valuable and effective resource for enhancing vocabulary acquisition and fostering learner autonomy in the context of vocabulary learning. Other studies also

showed that using the Quizlet application could foster student autonomy and motivation (Ali & Kassel, 2018). Because Quizlet can provide learners with a new learning opportunity in a foreign context, simulate reality, generate interest in technology, and make learners more autonomous in their learning style (Lander, 2015). Quizlet was popular with students as it was proved to be an extrinsically motivating factor in vocabulary learning (Jackson, 2015). Students' boredom is overcome, a new non-threatening atmosphere is created, and students' confidence in learning English is improved (Hikmah, 2019).

However, Lam et al. (2018) investigated students' perceptions of Quizlet as a Chinese learning tool; their study was conducted among 7th and 8th graders enrolled in a Chinese program at a middle school. The results show that Quizlet is not a popular language learning tool, as students are not willing to use Quizlet every day or at home, generally. The reason may be that the Chinese language is not like other alphabet-centred ones; using a logographic system for its writing is the central characteristic of the Chinese language. Furthermore, Chinese is a tonal language where different pitches of a phoneme sound indicate different word meaning (Swan and Smith, 2001). Therefore, learners must listen to and reproduce unfamiliar tones and sounds by writing skills that are involved in generating Chinese characters (Moser, 2010).

Some disadvantages may make learners dislike using Quizlet as a vocabulary learning tool. For instance, learners could be distracted by smartphone instant messages sent by their friends when they are studying vocabulary on the Quizlet application, and it is difficult to assign a suitable visual for learners because it is difficult for them to find an appropriate picture for some abstract words (Korlu & Mede, 2018; Pham, 2022). Furthermore, one study set on Quizlet will take learners a long time to complete, which

makes learning with Quizlet tedious, as the vocabulary exercises in each activity are repeated (Al-Malki, 2020). As different studies showed different learners' attitudes to using Quizlet, it is necessary to investigate further what attitudes of Chinese college EFL learners towards using Quizlet as their college English vocabulary learning tool.

2.5.3.5 Behavioural intention towards the use of Quizlet

Behavioural intention is operationalized as students continued intent to engage in foreign language-related activities utilizing one or more Web 2.0 tools (Arshad et al., 2012). In this study, behavioural intention refers to learners' intention to perform vocabulary learning activities using Quizlet. Some of the previous studies showed that students are willing to utilize Quizlet in the future to acquire vocabulary. For example, Dreyer (2014) found that students introduced to Quizlet in high school are likelier to use it in college. According to the survey, most students will be using Quizlet in the future. More importantly, those students who used Quizlet the most are the likeliest to use Quizlet again.

In a quasi-experimental study, Van et al. (2020) examined first-year undergraduate students who did not major in English and their attitudes toward using Quizlet. The data was gathered through a questionnaire. *Perceived usefulness* and *perceived ease of use* are the two main factors that influence a user's behavioural intention to use a technology, and these factors were taken into consideration when designing the questionnaire based on the Technology Acceptance Model. The findings demonstrated that students felt positively about using Quizlet to learn vocabulary in English and thought the app was beneficial for their English language learning. Additionally, they thought that Quizlet was an easy-to-use resource for EFL students. The findings also demonstrated the students' readiness to use Quizlet to learn vocabulary in the future.

However, a few studies also demonstrated that learners did not like to use Quizlet very much, as they thought that it was easier to remember words by writing them down on a piece of paper; they liked the way used before or preferred to remain with techniques they were used to (Lander, 2015). Furthermore, Cho (2021) verified that Quizlet has a positive effect on improving students' vocabulary. However, the correct answer system is sensitive and tricky, so students showed dissatisfaction with using Quizlet. Furthermore, Lam et al. (2018) found that Quizlet is not a popular vocabulary learning tool for Chinese foreign language learners; they are reluctant to use it daily or at home. Additionally, Çeçen (2020) investigated how tertiary-level EFL students perceived Quizlet; the findings showed that, in comparison to higher-level students, lower-level students had more positive opinions about using the tool alone or in combination. However, Lee and Koo (2018) discovered that when it came to the enjoyment and learning impact, the high-proficiency group had a more positive perception than the low-proficiency group.

Different scholars' studies on the perceptions of Quizlet show different findings and Chinese college English learners are also a different group from the participants in the above studies. Furthermore, there is little research on how they view Quizlet as an application for learning English in college. Therefore, it is necessary to investigate further and demonstrate the perceptions and attitudes of Chinese college English learners towards using Quizlet for vocabulary learning.

2.6 Theoretical Framework

This study is based on the Nation's (2013) framework of vocabulary knowledge and Arshad et al. (2012) revised Technology Acceptance Model to examine the effects of using Quizlet among college EFL learners and their perceptions towards using it.

2.6.1 Nation's (2013) Framework of Vocabulary Knowledge

In the present study, Nation's (2013) framework of vocabulary knowledge and the most effective strategies he suggested would be used to address the findings of receptive and productive vocabulary knowledge performance. The most effective strategies proposed by Nation (2013) including retrieval, flash card, repetition, and picture. Nation (2001, 2013) provided the most comprehensive description of vocabulary knowledge and Nation (2019) described it as word knowledge model. While Godfroid (2019) named the word knowledge model as a framework of vocabulary knowledge. In this study, the term "framework of vocabulary knowledge" would be used to refer to the Nation's (2001, 2013) word knowledge model.

Through the framework of vocabulary knowledge, Nation (2001, 2013) demonstrated that knowing a word generally involves form, meaning, and use; the three aspects of vocabulary knowledge could be broken down into nine different aspects of knowledge and each of these could be broken down further into receptive and productive knowledge, part of the frame of vocabulary knowledge as shown in Table 2.2.

Table 2.2: Nation's (2013) Framework of Vocabulary Knowledge

Aspects of vocabulary knowledge		*Receptive/ productive*	*What does it means to master this aspect?*
Meaning	Form and meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	Concept and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	Association	R	What other words does this make us think of?
		P	What other words could we use instead of this one?

Note: In column 3, R = receptive knowledge, P = productive knowledge.
Source: Adopted from Godfroid, 2019

However, Nation (2019) claimed that the importance of the different facets of word knowledge is not equal. In the early stages of learning, it is anticipated that the form-meaning connection would constitute the primary aspect of word acquisition for many words (Nation, 2019; Nakata, 2019). Because the word form-meaning connection mastering is a prerequisite for further lexical learning (Schmitt, 2010). In the present study, it is necessary to study the form-meaning connection first, as the participants are college EFL learners whose English proficiency relatively low. Furthermore, the study aimed to examine the effects of Quizlet in college EFL learner vocabulary knowledge performance, while Chien (2015) claimed that Quizlet mainly focuses on the two elements of "form-meaning connections" and "written forms". Therefore, the present study only focused on the aspects of the form-meaning connection. The receptive knowledge of form-meaning refers to the meaning of word form signal, and the productive knowledge of form-meaning refers to the word form be used to express this meaning.

Nation (2013) suggested that the most effective kinds of learning for the aspect of meaning knowledge is strong explicit learning. Ellis (1995) also argued that learning word meaning and linking the word form to the meaning is especially suited to explicit conscious learning. The activities including depth of processing through the use of images, elaboration, deliberate inferencing, as shown in Table 2.3.

Table 2.3: Kinds of vocabulary knowledge and the most effective kinds of learning

Kinds of knowledge	*Kinds of learning*	Activities
Meaning	Strong explicit learning	Depth of processing through the use of images, elaboration, deliberate inferencing

Nation (2013) posits that there are three psychological conditions that foster effective vocabulary learning: noticing, retrieval, and creative use. The initial cognitive process that facilitates vocabulary acquisition is the act of noticing, which involves directing one's attention towards a particular word. Retrieval is a significant cognitive process that has the potential to facilitate the remembrance of a word. As stated by Nation (2013), the act of retrieval can be categorized into two distinct types: receptive and productive. According to Nation (2013), if the form and meaning of a concept are presented simultaneously to the learner, retrieval does not take place. Creative processing refers to the cognitive phenomenon wherein words that have been encountered before are subsequently encountered or utilized in manners that deviate from their previous encounters.

The degree of connection between the form and its meaning plays a crucial role in determining the learner's ability to efficiently recall the meaning upon encountering the word form, as well as to effectively produce the word form when intending to express the corresponding words (Nation, 2013). Therefore, it is crucial that learners are provided with ample opportunities for spaced repetition, ensuring that they not only comprehend the form and meaning of the information initially, but also engage in regular retrieval practice (Baddeley, 1990; Nation, 2013). According to Nation (2019), the utilization of receptive and productive retrieval, as well as varied retrieval and elaboration, has the potential to enhance the form-meaning connection. Receptive retrieval, as described by Nakata (2019) and Nation (2019), refers to the cognitive process wherein a learner is presented with a word through visual or auditory means and subsequently engages in the task of recalling its corresponding meaning. Incidental acquisition of vocabulary can take place during reading activities, while deliberate vocabulary learning can be facilitated using flashcards (Nation,

2019). The process of productive retrieval refers to the cognitive process wherein a learner actively seeks to articulate a specific meaning and must retrieve the corresponding spoken or written word form from memory (Nakata, 2019; Nation, 2019).

According to Nation (2008) and Nation (2019), flash card learning, along with other techniques such as guessing from context, word part learning, and the use of dictionaries, is a highly effective strategy for vocabulary acquisition. The use of retrieval is widely considered to be a fundamental principle in facilitating effective flash card learning (Nation, 2019). The term "flash card" refers to the link established between a foreign language word, whether written or spoken, and its corresponding meaning, which is typically presented as a translation in the learner's first language (Nakata, 2011). The learner goes through a series of cards, observing the foreign term and attempting to remember its corresponding definition. If the learner is unable to access the information, he or she will invert the card and refer to the translation (Nation, 2013). Images, videos, and audios are examples of multimedia elements that can be included in computer-based flash cards. Quizlet (https://quizlet.com/), a popular web-based flashcard program, is known to provide automated suggestions for the definitions and visual representations associated with lexical items inputted by its users (Nakata, 2020). The use of images is advantageous because they can visually depict the intended message conveyed by words, especially when referring to real-world things or actions. This visual aid has the potential to improve the learning process (Nation, 2019).

Repetition plays a crucial role in the process of vocabulary acquisition. This is due to the extensive amount of information associated with each word, which cannot be fully grasped in a single encounter. Additionally, it is not enough to simply be aware of

vocabulary items; they must be thoroughly understood and readily accessible for fluent usage (Nation, 2001, 2013). According to the Nation's (2019) findings, it is crucial for each word to encounter multiple instances across diverse contexts. Rather than anticipating complete mastery of a word upon initial exposure, it is more realistic to anticipate gradual and progressive development and consolidation of knowledge regarding to each word over time. As stated by the Nation (2019), the primary focus of a teacher should not be on the way a word is initially presented to students, but rather on ensuring that the word is encountered repeatedly in diverse contexts. Quizlet as one of the digital flash card application/websites provides learners with diverse learning module to ensure the repetition in vocabulary learning process that would be benefit for college EFL learners' receptive and productive vocabulary knowledge learning.

2.6.2 Technology Acceptance Model

With the rapid development of new information technology, education has become a digital process, especially in language learning, where digital tools have gained much attention. Digital vocabulary learning tools like mobile apps, online platforms, and game-based learning tools provide language learners with interactive and personalized learning experiences (Alimkhanova et al., 2023; Mykytka, 2023). To understand and predict learners' acceptance and behavioral intention toward these tools, many researchers have adopted the Technology Acceptance Model (TAM) to guide their studies (Abdullah et al., 2016; Al-Emran et al., 2018; Arshad et al., 2012; Prayog & Prayog, 2021; Van, 2022; Yüksel et al., 2022; Zeitlin & Sadhak, 2023).

The Technology Acceptance Model (TAM) was proposed by Davis in 1989 and examined the mediating role of perceived ease of use and perceived usefulness in

predicting the use of information technology and explaining why users accept or reject information technology. It includes six research variables: perceived usefulness, perceived ease of use, attitude towards, behavioural intention to use, actual system use, and external variables as in Figure 2.1. TAM posits perceived usefulness and ease of use as primary relevance for user acceptance of technologies. Davis et al., (1989) used TAM to explain computer use behaviour, addressing the problem of how to predict computer acceptance from measures of intention, and how to explain intention from measures of attitude, perceived usefulness, perceived ease of use, and related variables. Their empirical investigation revealed that the perceived usefulness of computers is a primary factor influencing people's intents to use them, while the perceived ease of use is a significant secondary factor. To clarify, while ease of use is undoubtedly significant, the system's usefulness holds even greater importance and should not be disregarded.

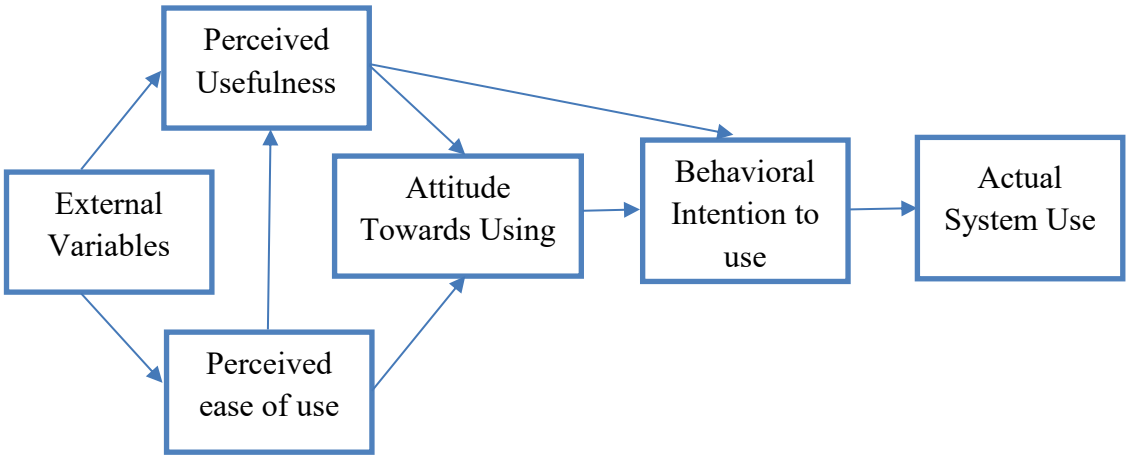


Figure 2.1: Technology Acceptance Model

Source: adopted form Davis et al., 1989, p.985

In the field of language education, based on the original version of TAM, modified versions of TAM also arose, such as Arshad et al. (2012) and Çeçen (2020) research

models. In Davis' (1989) TAM, the central core constructs of perceived usefulness and ease of use are supplemented by four additional core constructs in Arshad et al.'s (2012) model. These include awareness, attitudes toward use, behavioural intention, and actual system usage, as depicted in Figure 2.2. Arshad et al., (2012) used TAM model as theoretical framework to investigate students' awareness, behavioral intentions and factors that influence the learning of English using Web 2.0 technologies, such as Facebook, Yoube, Twitter, Wiki, LiveMocha and Flickr. The framework model was chosen as a theoretical framework for their study because it states that people tend to form attitudes and intentions when using a particular new technology and that several factors influence the decision of how and when to use this technology. In addition, students' intention to use some new technology to learn English can be best explored using this model (Arshad et al., 2012), as shown in Figure 2.2.

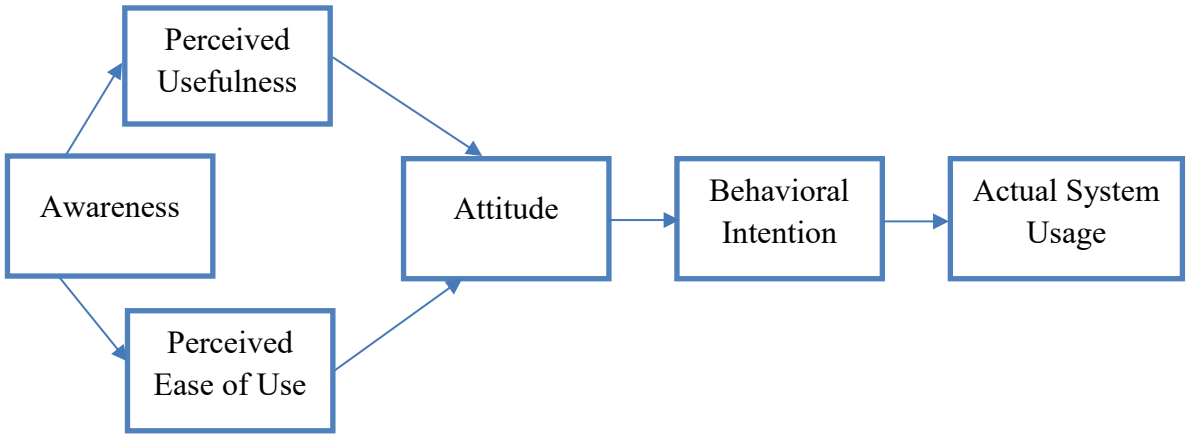


Figure 2.2: Modified Technology Acceptance Model

Source: adopted form Arshad et al., 2012

The six variables are explained as follows according to Arshad et al. (2012) study.

Awareness:

Awareness refers to the state or capacity to observe, experience, or have conscious knowledge of events or objects (Davis, 1989). It encompasses the state or characteristic of being aware or mindful of something. Arshad et al. (2012) assessed the degree to which students perceive that using Web 2.0 technology will enhance their English language learning.

Perceived usefulness:

Perceived usefulness refers to the extent to which an individual believes that utilizing a specific system would improve their job performance (Davis, 1989). The perceived usefulness has a significant impact on the user's acceptance of using a computer and is favorably correlated with computer usage (Davis et al., 1989). Arshad et al. (2012) assessed the degree to which students see the use of Web 2.0 to be helpful for the acquisition of English.

Perceived ease of use:

It stands for the extent to which learners believe that using a specific technology tool would be effortless.

Attitudes towards use:

It is related to the degree to which a particular technology tool is favored by learners for their EFL learning.

Behavioural intention:

It is operationalised as the continued students' intention to perform foreign language learning-related activities using one or another Web 2.0 tool.

Actual system use:

It is described in relation to the recurrence of the usage of specific technology tools by learners in EFL context awareness.

In the area of vocabulary learning, several studies have utilized the TAM model as a theoretical framework to investigate students' perceptions of using digital game-based vocabulary learning methods to improve their vocabulary knowledge performance (Prayogi & Wulandari, 2021; Van, 2022; Yüksel et al., 2022; Zeitlin & Sadhak, 2023). For example, Prayogi and Wulandari (2021) conducted classroom action research to analyze how Quizlet, a digital vocabulary learning platform, was implemented in helping students learn vocabulary and how students perceived the application. Data on learners' perceptions of using Quizlet was collected using a questionnaire developed based on Davis' (1989) TAM model, which includes two parts: perceived ease of use and perceived usefulness. The study's results showed a high level of agreement with Quizlet's ease of use and usefulness, and they concluded that the students had a positive attitude toward implementing the application. The results from the analysis of the interview data also confirmed the students' favorable attitude towards using Quizlet.

Similarly, in the study, Zeitlin and Sadhak (2023) assessed tertiary students' perceptions of using the Quizlet flashcard system in their courses. The data collected by the questionnaire was also developed based on the Davis (1989) TAM model. It was found that learners perceived the ease of use and usefulness of Quizlet and then showed high approval of using it. The other study conducted by Van (2022) explored the perceptions of non-English major university students at Vietnamese universities regarding the usefulness and ease of use of the Quizlet in English learning based on the Davis (1989) TAM model.

The results showed that most students think that English learning applications are beneficial to their learning and easy to use. Due to the positive perceptions of students towards using Quizlet, Van (2022) highly suggested that Quizlet be implemented in the context of English teaching and learning at Vietnam's higher education institutions. In addition, a study conducted by Yüksel et al. (2022) to investigate learners' perception of using digital flashcards (Quizlet) found that students' perceptions about using Quizlet to study technical vocabulary were positive, their perceptions of the usefulness of the Quizlet application were a predictor of their success in digital flashcard condition, and practicing through digital application positively predicted their intention to use Quizlet.

In another study, Çeçen (2020) employed a research model inspired by Arshad et al. (2012) to examine the perceptions of EFL learners regarding the utilization of three online vocabulary learning applications. Çeçen (2020) asserts that the TAM model has garnered interest among foreign language researchers as one of the sources for establishing the theoretical framework in studies on the perceptions and attitudes of technology users. Furthermore, Lee et al. (2003) claim that the TAM remains the prevailing and extensively utilized theoretical framework for elucidating individual user acceptance within information systems since Davis's inception in 1989. One of the objectives of the current study was to examine the attitudes and perceptions of college EFL learners regarding the utilization of Quizlet. This vocabulary learning tool incorporates digital flashcards and game-based elements. Hence, the TAM can be employed as a framework to guide the study in developing a questionnaire and semi-structured interview protocol to investigate the Chinese college EFL learners' perceptions of using Quizlet as their college English vocabulary learning tool.

Based on the Arshad et al.'s, (2012) Modified Technology Acceptance Model, the present study employed a framework of five dimensions: perceived usefulness, perceived ease of use, attitude towards use, behavioural intention, and actual system use. The rationale for omitting the concept of awareness in the present investigation stems from the fact that none of the participants possessed prior knowledge of utilizing Quizlet as a tool for enhancing their college-level English vocabulary acquisition before administering the Quizlet treatment.

2.7 Conceptual framework

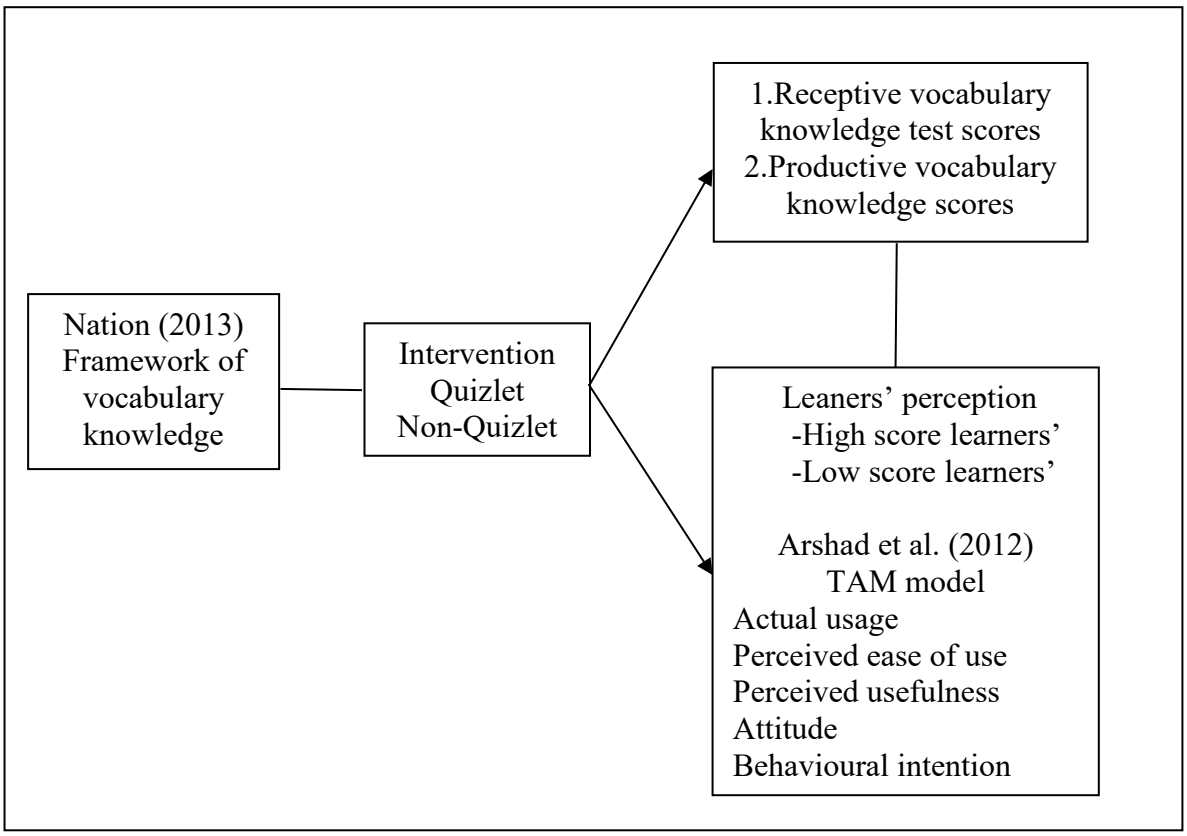


Figure 2.3: Conceptual framework

A conceptual framework serves as a tool for illustrating the interconnections betwe en various concepts and their impact on the phenomenon being studied (Ngulube et al., 201 5). According to the definition provided by Miles and Huberman (1994), a conceptual framework is a means of elucidating the primary elements to be examined, such as key factors, constructs, or variables, along with their presumed interrelationships, either through graphical representation or narrative exposition. Frameworks can vary in their level of complexity, ranging from rudimentary to elaborate. They can be rooted in theoretical foundations or based on common sense principles. Additionally, frameworks can be descriptive in nature or more informal in their approach. In the current research, the hypothesized relationships between the key factors, constructs, and variables are represented by a causal network flowchart in Figure 2.3.

2.7.1 Dependent and Independent Variables

The dependent variable in this study encompasses the test scores for receptive vocabulary knowledge and productive vocabulary knowledge, the mean scores of the questionnaire items, and the themes derived from the interview transcripts. The independent variable would be the Quizlet intervention.

2.7.2 Control Variables

The control variables affect the dependent and independent variables, particularly in a causal relationship study (Lee, 2021). Control variables should be overlooked or deliberately ignored to minimize the risk of compromising internal validity.

a) Attendance

The subjects' attendance in the current study should be considered, as previous studies have demonstrated a causal effect of absence on performance in studies. The absence of subjects could affect the vocabulary test results. Therefore, the subjects' attendance during the intervention period would be noted.

b) History

The control variable of history includes relevant events that may unintentionally occur between the pretest and posttest and produce effects that could be considered treatment effects (Lee, 2021, p.154). In the current study, all participants are in the same college, they are exposed to the same material as provided by the college, and they have experienced the same teaching method and the same number of hours of instruction.

b) Experimental attrition

Compared to studies with a relatively short time, the chances of attrition are higher (Cohen et al., 2018). Attrition did not occur in the current study, as all subjects in the pilot and main study stayed in.

c) Maturation

Maturation is an essential factor in an experimental educational study (Campbell et al., 1966) as it relates to the age of cognitive development. The intervention period of the current study was short, and therefore the maturation process of the participants in the current study can be considered less severe.

2.8 Summary

This chapter began by reviewing the instruction of vocabulary and describing the features and functions of Quizlet. The research focused on digital game-based vocabulary learning was reviewed, and the effects of vocabulary learning based on Quizlet and the research on learners' views of Quizlet were also reviewed. The theories and conceptual framework used in this study were presented at the end of the chapter.

CHAPTER 3

METHODOLOGY

3.1 Chapter Overview

This chapter presents the research methodology used in this study, starting with the research design, the participants, the instrument, the validity and reliability of the instruments, the data collection procedures, the data analysis procedures, and ending with the ethical issues of the study.

3.2 Research Design

Research design is a procedural-cum- operational plan that details what and how different methods and procedures are to be applied during the research process to find answers to research questions as validly, objectively, accurately, and economically as possible (Creswell & Garrett, 2008; Kumar, 2019). In the present research design, a mixed method, both quantitative and qualitative, was used in this study, as shown in Figure 3.1. Mixed method is a type of research design in which both qualitative and quantitative methods are used in the formulation of research questions, ways of gathering and analyzing data, and/or conclusions drawn from the findings (Creswell & Plano Clark, 2018; Creswell & Tashakkori, 2007; Kumar, 2019; Tashakkori & Teddlie, 2003; Teddlie & Tashakkori, 2009).

With the primary research purposes were i) measuring the effects of differentiated learning approach (Quizlet-based vocabulary learning and paper-based word list vocabulary learning) through comparison between pre-and post-test scores and ii) gathering feedback from the research participants to investigate their perceptions of using

Quizlet as their English vocabulary learning tool. The mixed methods approach was considered more appropriate for the present study, as mixed method enables a more comprehensive and complete understanding of phenomena to be obtained than single quantitative or qualitative methods approaches and answers complex research questions more meaningfully (Cohen et al., 2018; Creswell, 2003; Creswell & Plano Clark, 2011; Mohd Said, 2019).

Moreover, mixed method research included examining and testing hypotheses as well as exploring and understanding the underlying reasons behind the effects (Teddlie & Tashakkori, 2009). Mixed method research can provide a more complete picture of the phenomenon under study than would be yielded by a single approach, thereby overcoming the weaknesses and biases of single approaches (Creswell & Plano Clark, 2011, 2018; Denscombe, 2014; Day & Sammons, 2008). Especially in the present study, mixed methods involved using in-depth semi-structured interviews in conjunction with web-based questionnaires. One type of data gives greater depth, whereas the other gives greater breadth; together, it is hoped that they yield results from which one can make better inferences (Dörnyei, 2007; Teddlie & Tashakkori, 2009). In addition, using the mixed method can increase data accuracy and reliability through triangulation, reducing bias in the research (Denscombe, 2014). The advantages of the mixed method mentioned above have motivated the choice of a mixed methods approach in this research.

The study consisted of three strands: a quantitative pretest and posttest strand to address question one and two, and a quantitative questionnaire strand followed by a qualitative individual semi-structured interview strand to address question three and four. The numeric data, pretest, and posttest scores were collected first to provide the results of

the effect of Quizlet on the performance of vocabulary knowledge learning. At the same time, the goal of questionnaire strand and semi-structured strand were to address the question quantitatively and qualitatively to gain deeper insight into college EFL learners' perceptions of using Quizlet in vocabulary learning.

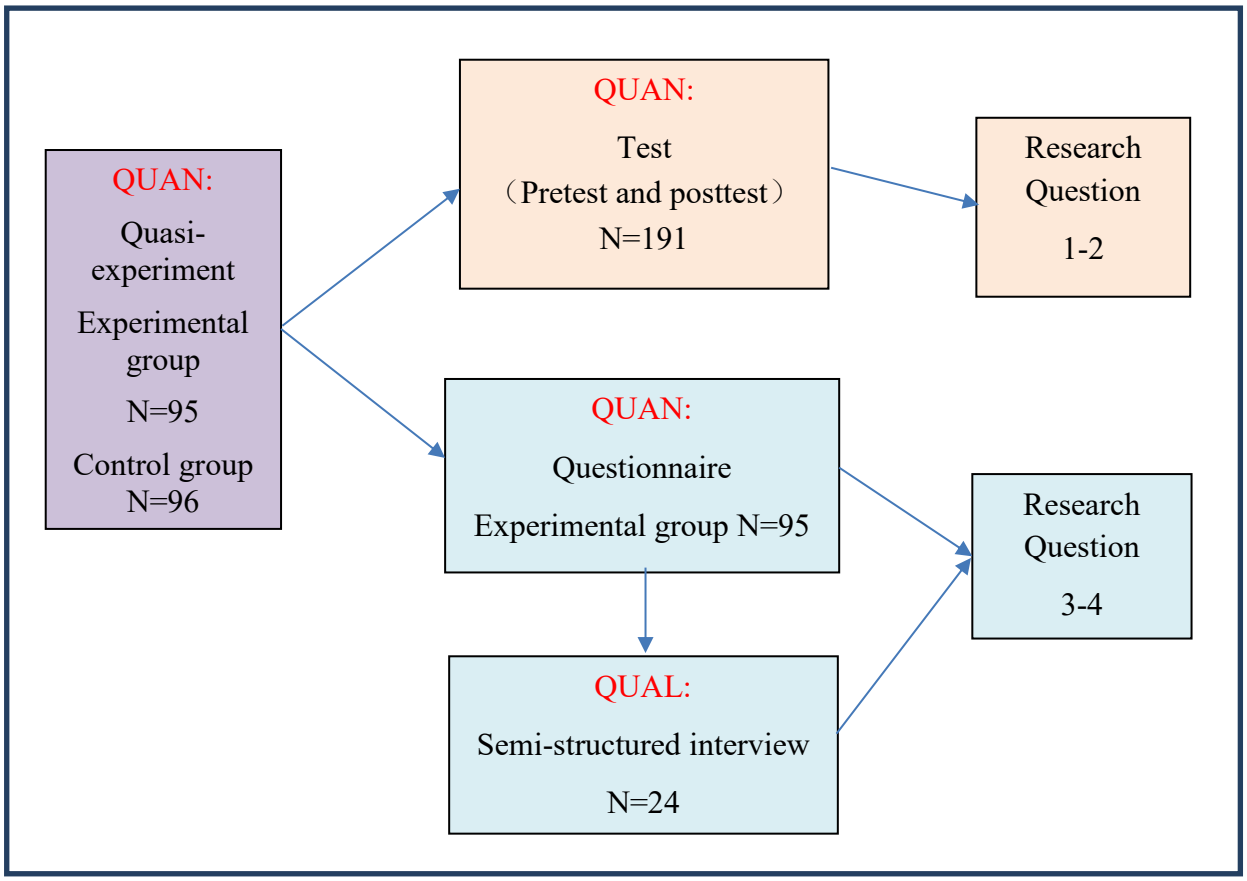


Figure 3.1: Mixed method research design

Note: QUAN = Quantitative research method

QUAL = Qualitative research method

For the question three, firstly, the quantitative questionnaire provided a general picture of college EFL learners' views on using Quizlet. And Qualitative follow-up semi-structured interviews with a subset of purposefully selected questionnaire respondents sought deep insight into the perceptions of college EFL learners. In the final stage of the study for question three, the quantitative and qualitative findings from the two strands were

integrated to provide complete and insightful answers to research question three. Four the question four, the data collected by questionnaire was used to show the difference of the perceptions of high-level proficiency learners and low-level learners.

3.2.1 Quasi-experiment

The current study employed a quasi-experimental approach to examine the effects of Quizlet-based vocabulary learning on Chinese college students studying English as a foreign language. Quasi-experimental research encompasses research designs that share similarities with experimental research in terms of the presence of treatments, outcome measures, and experimental units (Kumar, 2019; Teddlie & Tashakkori, 2009). Experimental research is a research approach where the investigator intentionally manipulates one or more independent variables (treatments) to determine their effect on one or more dependent variables (Teddlie & Tashakkori, 2009). Human participants in the experimental study are assigned to treatments randomly. Due to practical limitations, quasi-experimental research typically does not employ random assignment to treatment conditions (Cohen et al., 2018). Due to practical and ethical limitations, it is not feasible to randomly assign students in an educational setting to a new research program (Teddlie & Tashakkori, 2009). Considering that one of the study's goals was to investigate the effects of Quizlet-based vocabulary learning in a college setting, it is suitable to choose a quasi-experimental design for the current study.

There are several quasi-experiment forms, such as the one-group pretest-posttest design, one-group posttest only design, non-equivalent posttest only design, pretest-posttest non-equivalent group design and one-group time series design (Cohen et al., 2018). One commonly used quasi-experimental design in educational research entails the

inclusion of an experimental group and a control group (Campbell & Stanley, 1963; Cohen et al., 2018). Both groups are administered a pretest and a posttest; however, it is important to note that the control group and the experimental group lack pre-experimental sampling equivalence. In contrast, the groups consist of naturally formed collectives, such as classrooms, which are as similar as possible given the constraints of availability.

Table 3.1: Non-equivalent quasi-experimental control group pretest/posttest design

Group	Pretest	Intervention	Posttest
Experimental group	Vocabulary pretest	Quizlet-based learning	Vocabulary posttest
Control group	Vocabulary pretest		Vocabulary posttest

The present study took students from intact classes as participants, as the classes were assigned after students enroll in college according to their majors, and the college did not allow the researcher to reassign the classes. Therefore, the non-equivalent quasi-experimental control group pretest and posttest design were chosen as the suitable research design for intact class experiments. According to Cohen et al. (2018), in the field of educational research, it is frequently impractical for researchers to conduct true experiments that involve random selection and random assignment of participants to control or experimental groups. In such cases, quasi-experimental designs may be more appropriate. Additionally, the non-equivalent control group design bears resemblance to the classical experimental design, with the exception that participants are not assigned to groups through randomization.

The non-equivalent quasi-experimental control group pretest and posttest design in the present study were used to explore the cause-and-effect relationship between variables. Since the experimental approach can examine and experimenting with hypotheses pertaining to cause-and-effect relationships; the most plausible method in solving both practical and theoretical educational predicaments (Ary et al., 2009; Cohen et al., 2018). The study's independent variable was the Quizlet intervention, and the dependent variables were scores on vocabulary knowledge tests, including receptive vocabulary knowledge test scores and productive vocabulary knowledge test scores. The quasi-experimental design is shown in Table 3.1. The quasi-experiment evaluated an intervention's effectiveness using Quizlet; it ran for eight weeks, and Quizlet was used both in and out of class for the entire duration.

3.2.2 Web-based Questionnaire

A web-based questionnaire was used to obtain quantitative data on participants' perceptions of using Quizlet. There are several reasons for choosing the web-based questionnaire method in the present study. Firstly, web-based questionnaires are a suitable method for collecting quantitative data on individuals' opinions and emotions pertaining to a particular situation or topic in academic research (Muijs, 2022). Secondly, the Web-based questionnaire method holds significant importance as a data collection method within the realm of social sciences (Frankfort-Nachmias et al., 2014; Teddlie & Tashakkori, 2009). Thirdly, a Web-based questionnaire could help collect information and data on attitudes and preferences, beliefs and predictions, opinions, behaviours, and past and present experiences (Aldridge & Levine, 2001). Finally, Web-based questionnaires have several advantages over paper-based surveys. For example, they can reduce costs and

increase efficiency over traditional questionnaire methods. According to Cohen et al. (2018), the utilization of web-based questionnaires enables expedited data collection and processing, thereby minimizing the temporal demands associated with data distribution, completion, collection, and processing. This is achieved through the automatic processing of data as respondents enter it, obviating the need for subsequent manual entry by the researcher.

Further, Chinese college students find it convenient to connect to the internet using their mobile phones, as the majority of them possess their own cell phone. Thus, employing web-based questionnaires for data collection in the current study is a highly efficient and economical approach. Moreover, Web-based questionnaire can be easily filled out by respondents at their own convenience, resulting in increased response rates and more comprehensive data. Moreover, the process of automating data gathering, and analysis not only saves time and money, but also minimizes the likelihood of errors. Ultimately, the capability to watch and monitor replies in real-time grants researchers with useful insights and enables prompt revisions to the questionnaire if needed. Given the advantages described earlier of using a web-based questionnaire, the current study chose to use this method to gather quantitative data on learners' perceptions.

3.2.3 Semi-structured Interview

A semi-structured interview was employed to address research question three, which focused on the perceptions of college English EFL learners regarding the utilization of Quizlet in their vocabulary learning process within their college English courses. This approach aimed to cross-validate the data gathered from the questionnaire and get more in-depth information on college EFL learners' perceptions on using Quizlet. According to

Adams (2015), the utilization of semi-structured interviews in mixed methods research can serve as a valuable supplementary tool to enhance and enrich other research methodologies. Furthermore, Drever (2003) emphasized the importance of utilizing both interviews and questionnaires simultaneously, as interviews offer a comprehensive understanding within a specific context, while questionnaires provide a broader, albeit sometimes superficial, perspective.

The interview is a form of dialogue involving multiple participants, typically interviewers and interviewees, wherein inquiries are posed with the aim of eliciting information from the interviewees (Ruslin et al., 2022). Normally, interviews serve as a means of gathering data pertaining to an individual's experiences, knowledge, ideas, beliefs, feelings, and demographic information (Best et al., 2017). There are various types of interviews, namely structured, unstructured, and semi-structured interviews. Structured interviews are characterized by predetermined topics, processes, question sequences, and terminology, hence allowing minimal flexibility for interviewer adaptations (Cohen et al., 2018). An unstructured interview is a qualitative research approach in which the interviewer conducts an open-ended dialogue with the subject, without adhering to a predetermined list of questions or a formal interview protocol. Generally, unstructured interviews focused on a particular issue can yield a significant volume of pertinent material, mainly when administered by someone with expertise in the field (Bell, 2010). The semi-structured interview method combines the advantages of unstructured and structured interviews. Semi-structured interviews, akin to structured interviews, involve the utilization of predetermined topics and questions. Nevertheless, the inquiries presented in the interview are not restrictive and can be customized for each participant based on their responses, utilizing prompts and additional questions as necessary (Cohen et al., 2018).

In this study, Semi-structured interviews were chosen to collect qualitative data. This method allows researchers to obtain detailed insights from participants while maintaining some control over the discussion (Adams, 2007). The semi-structured style enables researchers to investigate participants' responses, address unexpected answers, and explain ambiguous statements, resulting in a more thorough comprehension of the research issue (Roulston & Choi, 2018). In addition, this approach has demonstrated its efficacy in capturing participants' distinct experiences and viewpoints, which cannot be achieved using quantitative methods (Adeoye-Olatunde & Olenik, 2021; Brinkmann, 2014; Patton, 2014). Hence, the current research aims to gain an in-depth comprehension of college EFL learners' perspectives regarding the use of Quizlet by conducting semi-structured interviews. These findings will then be cross validated with the analysis from the questionnaire, thereby improving the reliability and validity of the research.

3.3 Research Sampling

Sampling is an integral component of scholarly inquiry, wherein the selection of a suitable sampling strategy significantly influences the research's overall quality. Consequently, researchers are required to make informed sampling decisions at the beginning of the research planning process (Cohen et al., 2018).

3.3.1 Sampling Technique

The study employed purposive sampling techniques to select a sample for the collection of both quantitative and qualitative data. Purposive sampling, according to Neuman (2013), refers to a non-random sampling technique employed by researchers to identify and include all potential instances of a particularly specific and challenging-to-access population.

3.3.1.1 Quasi-experiment (Pretest and Posttest) Sampling Technique

This study used purposive sampling to select the participants as quasi-experimental participants. Purposive sampling (also known as purposive or judgment sampling) is based on the premise that finding the best cases for the study will produce the best data, and research findings directly result from the sampled cases (Patton, 2014). The study employed purposive sampling, specifically homogenous sampling, to select samples based on their similarity (Teddlie & Yu, 2007). The participants were selected within this scope: college students, EFL learners, attending college English course, in colleges located in Shandong province. The scope of purposive sampling selection was in line with the purpose of the quasi-experimental study, which was to examine the effectiveness of vocabulary knowledge performance of Chinese college EFL learners who used Quizlet to aid vocabulary learning in their college English courses.

3.3.1.2 Sampling Technique for Questionnaire Data Collection

The current study employed purposive sampling to select respondents for the questionnaire. The questionnaire served as a means of collecting quantitative data to investigate study question three, which pertains to the perspectives of college EFL learners regarding using Quizlet as a tool for assisted vocabulary learning in their college English course. Within the framework of a quasi-experimental research design, the control group participants were exposed to the traditional approach of vocabulary acquisition. In contrast, the experimental group utilized Quizlet as a supplementary tool for vocabulary learning. The primary objective of the questionnaire is to examine the perspectives of individuals who engage in vocabulary acquisition via Quizlet. Consequently, individuals assigned to the experimental group who have undergone an eight-week Quizlet intervention will be

chosen as respondents for the questionnaire. According to Teddlie and Yu (2007), purposive sampling is a method commonly employed to select a limited number of examples that can yield the most comprehensive insights into a specific phenomenon. This approach allows a more in-depth understanding of a carefully chosen subset of cases. The study participants undergoing the Quizlet intervention were required to provide more comprehensive insights into their perceptions of utilizing Quizlet.

3.3.1.3 Semi-structured interview sampling technique

Stratified purposive sampling (quota sampling) was used to select subjects as respondents to obtain in-depth information about college EFL learners' perceptions of using Quizlet. According to Teddlie and Yu (2009), that stratified purposive sampling is a widely recognized fundamental mixed method sampling strategy. This sampling procedure exhibits the characteristic of probability sampling in terms of its stratification nature, while also demonstrating the characteristic of purposive sampling due to the typically limited number of cases it generates. In this methodology, the investigator partitions the target population into distinct subgroups, known as strata, and subsequently employs purposive sampling methods to select a limited number of cases from each stratum for an in-depth investigation. The technique enables the investigator to identify and elucidate with precision the attributes that exhibit similarities or differences among various strata or subgroups. In the current study, the participants assigned to the experimental group were categorized into four subgroups according to their English scores on the college entrance examination. Each group selected six students as participants for semi-structured interviews, all of whom were volunteered to be interviewed.

3.3.2 Participants

3.3.2.1 Quasi-experiment Pretest and posttest participants

The participants were selected by purposive sampling technique, which addresses specific purposes related to research questions (Teddlie & Tashakkori, 2009). The purpose of using a pretest and posttest is to measure the performance of Chinese college EFL learners' vocabulary knowledge with the intervention of Quizlet in Shandong Province. Therefore, 191 first year college EFL learners form four intact classes who major in preschool education in a private college in Shandong province are selected as participants.

Table 3.2: Demographic information of pretest and posttest participants

Group		N	Percentage
Experimental group	1. gender		
	a. Female	88	93%
	b. Male	7	7%
	2. age		
	18	12	13%
	19	63	66%
	20	18	19%
	21	2	2%
		N	Percentage
Control group	1. gender		
	a. Female	95	99%
	b. Male	1	1%
	2. age		
	18	14	15%
	19	61	63%
	20	19	20%
	21	2	2%

The participants were divided into control (N=96) and experimental group (N=95) who took pretest before intervention and posttest after intervention. The figure is deemed acceptable considering that Cohen et al. (2018) argued that if researchers plan to employ statistical analysis, a sample size of 30 cases is minimum required, and a minimum number of 15 participants is required for a quasi-experimental research design (Dörnyei, 2007; Cohen et al., 2018; Kumar, 2019). The demographic information for pretest and posttest participants shows in the Table 3.2.

Table 3.2 above shows 93% female and 7% male participants in the experimental group. It is similar to the percentage of participants in the control group, which includes 99% female and 1% male participants. It also indicates that the dominant age of the participants in the two groups was between 19 and 20 years old.

3.3.2.2 Participants for questionnaire data collection

Cohen et al. (2018) argued that a minimum sample size of thirty is widely regarded as necessary for researchers intending to employ statistical analysis in their data. However, it is important to note that this number is considered minimal. The current study involved the collection of questionnaire data from a sample of 95 participants. The objective of this study was to investigate the perceptions of college EFL learners regarding the utilization of Quizlet as a tool for vocabulary acquisition. The analysis focused on several dimensions: actual usage, perceived ease of use, perceived usefulness, attitude towards use, and behavioural intention. Based on the mean scores of receptive and productive vocabulary knowledge performances, the participants were categorized into two groups: high-level proficiency learners and low-level proficiency learners. The aim was to examine the similarities and differences in perceptions regarding using Quizlet as a means for learning

vocabulary for college-level English among learners at different proficiency levels. The individuals who attained average posttest scores beyond 27 points were classified as learners with high-level proficiency. This group consisted of a total of 47 participants. The 48 individuals who had posttest average mean scores of 27 points or below were classified as learners with low-level proficiency.

3.3.2.3 Semi-structured interview participants

The participants chosen for the qualitative follow-up semi-structured interviews were drawn from the pool of participants who had previously completed the questionnaire as part of the experimental group. According to Creswell and Plano Clark (2011), ensuring consistency in participant selection is crucial for maintaining methodological integrity in research design, particularly when incorporating both quantitative and qualitative components. This consistency should extend to the inclusion of the same participants in subsequent qualitative semi-structured interviews. This is because the primary objective of these interviews is to provide an explanatory framework for the original quantitative findings. In addition, including fresh participants may give rise to disparate perspectives, thus introducing incongruities in the conclusions derived from examining both quantitative and qualitative data (Teddlie & Shakori, 2009).

To try to ensure that the interviews are rich in data and to avoid the concentration of interviewees who are all learners with high levels or all learners with low levels, the interviewers were selected from the members of the experimental group of four different levels. The four levels were divided based on their National College Entrance Examination English subject scores. The National College Entrance Examination holds significant importance and exerts a substantial influence in mainland China. Following the

implementation of the Quizlet intervention, a group of 24 subjects in the experimental group was chosen for the semi-structured interview. This group consisted of six participants at each level and their participation are voluntary. The study encompassed a total of 16 subjects classified as high-level, 31 subjects classified as medium-level, and 23 subjects classified as low-level. Additionally, the study involved 25 participants who gained admission to college through the spring college entrance examination. The profiles of the participants who participated in the semi-structured interviews are presented in Table 3.3.

Table 3.3: Profiles of interviewees

Interviewee	Age	Gender	level	Year of learning English
Student 1	19	Female	High	10
Student 2	19	Female	High	10
Student 3	20	Female	High	10
Student 4	18	Female	High	10
Student 5	19	Female	High	10
Student 6	19	Female	High	10
Student 7	19	Female	medium	10
Student 8	19	Female	medium	11
Student 9	19	Female	medium	10
Student 10	19	Female	medium	10
Student 11	19	Female	medium	10
Student 12	20	Female	medium	10
Student 13	18	Male	Low	10
Student 14	19	Female	Low	12
Student 15	18	Female	Low	10
Student 16	19	Female	Low	10
Student 17	19	Male	Low	10
Student 18	19	Female	Low	10

Table 3.3 Continued

Student 19	19	Female	Spring	7
Student 20	20	Female	Spring	7
Student 21	19	Female	Spring	10
Student 22	19	Female	Spring	10
Student 23	18	Female	Spring	7
Student 24	20	Male	Spring	6

3.4 Research Instrument

The instruments for the present study include a pretest, a posttest, a web-based questionnaire, and an interview protocol.

3.4.1 Pretest and Posttest

The vocabulary knowledge test was divided into two parts, a receptive vocabulary knowledge test, and a productive vocabulary knowledge test. The content of pretest and posttest were the same; only the order of the questions was different. The receptive test used a receptive recall test in which the target words cued responses of native language meaning. Niu and Helms-Park (2014) also used the test form to assess participants' receptive vocabulary knowledge learning that required participants to provide Chinese meanings for 20 English words. In addition, Webb (2009) also used the receptive recall test to measure the receptive knowledge of meaning and form. For example, in his study the learners were required to write the Japanese meaning of locomotive beside the target word. The purpose of the receptive recall test was to examine the mastery of participants' receptive vocabulary knowledge; the recall test required the students to write the meaning of corresponding English. In (1), the learners were required to write the Chinese meaning of the target word, such as *Mega, strive, and slang.* As can be seen in Appendix A, the

whole receptive vocabulary knowledge test paper included 60 target words, 1 point for each word; full marks were 60 points.

(1)

*Mega*_____

*strive*_____

*slang*_____

For the productive vocabulary test, a letter-cued word completion task (Niu & Helms-Park, 2014) was adapted to assess participants' productive vocabulary knowledge learning. Laufer and Nation (1999) argued that this type of test is a convenient instrument that is easy to administer and can be completed quickly. The test is easy to mark, as there is only one correct word for each item, and each answer is correct or incorrect (Laufer & Nation, 1999). In another study, Zheng (2009) used the same form of productive knowledge test to examine Chinese EFL learners' productive vocabulary knowledge. She posited that the inclusion of the initial letters of the target items was intended to discourage participants from substituting a semantically appropriate word from a different frequency level within the given context. In addition, Kiliç (2019) also used the cued recall test as productive knowledge test to measure Turkish EFL Learners' productive vocabulary knowledge performance. In the study, to prevent participants from writing words not included in the content of this semester, they were required to complete a set of blank-embedded sentences with the cued initial and last letters, as illustrated (2) below:

(2)

My a_____e(零用钱) was sufficient to afford my mom's birthday gift.

我的零用钱足够给妈妈买一份生日礼物。

And it has turned c_____l(传统的) thinking about foreign aid on its hand.

它也转变了对国外援助的传统看法。

We all d_____e（渴望） health and happiness.

我们都渴望健康和幸福。

We are the keepers of this l_____y(遗产).

我们是这个遗产的保存者。

F_____n(系牢，扣紧) seat belt while seated.

就坐后请系好安全带

In the study, the productive recall test not only provided participants with cued recall; for example, the first and last letters of the target words were presented, but also the Chinese meaning was shown simultaneously. According to Nation (2013, 2022), employing the meaning of one's first language offers a valuable approach for assessing vocabulary, encompassing receptive and productive skills, as well as recall and recognition tasks. Therefore, the present study adopted a form with a letter-cued word completion task. The productive vocabulary knowledge test paper (see Appendix B) was administered in the present study, which included 60 target words and 1 point for each word; the total marks are 60 points.

The target vocabulary was from Unit 3 to Unit 6 of the *New Practical English Comprehensive course 1* which was the college English textbook used in the second semester of Weifang Institute of Technology College. Each unit of this *New Practical English Comprehensive Course 1* textbook is equipped with a list of new words that the students are required to master while studying that unit. In this study, when selecting the

test target words, three teachers with more than five years of experience in teaching college English courses agreed together to select 15 words for each unit based on the word class, length of the words, and the difficulty of the words. A total of 60 target test words were selected from the four units and the sample target words are shown in Table 3.4.

Table 3.4: Sample of the target words

Exit (v)	Ignore (v)	Notify (v)	Fasten (v)	Spacious (adj)
Worn (adj)	Fantastic (adj)	Military (adj)	Splendid (adj)	Dynasty (n)
Sedan (n)	Beacon (n)	Emperor (n)	Legacy (n)	Investigate (v)

3.4.2 Questionnaire

The questionnaire consists of two parts; the first part includes five questions to collect demographic data of the participants, as shown in Figure 3.2, and the other part includes five constructs, a total of 32 question items designed based on Davis's (1989) technology acceptance model and Arshad et al.'s (2012) revised model, in which perceived usefulness and ease of use were two primary factors of the TAM model. All items for the second part are close-ended questions with a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) and were written in Chinese to avoid misunderstandings, as all participants' English proficiency was low. As noted by Mackey and Gass (2021), to overcome the potential limitation of low proficiency in the foreign language hindering comprehension of the questionnaire items, it is recommended that the questionnaire be administered in the learners' native language. Additionally, it is advisable to allocate sufficient time for the learners to seek clarification and provide accurate responses. The web-based questionnaire for the actual study in Chinese is shown in Appendix L.

Name:
Gender:
Student No.
Age:
Years for learning English:

Figure 3.2: Demographic information of questionnaire respondents

The first construct of the questionnaire was actual system usage question items including five items as shown in Table 3.5, which adapted from Çeçen (2020) and Seleviciene and Burkšaitiene (2015) that used to collect the data about users' perceptions on the actual system use of Quizlet to learn English.

Table 3.5: Actual system usage question items

Source	Original item	adopted/adapted item
Çeçen, 2020	I always use Quizlet to learn English.	1. After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.
	I believe that using Quizlet can improve my language competency.	
	I always use Web 2.0 technologies to learn English.	2. I believe that using Quizlet can improve my English vocabulary knowledge.
Seleviciene & Burkšaitiene, 2015	I believe that using Web 2.0 technologies can enhance my language competency.	3. I believe that using Quizlet can improve my English language competency.
		4. I believe that using Quizlet can increase my English receptive vocabulary knowledge.

Table 3.5 Continued

	5. I believe that using Quizlet can increase my English productive vocabulary knowledge.

The second construct of the questionnaire was questions on perceived usefulness of Quizlet including seven items as shown in Table 3.6, which adapted from Çeçen (2020) and Van, et al. (2020) that used to collect the data about users' perceptions on the usefulness of Quizlet to learn English.

Table 3.6: Perceived usefulness of Quizlet question items

Source	**Original item**	**adopted/adapted item**
Van, et al., 2020	Quizlet helped me learn English vocabulary more quickly.	1. Quizlet helped me learn English vocabulary more quickly. 2. My Receptive vocabulary knowledge was improved by using Quizlet. 3. My Productive vocabulary knowledge was improved by using Quizlet. 4. The use of Quizlet helped me to improve my reading skills. 5. The use of Quizlet helped me to improve my writing skills. 6. The use of Quizlet helped me to improve my speaking skills. 7. The use of Quizlet helped me to improve my listening skills.
	My English vocabulary was improved by using Quizlet.	
Çeçen,2020	The use of Quizlet helped me to improve my reading skills.	
	The use of Quizlet helped me to improve my writing skills.	
	The use of Quizlet helped me to improve my speaking skills.	
	The use of Quizlet helped me to improve my listening skills.	

The third construct of the questionnaire was questions on perceived ease of using Quizlet including five items as shown in Table 3.7, which adapted from Çeçen (2020) and Dizon (2016) that used to collect the data about users' perceptions on the ease of using Quizlet to learn English.

Table 3.7: Perceived ease of using Quizlet question items

Source	**Original item**	**adopted/adapted item**
Dizon, 2016	The Quizlet website and/or mobile app was clear and understandable.	1. The Quizlet website and/or mobile app was clear and understandable. 2. For me, it is easy to learn English vocabulary through Quizlet. 3. For me, it is easy to learn English receptive vocabulary knowledge through Quizlet. 4. For me, it is easy to learn English productive vocabulary knowledge through Quizlet. 5. For me, it is easy to use Quizlet.
Çeçen, 2020	For me, it is easy to learn English through Quizlet.	
	For me, it is easy to use Quizlet.	

The fourth construct of the questionnaire was questions on attitude towards using Quizlet, including seven items as shown in Table 3.8, which adapted from Çeçen (2020), Masrom (2007), Seleviciene et al. (2015) that used to collect the data about users' attitude on using Quizlet to learn English.

Table 3.8: Attitude towards using Quizlet question items

Source	**Original item**	**adopted/adapted item**

Table 3.8 Continued

Masrom, 2007	I have a generally favorable attitude towards using E-learning.	1. I have a generally favorable attitude towards using Quizlet learning English vocabulary.
Huang, 2007	I would like to use M-learning.	2. I would like to use Quizlet learning English receptive vocabulary knowledge.
Çeçen, 2020	When compared to traditional classroom learning, the use of Quizlet made my learning more entertaining.	3. I would like to use Quizlet learning English productive vocabulary knowledge. 4. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining. 5. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse. 6. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective. 7. The advantage of using Quizlet overweighs the disadvantages of using it.
	When compared to traditional classroom learning, the use of Quizlet made my learning more diverse.	
	When compared to traditional classroom learning, the use of Quizlet made my learning more effective.	
Seleviciene & Burkšaitiene, 2015	The advantage of using Web 2.0 technologies overweighs the disadvantages of not using it.	

The last construct of the questionnaire was questions on learners' behavioural intention using Quizlet, including seven items as shown in Table 3.9, which adapted from Cho (2021), Masrom (2007), Park (2012), Seleviciene et al. (2015), and Van, et al. (2020) that used to collect the data about users' behavioural intention on using Quizlet to learn English.

Table 3.9: Behavioral intention question items

Source	**Original item**	**adopted/adapted item**
Van, et al., 2020 Masrom, 2007	I want to learn English vocabulary with Quizlet in the future. I will return to E-learning often.	1. I want to learn English vocabulary with Quizlet in the future. 2. I want to learn English receptive vocabulary knowledge with Quizlet in the future. 3. I want to learn English productive vocabulary knowledge with Quizlet in the future. 4. I will use Quizlet often. 5. I am going to positively utilize Quizlet to learn English vocabulary. 6. I will add Quizlet as another medium to learn English. 7. Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.
Park, 2012	I am going to positively utilize mobile learning.	
Seleviciene & Burkšaitiene, 2015	I will add Web 2.0 applications as another medium to learn English.	
Cho,2021	Quizlet helped me study English vocabulary, so I think it would be good to use it even after entering high school in the future.	

Through the guidance of the teachers, all the students who participated in the experiment knew the existence of Quizlet, so there is no need to include the awareness module in this experiment. The pilot questionnaire items, as can be seen in Appendix C, were adapted or adopted from Masrom (2007), Park (2012), Seleviciene et al. (2015), Çeçen (2020), Van et al. (2020) and Cho (2021). The non-web-based questionnaire for actual study in English can be seen in Appendix M. The questionnaire items were

translated into Chinese by a professional translator, and the questionnaire aimed to determine students' perceptions of using Quizlet to learn new vocabulary.

3.4.3 Interview Protocol

A semi-structured protocol was designed based on Davis's (1989) technology acceptance model and Arshad et al.'s (2012) revised model. The main purpose of conducting the interviews was to understand and get in-depth information on the respondents' perceptions of using Quizlet for vocabulary learning.

Table 3.10: Semi-structure interview main questions

Source	**Original item**	**adopted/adapted item**
Lander, 2016	Do you think Quizlet is a useful learning tool? If so, why?	Do you think Quizlet is useful learning tool? If so, why?
Chien, 2015	How did you feel about learning vocabulary through online flashcards and exercises?	How did you feel about learning vocabulary through Quizlet?
Tolleson, 2018	Which functions or games in Quizlet do you use the most?	Which functions or games in Quizlet do you use the most?
Tolleson, 2018	Do feel that using Quizlet is easy or difficult to use?	Do feel that using Quizlet is easy or difficult to use?
Chien, 2015	Why are these online vocabulary websites easy to use? Why are they not easy to use ?	Why is Quizlet easy to use? Why is not easy to use?

The interview protocol's questions, as seen in Table 3.10, include the perceived usefulness of Quizlet, attitude toward using Quizlet, and perceived ease of using Quizlet.

Guided by the TAM mode, the interview protocol includes five parts: actual system use, perceived usefulness, attitude towards use, perceived ease of use, and behavioural intention. The detailed protocol contents (see Appendix D) included most of the questions but not all the questions, as during the interview, the interviewer would ask other questions according to the interviewees' answers to get more depth information. In order to make all the questions fully understood by the respondents and to ensure they could express their opinions in detail, all the questions asked during the interview were in Chinese.

3.5 Instruments' Validity and Reliability

The effectiveness of any data collection procedure is contingent upon the presence of reliability and validity (Best et al., 2017). The complete elimination of threats to validity and reliability is an unattainable goal; however, the negative effects of these threats can be reduced by consistently addressing validity and reliability concerns throughout the research process (Cohen et al., 2018). Validity and reliability possess distinct connotations within the realms of quantitative, qualitative, and mixed-methods research. It is essential that these are clearly stated, and that the researcher demonstrates fidelity to the approach they are working with and adheres to the required principles of validity and reliability (Cohen et al., 2018).

3.5.1 Instruments' Validity

The validity holds significant importance in the realm of research, playing a crucial role in ensuring the effectiveness of the study. According to Cohen et al. (2018), if a research study lacks validity, its worthiness is diminished. According to Gronlund (1981), it is important to recognize that research cannot achieve complete validity, and so, validity should be understood as a relative concept rather than an absolute one. Validity refers to

the inherent quality of a data collection instrument or procedure, enabling it to accurately measure the intended construct or phenomenon (Best et al., 2017). The subsequent sections provided a description of the validity of the three instruments employed in this study.

3.5.1.1 Pretest and posttest validity

This study is a non-equivalent quasi-experimental control group pretest/posttest research design with a mixed method for data collection. As Cohen et al. (2018) stated, research cannot be 100% valid; researchers should try their best to minimize invalidity and maximize validity. Campbell and Stanley (1996) have conducted a comprehensive analysis to identify and examine several factors that pose potential threats to the validity of experimental research. These threats encompass elements such as history, maturation, testing, selection, experimental mortality (attrition), and diffusion. In addition, Creswell and Plano Clark (2018) suggested that one of the strategies to minimize threats to mixed methods experimental design is to address internal and external threats noted about experimental designs.

To minimize the threats to quasi-experimental research in this study, various measures were taken as follows. Within the realm of quantitative research, the potential influences of history and maturation are acknowledged as factors that pose threats to the overall validity of the research (Cohen et al., 2018). Therefore, the threats of history and maturation must be considered first. To mitigate potential confounding variables, both the experimental and control groups were exposed to identical activities, with the exception of the treatment, thereby ensuring that participants share a common history. The two groups are of similar age and are likely to mature and develop similarly to ensure the same maturation and participants with the same language background, language learning

experience, and level of proficiency. During the experiment period, try best to keep the two groups as separate as possible, and the content of the treatment must be through the online class of the research to learn; the control group participants would not be allowed to join in the online class of the experiment to ensure the dangers of diffusion to this study.

The selection of achievement tests is significantly impacted by the issue of content validity, as highlighted by Gall et al. (2003). To establish content validity, it is essential for the instrument to exhibit the ability to encompass the domain or items adequately and inclusively it claims to encompass (Carmines & Zeller, 1979). The evidence presented in this study is derived from a thorough examination of course textbooks, syllabi, objectives, and evaluations made by subject matter experts (Best et al., 2017). In this study, the content of the pretest and posttest items were selected evenly from Unit 3 to Unit 6 of the textbook, covering the entire domain of the tests used in this study. The test ceiling should also be considered, as Gall et al. (2003) suggested, to avoid the low-test ceiling tests, the tests for receptive and productive knowledge did not use the form of multiple-choice question items.

Moreover, to avoid the high-test ceiling, all the question items provided Chinese translation, which would be easy for the participants to understand. Furthermore, the content validity in the tests of this study and the materials used in the study were also checked by three experienced teachers who have been teaching college English courses for more than five years. The three teachers engaged in a process of negotiation among themselves, wherein they made modifications to certain words to address the issue of imbalanced difficulty. A pilot study was conducted before the tests were distributed to the control and experimental groups to ensure face validity.

3.5.1.2 Questionnaire validity

Questionnaires are commonly employed in various types of research, including surveys and action research. The validity of questionnaires can be assessed from two perspectives. One of the primary concerns is the extent to which individuals who participate in surveys provide accurate, truthful, and precise responses. The second point of consideration pertains to the potential similarity in response distribution between individuals who did not submit their questionnaires and those who did (Cohen et al., 2018). To enhance the rate of questionnaire completion. The questionnaires were disseminated to the participants within their educational setting after implementing Quizlet as a tool for vocabulary acquisition. The researcher provided a comprehensive explanation of the terminologies involved, such as receptive vocabulary knowledge and productive vocabulary knowledge, and instructed the participants on how to complete the questionnaires correctly. Additionally, the researcher addressed any uncertainties or queries the participants raised.

The questionnaire's face validity is also crucial; before it was given to the experimental group members, a pilot study with a different class of college EFL students who had similar learning experiences was carried out. The contents, wording, and length of the pilot questionnaires were analysed. Refinement would be applied based on what the target sample would need. An expert panel made up of three college English instructors with more than five years of experience in the field determined the content validity of the adopted and modified survey instrument. An interview that was semi-structured was done to cross-validate the research questionnaire and increase its validity. According to Gall et al. (2003), the triangulation method can be used to verify the validity of a questionnaire or interview when it is used in a qualitative study.

Validity testing was used to determine the degree of validity of the measurement tools (questionnaires) used in the study. That is, a valid research instrument is a truly appropriate instrument for measuring what it is supposed to measure. According to Fatonah et al. (2020), the question items to variables with critical values (r_{item} value) bigger than the *rtable* value show that the question items are valid in explaining the variables based on the calculation of the correlation table.

Table 3.11: Validity test for Actual System Usage

Question	r_{item}	r_{table}	Results
Actual_1	.723	.202	Valid
Actual_2	.829	.202	Valid
Actual_3	.810	.202	Valid
Actual_4	.849	.202	Valid
Actual_5	.834	.202	Valid

Table 3.12: Validity test for Perceived Usefulness

Question	r_{item}	r_{table}	Results
Useful_1	.743	.202	Valid
Useful_2	.702	.202	Valid
Useful_3	.781	.202	Valid
Useful_4	.809	.202	Valid
Useful_5	.868	.202	Valid
Useful_6	.817	.202	Valid
Useful_7	.821	.202	Valid

Table 3.13: Validity test for Attitude towards use

Question	*ritem*	*rtable*	Results

Table 3.13 Continued

Attitude_1	.779	.202	Valid
Attitude_2	.873	.202	Valid
Attitude_3	.888	.202	Valid
Attitude_4	.837	.202	Valid
Attitude_5	.895	.202	Valid
Attitude_6	.894	.202	Valid
Attitude_7	.800	.202	Valid

Table 3.14: Validity test for Perceived Ease of Use

Question	*ritem*	*rtable*	Results
Ease_1	.791	.202	Valid
Ease_2	.851	.202	Valid
Ease_3	.887	.202	Valid
Ease_4	.895	.202	Valid
Ease_5	.709	.202	Valid

Table 3.15: Validity test for Behavioral intention

Question	*ritem*	*rtable*	Results
Intention_1	.893	.202	Valid
Intention_2	.882	.202	Valid
Intention_3	.874	.202	Valid
Intention_4	.831	.202	Valid
Intention_5	.881	.202	Valid
Intention_6	.825	.202	Valid
Intention_7	.852	.202	Valid

Table 3.11 to Table 3.15 shows that all the question items of five dimensions are valid. This is supported based on the correlation table of the question items to variables that have values bigger than the critical value as stated in the column of the *rtable* indicating that all the question items are valid.

3.5.1.3 Interview protocol validity

To increase the external validity of the qualitative part of the study, a clear, detailed, and in-depth description was provided. As Schofield (1996) comments, clear, detailed, and in-depth description is essential in qualitative research; it is through clear, detailed, and in-depth description that others can decide the extent to which findings from one research can be generalized to another. Moreover, Eisenhart and Howe (1992) suggest that it is possible to assess the typicality of a situation, such as the participants and settings, to identify possible groups and to indicate how data might be transferred to different settings and cultures. Furthermore, Lincoln and Guba (1985) suggest that research should provide sufficiently rich data for readers and users of the research to determine whether transferability is possible.

In the study, a survey and an interview were used to cross-validate the data on EFL learners' perceptions of using Quizlet. Cohen et al. (2018) stated that mixed methods can address convergent validity. A comparative approach can be employed to assess the congruence between datasets obtained through distinct methodologies that address similar research questions. If the findings derived from both the qualitative and quantitative data exhibit consistency, it can be inferred that the presence of convergent validity has been established (Cohen et al., 2018). Moreover, Best, et al. (2017) also mentioned that internal validity is concerned with the accuracy of the information and how it matches reality.

Triangulation can increase the internal validity of qualitative research, verifying data by agreeing with other data obtained from other sources, different researchers/data collectors, or different data collection procedures.

Member checking was used to ensure the validity of the research; after the interview recording was transcribed, each interviewee received the transcription of the recording. The interview transcription was presented to the interviewee to allow them to correct or add further information to the recording. According to Lincoln and Guba (1985), peer debriefing—exposing oneself to unbiased peers in a way similar to cross-examination—and member checking can be used to address validity in naturalistic inquiry.

In addition, Ary et al. (2010) mention that face validity is vital in survey research. The content interview protocol was compiled based on the revised TAM module of Arshad et al. (2012) and adopted interview questions from previously studied; the central question for the construct of actual system use was adapted from Lander (2016), and the main question for the construct of ease of use was adapted from Tolleson (2018), the main question for the construct of attitude towards use was adapted from Chien (2015).

In addition, experienced peers in the field examined the protocol's content to assess if it was suitable for measuring the objectives of the searcher. According to Best et al. (2017), validity is enhanced when the interview is built upon a thoughtfully crafted framework, guaranteeing that content validity—the ability to elicit important information—and that the critical assessment of experts in the field aids in the selection of pivotal questions.

3.5.2 Instruments' Reliability

Reliability is the extent to which a test or procedure produces similar results under constant conditions on every occasion (Bell, 2010; Best et al., 2017). In other words, reliability indicates how consistently a test measures what it measures (Ary et al., 2010). There are different ways of ensuring the reliability of research, depending on the data collection method.

3.5.2.1 Pretest and posttest reliability

In this study, three experienced teachers teaching college English courses were trained to score the pre-and posttests to ensure the reliability of the tests. The three raters follow the same criterion to score the tests. According to Cohen et al. (2018), when multiple researchers participate in a study, inter-rater reliability can be used to achieve reliability as equivalency because human judgment is prone to error. To ensure agreement among all researchers, data entry must be done consistently by each researcher.

The pretest and posttest were administered in the classroom where the atmosphere and testing situation was the same as normal class time. Before the tests began, the teacher told them that the results would not affect their final examination marks and not to make the students nervous. According to Cohen et al. (2018), a variety of factors can impact an exam's reliability, including the time of day, the season, the test room's temperature, the test's perceived importance, the formality of the setting, test anxiety, the extent to which students guess their answers, the administration and marking procedures, and the test items' degree of closure or openness. Thus, the examination environment during the test was considered to guarantee the test's reliability.

This study used the split halves to calculate the reliability of the internal consistency of the tests. After participants completed the tests, the tests were artificially split in half, and the individual scores on the two halves were correlated. According to Bell (2010) and Cohen et al. (2018), the split-half method also states that correlation coefficients can be used to calculate the reliability of pretests and posttests. As Ary et al. (2010) stated that after giving the test to the group, the researcher divided the items into two halves, assessed each subject's score on the two halves, and computed a correlation coefficient. A test is considered highly reliable if every subject had a very similar position on the two halves; if there is little consistency in the positions, the test is considered lowly reliable.

Table 3.16: Productive vocabulary knowledge posttest split-half reliability

Cronbach's Alpha		Spearman-Brown Coefficient
Part 1 (30 items)	Part 2 (30 items)	
.891	.899	.873

The Productive Vocabulary Knowledge test has 60 question items in total, when doing the split-half test, the items were divided equally into 2 parts, both have 30 question items in each part. The Cronbach's alpha of part 1 is .891, that of part 2 is .899, and the Spearman-Brown coefficient is .873 (see Table 3.16). Therefore, the productive vocabulary knowledge test has a relatively high level of reliability.

The Receptive Vocabulary Knowledge Test has a total of 60 items, when doing the split-half test, the items were divided equally into 2 parts, both have 30 items in each part. The Cronbach's alpha of part 1 is .874, part 2 is .895, and the Spearman-Brown coefficient

is .723 (see Table 3.17), so the reliability of the receptive vocabulary knowledge test is relatively high.

Table 3.17: Receptive vocabulary knowledge posttest split-half reliability

Cronbach's Alpha		Spearman-Brown Coefficient
Part 1 (30 items)	Part 2 (30 items)	
.874	.895	.723

3.5.2.2 Questionnaire reliability

A Questionnaire was conducted to investigate College EFL learners' perception of the Quizlet as an English vocabulary learning tool in the study. Cronbach's alpha values were used to estimate the internal consistency reliability of questionnaire scales and items. Cronbach alpha, frequently referred to as the alpha coefficient of reliability or simply the alpha, is one of the internal consistency measures (Cohen et al., 2018). As can be seen in the Table 3.18, the 32 items' Cronbach's Alpha = .973 ($\alpha > 0.7$), according to Nunnally (1978), alpha values equal to or greater than 0.70 are considered to be a sufficient condition. Thus, it can be concluded that these measures possess sufficient reliability.

Table 3.18: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.973	.974	32

Table 3.19 shows that Cronbach's alpha of each construct was above 0.7, and according to Nunnally (1978), alpha values equal to or greater than 0.70 are considered sufficient. Thus, the questionnaire was sufficiently reliable as an instrument for the study.

Table 3.19: Reliability Statistics of Every Construct

Construct	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Actual System Usage	.852	.868	5
Usefulness of Quizlet	.901	.902	7
Perceived Ease of Use	.901	.902	6
Attitude towards Use	.933	.934	7
Behavioural Intention	.943	.943	7

3.5.2.3 Interview protocol reliability

Silverman (2015) suggested that careful piloting of interview schedules can increase the reliability of interviews. The researcher made an appointment to interview the respondents at their convenience. And the interview was conducted through an online communication tool called "Tencent Video Conference", and only opened the phonetic function. Thus, the interviewees' faces were not seen, and only their sounds were recorded by the recording software. Best et al. (2017) stated that mechanical recording data collection can also be utilized to improve the reliability of qualitative research. In addition, Ary et al. (2002) suggested that non-face-to-face interviews can enhance their reliability, as the interviewee may disclose information that may not be as readily available in a face-to-face, more intimate situation.

This study employed both quantitative and qualitative methodologies to examine the perceptions of college EFL learners regarding the utilization of Quizlet as a method for

learning English vocabulary. According to Cohen et al. (2018), the triangulation method and member checking can enhance the reliability of qualitative research. In this study, the transcriptions of the interview recordings were presented to respondents, and they were allowed to correct and add information to ensure the reliability of the interview. The researchers carefully maintained all documentary evidence, which comprehensively documented various facets and phases of the study. This practice was undertaken to facilitate verification, while also adhering to the principles outlined by Golafshani (2003) regarding the importance of audit trails. These trails served to ensure the confirmability of research outcomes, both in terms of the research process itself and the resulting findings.

3.5.3 Pilot Study

The pilot study started from the first week of the Spring semester in 2022; before embarking on the research, a class with 91 students who also majored in preschool education was selected for the pilot study based on convenience and availability. The primary objective of the pilot study was to enhance the questionnaire's precision, ascertain its reliability, refine the tests, and further refine the interview protocol. Furthermore, the Cronbach alpha coefficient is employed to assess the internal consistency and reliability of the questionnaire, given that the items within the instrument are not dichotomously scored as correct or incorrect (Santos, 1999). In addition, the questionnaire's validity was assessed through consultation with experts both within and outside of the college. The recommendations put forth by the individuals were duly acknowledged, and appropriate modifications were implemented in response.

3.5.3.1 Pilot study for pretest and posttest

In the week-2 of the Spring semester in 2022, a total of 90 students in another class took the pretest. The pretest was conducted through the online learning tool “Xue Xi Tong”. The assessment for productive vocabulary knowledge was administered during the initial session. The productive vocabulary knowledge test was successfully completed by the students within a time frame of 30 minutes. Following the completion of the examination, the students proceeded to engage in further study of the subsequent unit’s subject matter. Subsequently, a brief intermission of 10 minutes was observed, following which the participants proceeded to undertake the assessment of their receptive vocabulary knowledge. When the students submitted the test paper, the online learning platform “Xue Xi Tong” automatically evaluated the students’ test papers and presented the results. After “Xue Xi Tong” presented the scores, the three raters checked the scores to investigate whether there was any error in the automatic scoring. Moreover, the raters check the face validity of the tests and judge whether the difficulty of each item is similar. Then a split-half test is conducted on the scores of the two test papers.

Split halves are a commonly employed technique for assessing the internal consistency of a test. It is critical that the test items exhibit a high degree of interrelatedness.

Table 3.20: Receptive vocabulary knowledge posttest split-half reliability

Cronbach’s Alpha		Spearman-Brown Coefficient
Part 1 (30 items)	Part 2 (30 items)	
.831	.879	.862

The receptive vocabulary knowledge test has 60 question items in total, when doing

the split-half test, the items were divided equally into 2 parts, both have 30 question items in each part. The Cronbach's alpha of part 1 is .831, that of part 2 is .879, and the Spearman-Brown coefficient is .862 (see Table 3.20). Thus, the reliability of the test of receptive vocabulary knowledge is relatively high.

Table 3.21: Productive vocabulary knowledge posttest split-half reliability

Cronbach's Alpha		Spearman-Brown Coefficient
Part 1 (30 items)	Part 2 (30 items)	
.923	.912	.923

The Productive Vocabulary Knowledge test has 60 question items in total, when doing the split-half test, the items were divided equally into 2 parts, both have 30 question items in each part. The Cronbach's alpha of part 1 is 0.923, that of part 2 is 0.912, and the Spearman-Brown coefficient is 0.923 (see Table 3.21). Hence, the test's reliability pertaining to the assessment of productive vocabulary knowledge is comparatively high.

3.5.3.2 Piot study for questionnaire

In the week-11 of the Spring semester in 2022, a total of 90 students in the pilot group completed the questionnaire. The questionnaire was distributed online "Wen Juan Xing" during their class time. The participants were provided with a comprehensive explanation by the researcher to ensure that the questionnaire items were comprehensible. The problematic parts of the questionnaire were revised. The instrument is highly reliable; the Cronbach alpha value was .986, as shown in Table 3.22. Moreover, each construct Cronbach alpha was above .70, which shows that the questionnaire instrument used to assess students' perception towards using Quizlet in EFL vocabulary learning is suitable for this research.

Table 3.22: Reliability Test Results (Cronbach Alpha)

Construct	Cronbach Alpha	N of items
Actual System Usage	.844	9
Perceived Ease of Use	.951	6
Perceived Usefulness	.965	17
Attitude Towards the use of Quizlet	.973	25
Behavioural Intention	.943	7
Total	.986	64

A test of normality was conducted by examining the skewness and kurtosis scores. The skewness and kurtosis scores of the study variables can be seen in Appendix E. Skewness and kurtosis are numerical values that provide information about sample data distribution. The skewness and kurtosis of a normal distribution is 0. Hair et al. (2010) and Byrne (2010) argued that data are normal if the skewness is between +2 and the kurtosis is between +7. In other words, if the skewness for data distribution is within the range of -2 and +2 and the kurtosis is within the range of -7 and +7, the data distribution is considered normal (Byrne, 2010; Hair et al., 2010). In this study, all the skewness and kurtosis values of the items are within the specified range. Therefore, the data are normally distributed.

Outlier test, the regression analysis was performed to identify the outliers for deletion. Mahalanobis distance was used to identify the outliers. Firstly, the mean of each construct was calculated, and then the Mahalanobis distance value was calculated through analysis, regression, and liner procedures. After obtaining the Mahalanobis Distance value, the Mahalanobis Distance value was transformed into a P-value. The P-value was 1-cdf.

chisq (Mahalanobis Distance value, predictors). In the study, the dependent variable is behavioral intention means, and the independent variables are actual system use mean, perceived usefulness mean, attitude towards use mean, and perceived ease of use mean. Therefore, the number of predictors was 4. Then calculate the P-value; if the P-value is below 0.001, the corresponding line data can be deleted; the respondents' data should be outliers. After carrying out the above procedure, no respondent's data was an outlier.

There are 64 question items for the pilot questionnaire; after being examined by three experienced College English teachers, some of the items with similar meanings were deleted to ensure the face validity of the research, and the questionnaire items for the actual research questionnaire were less than 64 items.

3.5.3.3 Pilot study for semi-structured interview

After the participants in the pilot group completed the questionnaire, four students were selected by purposive sampling to conduct the interview. The pilot interview was conducted through an online communication tool called "Tencent Video Conference"; the participants were familiar with using "Tencent Video Conference" software. To reduce the nervous feeling, the students were only allowed to use the sound function to communicate; the video did not open, and recording software was used to record the interview sounds. After the interview recordings were transcribed, the transcriptions were presented to the interviewees to check for errors or if they wanted to add additional information. The interview protocol was to be refined, and the order of the protocol questions was changed according to the respondents' suggestions. For example, in the pilot study of semi-structured interviews, the question order was Actual Usage, Attitude towards Use, Perceived Ease of Use, Perceived Usefulness, and Behavioral Intention. According to the

participants' suggestions, Perceived Usefulness should be asked earlier than Attitude, which would make them more comfortable answering. Therefore, in the actual study, the order was changed as questions on Perceived Useful earlier than Attitude. Although the semi-structured interview protocol was outlined, the question order sometimes changed depending on the respondent's answers. The pilot interview also ensured the time of the interview period, and it was convenient for the researcher to make an appointment with the respondents when doing the actual research.

3.6 Data Collection Procedures

The study started in the second semester of 2021-2022 academic year and lasted a duration of 12 weeks. In the first four weeks, students were guided to familiarize themselves with Quizlet. A detailed description of the instructional activities of the first four weeks can be found in Appendix F. During the fourth week of the study, the participants were administered pretests. Subsequently, in the thirteenth week, the participants completed a posttest and a questionnaire. From the group of participants, a portion of 24 students were selected as respondents for the semi-structured interview. This section provides a concise overview of the intervention and data collection procedures employed in the present study, as shown in Table 3.23.

Table 3.23: A summary of the study schedule

Time	Learning content	Stage
Week 1 (15th March 2022)	U1	Familiar with Quizlet
Week 2	U1	Familiar with Quizlet
Week 3	U2	
Week 4	U2	Pretests

Table 3.23 Continued

Week 5	U3	Quizlet intervention
Week 6	U3	
Week 7	U4	
Week 8	U4	
Week 9	U5	
Week 10	U5	
Week 11	U6	
Week 12	U6	
Week 13 (9th June 2022)	Posttest	Posttests, Questionnaire, semi-structured interview

3.6.1 Intervention

The experimental group received four weeks of instruction on how to use Quizlet prior to the start of the intervention. Following this, the experimental group engaged in an eight-week Quizlet intervention. Students in the control group engaged in vocabulary acquisition using a paper-based word list. The college English course is a comprehensive program that aims to enhance students' speaking, listening, writing, and reading proficiency. Hence, vocabulary acquisition is one of the essential parts of students' college English course learning. The students took the college English course that met twice a week, with each class session lasting two hours. The *College English Textbook 2* were used in the quasi-experimental study comprises seven units dedicated to four essential components: speaking, listening, writing, and reading, the excerpts of unit 3 of the textbook as shown in Appendix N. The students acquired one part of the unit during each class session, completing one unit after four class sessions. Therefore, it took two weeks

for the students to cover one unit of study. During each class, the teacher followed the lesson plan shown in Appendix G to proceed classes.

Lesson structure of the experimental group

1. Teacher shows how many target words would be learned in this lesson.
2. Teacher explains the meaning and usage of each target word with example sentences on slides.
3. Teacher asks students to read the target words three times following the Quizlet flashcard sounds.
4. Students are required to write the target words two times for each word.
5. Students are required to practice the target words on Quizlet and each of the modules must be used at least once and at the end of the practice students are required to complete the "Test" module.
6. Teacher explains textbook content with the target words.
7. Students do other activities, such as reading, speaking, writing, or listening.

Figure 3.3: Lesson structure of the experimental group

As depicted in Figure 3.3, the implementation of the Quizlet intervention started at the beginning of the class, often lasting for about a duration of 20 minutes. Following this, the teacher proceeded with the instruction of the textbook content, incorporating the target words, and subsequently proceeded with the execution of further activities. Participants in the control group received a paper-based word list each class and learn vocabulary using the traditional method. However, the learning activities for the control group were similar, except that the activities involving Quizlet had been replaced with about 20 minutes of practicing vocabulary through writing and reading aloud. The other learning and teaching activities were the same as the experimental group learners experienced. And the two groups received the same teaching strategy to ensure that the two groups received the same

course content. In addition, the two groups read and studied the same teaching materials (Wu, 2018).

3.6.2 Pretest and Posttest Data Collection

The pretest was administered in the fourth week of the second semester of the 2021-2022 academic year, and both experimental and control group participants completed the pretest. Participants were assured that their scores would not count toward their final grade. They were informed that the test aimed to check their receptive and productive knowledge of some vocabulary words. The pretest was divided into two parts; the first part was a productive vocabulary knowledge test with 60 questions and one point for each question; the total score was 60 points. Participants were given 30 minutes to complete the productive vocabulary knowledge test. The receptive vocabulary knowledge pretest was distributed 30 minutes after the productive vocabulary knowledge pretest; the receptive vocabulary knowledge also contained 60 questions and one point for each question; the time limit for participants was 30 minutes.

The posttest was administered in thirteenth week after the participants had completed the study of units three to six with an 8-week intervention. The posttest content was the same as the pretest, but the order of the questions differed from the pretest. The productive vocabulary knowledge posttest was given to both experimental and control group participants first, and 30 minutes after the productive test； the receptive vocabulary knowledge test was given to the participants and the time limit for them to complete the test was 30 minutes. The pretests and posttests were distributed via an online platform called “Xue Xi Tong”. After the participants submitted their test papers, the online

platform automatically gave them marks. then another three experienced college English teachers rechecked the participants' answers to ensure the reliability of the tests.

3.6.3 Questionnaire Data Collection

In the current study, the administration of the questionnaire involved personally distributing it to the students in the experimental group via the online survey platform "Wen Juan Xing". After the participants submitted the posttest paper in the lesson class, they were instructed to complete an online questionnaire in the thirteenth week second lesson of the college English course. Participants in this study were informed that their participation was voluntary, and that study participation and nonparticipation would not affect their final grade. To ensure the respondents well understand the questionnaire item, the researcher went to the participants' classroom during their class time to instruct participants to scan the QR code of the questionnaire and explain how to complete the questionnaire.

3.6.4 Semi-structure Interview Data Collection

The semi-structured interview was administered during the thirteenth week, following the completion of the questionnaire by individuals in the experimental group. A cohort of 24 participants voluntarily participated in the semi-structured interview. The interview platform employed for the study was "Tencent conference software". During the interview, participants exclusively used the audio function while turning off the video feature. Because regarding the non-visual techniques, the lack of facial cues may facilitate the exploration of more delicate topics (Cohen et al., 2018). Additionally, employing such methods can mitigate power imbalances that exist between the interviewer and interviewee

(James, 2016). The researcher's computer was equipped with audio recording software that automatically recorded the auditory content of the interview. Each semi-structured interview was conducted within 15 to 25 minutes, and the entire conversation was recorded and transcribed word for word. After completing the record transcription, the transcripts were sent to the participants to verify the accuracy of their intended expressions. This verification process involved a thorough examination of the transcripts by the researcher.

3.7 Data Analysis Procedures

The present study collected the data through pretests, posttests, questionnaires, and semi-structured interviews. The first part presents the data analysis of pretests and posttests; the second part presents the procedure of questionnaire data, and the third part presents the procedure of interview data.

3.7.1 Data Analysis for Pretests and Posttests

The following matrix in Table 3.24 summarizes the methodological framework of the present study for pretests and posttests.

Table 3.24: Research matrix for pretests and posttests

Research Question	Research Hypothesis	Data Sources	Types of Statistics Used
1.Is there any significant difference in the receptive vocabulary knowledge performance of college EFL students between the Quizlet and non-Quizlet group?	$H_0$1: There is no significant difference in the receptive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.	Posttest	(a) Descriptive: ➢ Means and ➢ standard deviation (b) Inferential: Independent samples *t*-test

Table 3.24 Continued

	H1: There is significant difference in the receptive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.		
2.Is there any significant difference in the productive vocabulary knowledge performance of college EFL students between the Quizlet and non-Quizlet group?	$H_0$2: There is no significant difference in the productive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group. H2: There is significant difference in the productive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.	Posttest	(a) Descriptive: ➢ Means and ➢ standard deviation (b) Inferential: Independent samples *t*-test

As shown in Table 3.24, descriptive and inferential statistics were used to analyse this study's data and draw conclusions. The data collected from the test instrument were summarized using descriptive and inferential statistics to test the study's hypothesis. Research questions one and two were answered in tabular descriptions by means and

standard deviation of the test scores. Sample t-tests were calculated with a confidence interval of 95% ($p < .05$) to test the study's hypothesis.

Research questions one and two in Table 3.24 refer to participants' receptive and productive vocabulary knowledge performance, respectively; the posttest means, and standard deviation of the two groups for receptive vocabulary knowledge scores were compared. Similarly, the posttest means and standard deviations of the Quizlet and None-Quizlet groups for productive vocabulary knowledge were compared. The results would indicate that the group with higher mean scores achieved higher performance in receptive/productive vocabulary knowledge than those with lower mean scores. Therefore, if the Quizlet group in the present study has higher mean scores than the none-Quizlet group, this would indicate that Quizlet is more effective in learning receptive/productive vocabulary knowledge than the paper-based word lists vocabulary learning approach used with the none-Quizlet group.

The independent samples t-test would be used to test the study's acceptance or rejection of $H_0 1$ and $H_0 2$. A predetermined level of significance ($p < .05$) was adopted; $H_0 1$ and $H_0 2$ are either accepted to conclude that there is no significant difference between the means of the two groups or otherwise rejected to conclude that there is a significant difference between the means of the two groups for receptive and productive vocabulary knowledge performance respectively. At the 95% confidence interval of the difference ($p < .05$), if the obtained p-value (p) is greater than .05 ($p > .05$), it suggests that there is no statistically significant difference between the means of the groups at the posttest level. Therefore, the null hypothesis of the study that there is no significant difference in receptive/productive vocabulary knowledge performance would be accepted. The results

would be interpreted as the group with higher mean scores did not perform better than those with lower mean scores. On the other hand, if the Sig. (P) the value obtained is less than .05 (p <. 05), this would indicate that there is a statistically significant difference between the group means at the posttest level and reject the study's null hypothesis of no significant difference in receptive/productive vocabulary knowledge performance between the Quizlet group and the None-Quizlet group. Therefore, the result would indicate that the group with higher mean scores performed significantly better than the group with lower mean scores in receptive/productive vocabulary knowledge performance.

Table 3.25: Skewness and Kurtosis

Subjects	Vocabulary	Test	Skewness	Kurtosis
Experimental	Receptive	Pretest	.678	.033
		Posttest	.198	-.604
	Productive	Pretest	1.802	4.979
		Posttest	.172	-.098
Control	Receptive	Pretest	.382	-.788
		Posttest	.054	-.234
	Productive	Pretest	.539	-.515
		Posttest	.298	-.512

Normality distribution of receptive vocabulary knowledge pretest scores of the experimental group, receptive vocabulary knowledge posttest scores of the experimental group, productive vocabulary knowledge pretest scores of the experimental group,

productive vocabulary knowledge posttest scores of the experimental group, receptive vocabulary knowledge pretest scores of the control group, productive vocabulary knowledge pretest scores of the control group, receptive and productive vocabulary knowledge posttest scores of the control group were tested by tests of normality, the skewness and kurtosis of the test's scores presented in Table 3.25.

Normality can be demonstrated by skewness and kurtosis. In theory, the skewness and kurtosis of the standard normal distribution are both 0. However, most data cannot fit the standard normal distribution, and according to Hair et al. (2010) and Byrne (2010), data are considered normal if the skewness is between ±2 and the kurtosis is between ±7. Table 3.25 shows the skewness of the experimental group's receptive, productive pretest, and posttest scores were .678, .198, 1.802, and .172, respectively. Moreover, the skewness of the control group's receptive, productive pretest and posttest scores were .382, .504, .539, and .298, respectively. The skewness results were all between ±2. Furthermore, the kurtosis of the experimental control group receptive and productive scores were .033, -.604, 4.979, -.098, -.788, -.234, -.515, -.512, respectively. The kurtosis results were all between ±7. Thus, according to Hair et al. (2010) and Bryne (2010), the 8 data sets in Table 3.25 were normal, i.e., they met the normality distribution.

Levene's Test: to test the assumption of homogeneity of variance for receptive vocabulary knowledge.

Levene's test for equality of variance was considered the most robust method for testing the assumption of homogeneity of variance (Cheng & Fan, 2005). The null hypothesis of Levene's test is that there is no difference between the variance of the two groups (H_0: $\delta 21 = \delta 22$; Ha: $\delta 21 \neq \delta 22$). The data results associated with "equal variances

assumed" are used accordingly for data interpretation if the assumption of homogeneity of variance is met (Lee, 2021, p.206). Otherwise, the data results associated with equal variances not assumed are used instead, following Cochran and Cox's (1957) adjustment for the standard error of the estimate and Satterthwaite's (1946) adjustment for the degree of freedom (Lee, 2021). Therefore, the results of a study are determined by the Sig. (p) values obtained in the tests. The results are presented in Table 3.26 as follows.

Table 3.26: Levene's Test for assumption of homogeneity of variance

Subjects	**Vocabulary**	***F***	***Sig.***
Experimental - Control	Pretest	.589	.444
Experimental - Control	posttest	13.345	.000

Table 3.26 presents the F values acquired for the pretest and posttest, which are recorded as 0.589 and 13.345, respectively. The obtained significance (p) value from the pretest of the experimental group, when compared with the pretest of the control group, was .444 ($p > .05$), indicating that the null hypothesis of no difference between the variances of the groups was accepted. This suggests that the assumption of homogeneity of variances was satisfied, and the data outcomes related to the "equal variances assumed" were employed.

The obtained significance (p) value from the posttest of the experimental group, when compared with the posttest of the control group, was found to be .000 ($p < .05$). Consequently, the null hypothesis, which assumes no difference between the variances of the groups, is rejected. This suggests that the assumption of homogeneity of variances was violated, and the data analysis was conducted using the "Equal Variances Not Assumed"

approach. The statement refers to the adjustment made by Cochran and Cox (1957) for the standard error of the estimate, as well as the adjustment made by Satterthwaite (1946) for the standard error associated with the degree of freedom.

Levene's Test for assumption of homogeneity of variance for productive vocabulary knowledge

The Levene's Test for Equality of Variance was employed to examine the assumption of homogeneity of variance. The null hypothesis posits that there is no difference between the variances of the two groups (H_0: $\delta 21 = \delta 22$; Ha: $\delta 21 \neq \delta 22$). The results are tabled as follows in Table 3.27.

Table 3.27: Levene's Test for assumption of homogeneity of variance

Subjects	Vocabulary	*F*	*Sig.*
Experimental - Control	Pretest	.016	.901
Experimental - Control	posttest	6.467	.012

Table 3.27 shows the F values acquired for the pretest and posttest, which were found to be 0.016 and 6.467, respectively. The obtained significance (p) value from the pretest of the experimental group, when compared with the pretest of the control group, was found to be .901 ($p > .05$). As a result, the null hypothesis, which suggests no difference between the variances of the two groups, was accepted. This suggests that the condition of homogeneity of variances was satisfied, and the data associated with the assumption of equal variances were utilized for the analysis. The obtained significance (p) value from the experimental posttest, when compared with the posttest of the control group,

was found to be .012 ($p < .05$). As a result, the null hypothesis, which states that there is no difference between the variances of the groups, was rejected. This finding suggests that the assumption of homogeneity of variances was violated, leading to the utilization of statistical methods that do not assume equal variances. The statement above refers to the adjustment made by Cochran and Cox (1957) for the standard error of the estimate, as well as the adjustment made by Satterthwaite (1946) for the standard error pertaining to the degree of freedom.

3.7.2 Data Analysis for Questionnaire

The data obtained from the questionnaire in this study was processed using version 25 of the Statistical Package for Social Sciences (SPSS). The survey consisted of 32 items that assessed the perceptions of college EFL learners regarding the utilization of Quizlet. The participants were asked to rate their agreement with each item on a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The descriptive statistical analysis yielded results by calculating the overall mean score for each construct. These scores were measured using three distinct ranking values, which were derived from previous studies that examined different facets of learners’ perceptions (Annamalai et al., 2023; Madhumathi & Ghosh 2012; Nariyati et al., 2020; Nuraeni et al., 2020; Prayogi & Soleimani et al., 2014; Wulandari, 2021). Based on the abovementioned previous study, the current study adopted the following mean scores range interpretation as shown in Table 3.28 to determine the different levels of agreement of college EFL learners’ perception of using Quizlet. The mean scores of 1.00 to 2.00 were interpreted as low-level agreement indicating negative perceptions, and between 2.01 and 3.00 were indicators of moderate-level agreement, indicating neutral perceptions. The mean scores of 3.01 to 4.00 were

considered high-level agreement, indicating positive perceptions. The mean scores of 4.01 to 5.00 were indicators of very high-level agreement, indicating a very positive perception.

Table 3.28: Level of perceptions in using Quizlet

Mean range	Level	Interpretation
4.01 to 5.00	Very High-level	Very Positive
3.01 to 4.00	High-level	Positive
2.01 to 3.00	Moderate level	Neural
1.00 to 2.00	Low-level	Negative

The 95 subjects in the experimental group were divided into high and low levels according to the average value of the receptive and productive vocabulary knowledge test scores. The independent samples t-test was conducted to test whether there was a difference between the perceptions of high-level and low-level college EFL learners towards using Quizlet as their English vocabulary learning tool. Forty-seven respondents with an average score of more than 27 in the posttests were taken as the high-level group, and 48 people with an average score of less than or equal to 27 were divided into the low-level group. Before proceeding with the data analysis, a normality test was carried out to check whether the data obtained from the survey were normally distributed or not; if the data were normal, parametric tests could be carried out; if not, non-parametric tests had to be used to analyse the data. In the present study, skewness and kurtosis values were checked.

Test of normality was conducted by examining the skewness and kurtosis scores. The skewness and kurtosis scores of variables of the study can be seen in Appendix H.

Skewness and Kurtosis are numerical values used to explain the data distribution obtained from samples. The Skewness and Kurtosis of a normal distribution are 0. While Hair et al. (2010) and Bryne (2010) argued that data is considered normal if Skewness is between ±2 and Kurtosis is between ±7. In other words, if the Skewness for data distribution is within the range of -2 and +2, and the Kurtosis within the range of -7 and +7, the data distribution is considered to be normal (Hair et al., 2010; Bryne, 2010). In this study, all the items' skewness and kurtosis scores are within the stipulated range. Therefore, the data is considered as normally distributed. And then, descriptive, and inferential statistics were used to present college EFL learners' perceptions of using Quizlet.

3.7.3 Data Analysis for Semi-structured Interview

Thematic analysis was employed to discern the themes and sub-themes pertaining to the perceptions of college EFL learners regarding the utilization of Quizlet as a tool for learning English vocabulary. Thematic analysis can be seen as a foundational method for qualitative analysis; it provides central skills that will be helpful for conducting many other forms of qualitative analysis (Braun & Clarke, 2006). It is a way to identify what is common in how a topic is spoken or written about and make sense of that commonality (Braun & Clark, 2012).

In the present study, for the semi-structured interview recordings, firstly, the video sounds recorded during the semi-structured interview were transcribed by "Xun Jie Voice", a computer-based voice transcription software. Then, the researcher checked every sentence following the semi-structured voice recording on the "Xun Jie Voice" software; after checking all the sentences, the transcriptions were presented to interviewees, and they were allowed to correct and add information to ensure the reliability of the semi-structured

interview, as Cohen et al. (2018) suggested that member checking could enhance the reliability of qualitative research.

After the semi-structured interview voice recordings were transcribed and member checking by the interviewees, thematic analysis in the present study followed Braun & Clarke's (2006) thematic analysis steps:

1. The researcher read the data several times to become comfortable with the semantic meanings and to become acquainted with the data itself. Additionally, the researcher jotted down broad observations that could be useful in developing themes in the future.

2. Subsequently, codes were formulated with the purpose of extracting significant analytical concepts from the data that may have a bearing on the research inquiry. It is vital to reiterate this action to ensure that crucial codes are duly acknowledged.

3. Themes were derived by organizing codes that was associated with a specific concept. The identified themes served to discern recurring patterns of significance within the dataset.

4. The themes were critically examined in relation to both the coded data and the dataset. The utilization of a thematic map facilitated the organization of the analysis and delineates the interconnections among the various themes.

5. The themes were identified and designated with specific names. The researcher formulated an analytical narrative to elucidate the

phenomena observed in the data, establish its connection to the research question, and underscore the significance of this analysis for the reader.

6. The analysis was written up within a report.

There are two main types of thematic analysis: inductive and theoretical or deductive (Braun & Clarke, 2006). The present study used the deductive or theoretical thematic analysis, where the technology acceptance model drove the themes. According to Braun and Clarke (2006), thematic analysis is a versatile method that is not constrained by a predetermined theoretical framework. It can be applied within various theoretical frameworks, although not all, and can serve different purposes within those frameworks. The results of the semi-structured interview produced by the analysis highlight the participants' views on the use of Quizlet as a tool for learning English vocabulary.

The analysis was guided by the Arshad et al. (2012) revised Technology Acceptance Model and followed Braun and Clarke' (2006) thematic analysis processes. There are five main themes emerged according to the Arshad et al. (2012) revised Technology Acceptance Model: *actual usage, perceived usefulness, perceived ease of use, attitude, and behavioural intention*.

Actual usage:

The initial themes for *actual usage* were "use at least three times weekly", "use at least four times weekly", and "practice in class time", which were refined to "use at twice weekly" as a subtheme. The initial theme, "statement about practice order" was subsequently categorized as the subtheme "flashcard module was firstly used". The initial

themes, “vocabulary knowledge has been improved” and “understand more words” were further developed and refined into “improving vocabulary knowledge” as a subtheme.

Perceived usefulness:

The initial themes pertaining to “better remembering and understanding words” and “deeply remembering words” were subsequently refined into a subtheme of “improve learning effects”. The initial themes of “show misspellings instantly” and “memorize words quickly” were refined to a subtheme of “improve learning efficiency”. The initial themes pertaining to “improve reading skill”, “improve listening skill”, “improve speaking skill”, and “improve writing skill” were subsequently consolidated into a subtheme focused on “improving language skills”.

Perceived ease of use Quizlet:

The initial themes of “interface clear and understandable” and “simple and easy” were subsequently consolidated into a subtheme referred to as “user-friendly”. The initial themes, namely “operation is easy”, “use easily” and “to be skilful effortlessly” were further developed and refined into a subtheme called “easy to become skilful in using Quizlet”. The initial themes of “learning a word are easy with pictures” and “diverse module makes word learning easy” were further developed and refined into the subtheme of “easy learning vocabulary”.

Attitude:

The main theme for *attitude* was firstly divided into “positive attitude” and “negative attitude” two subthemes, and then based on the initial themes, more detailed subthemes were identified.

Positive attitude:

The initial themes of “free of charge”, “allowing users to create their own set of words”, and “usable at any time and place” were further developed into the subtheme of “convenience”. The initial “test vocabulary” theme was further developed into a subtheme of “knowing mastery of vocabulary”. The initial themes pertaining to “relaxed and fun classroom atmosphere”, “development of student’s interest in learning”, “establishment of enjoyment” and “reduce learning stress” were further refined into a subtheme of “providing enjoyable learning”. The initial themes, which included “previewing words on Quizlet without supervision”, “generating learner autonomy” and “redoing *match module* practice until satisfied” were subsequently refined to a subtheme focused on “promoting learner autonomy”.

Negative attitude:

The initial themes, namely “need more game modules”, “require showing phonetic symbols” and “need illustrating example sentences” were subsequently refined and categorized under the subtheme of “insufficient features”. The initial theme, “internet connection getting stuck easily in the classroom”, was further delineated and categorized as a subtheme, specifically referred to as “network issues”. The initial theme, “sometimes advertisements pop up during learner’s learning” was further developed and categorized as a subtheme referred to as “advertising interference”. The initial themes of “repeat many times practice of words errored” and “heavy learning burden” were further developed and refined into a subtheme of “too much repetition”.

Behavioural intention:

The initial themes “create own vocabulary flashcards to prepare some English tests” and “motivate learners to learn independently” were further developed into a subtheme, “intend to use Quizlet in the future”. The initial themes “simple words would not use Quizlet to learn”, “prefer traditional learning method”, and “use other mobile application” were refined to “reluctant to use Quizlet in the future”.

As previously stated, the current study employed the method of thematic analysis. Initial codes were generated, followed by an analysis of the relationship between themes and sub-themes. The meaningfulness and distinctiveness of the themes were then carefully reviewed prior to their finalization. The sample thematic coding process can be seen in Appendix I.

The researcher conducted semi-structured interviews in Chinese to ensure an efficient understanding of the questions and accurate expression of the interviewees’ intended answers. Following the process of member-checking the semi-structured interview transcripts, the researcher proceeded to translate the Chinese version into English. Subsequently, the translations underwent scrutiny by peers check that three college English teachers with expertise in English translation and a minimum of five years of experience in teaching English at the college level. Parts of the semi-structured interview transcripts were selected for translation, specifically focusing on sections relevant to the research question. Excerpts were not translated, which contained repetitive information or were unrelated to the research topic, such as greetings and other non-substantive exchanges.

3.8 Ethical Issues

Each stage in the research sequence raises ethical issues; ethical research concerns what researchers should and should not do (Cohen et al., 2018). Educational researchers

need to consider the impact of research on participants; researchers need to protect research participants and guard against misconduct and impropriety that may reflect on their organizations or institutions (Creswell, 2014). Furthermore, Leavy (2017) also emphasized that protecting participants who do not harm is the main principle for protecting research participants, and this protection is extended to the environment in which the research takes place.

Before embarking on the present study, permission had been obtained from the institution where the research conducted. The consent form of the institution, as seen in Appendix J. As Cohen et al. (2018) emphasize the need to access the institution or organization where the research is to be conducted before embarking on the task. Creswell (2014) also highlighted the importance of obtaining permission from the site and participants. Ary et al. (2010) further state that it is prudent to obtain permission, especially if the researcher wishes to represent the findings to others outside the local context or even publish them. The purpose of this study was explained in the consent form submitted to the research site, and it was clearly explained that this study would not harm the research site and participants. Cohen et al. (2018) state that researchers should provide as much information as is appropriate about the study's purpose, nature, and procedures. This is important in the process, as it may be necessary to withhold information that could affect the research outcome. The consent form of participants was shown as Appendix K, including the study's purpose, nature, and procedure.

A consent form was provided to participants before the study was conducted. It was also made clear to the participants that there was no penalty for refusing to participate and that the student's grades would not be affected by their decision to participate. Cohen et al.

(2018) stated that the principle of informed consent concerns autonomy; participants have the right to freedom and self-determination. Self-determination requires that participants have the right to weigh the risks and benefits of participating in research and decide for themselves whether to take part (Howe & Moses, 1999). Moreover, participants can refuse to participate or withdraw even after the research has begun. Consent must be given voluntarily and without pressure (Kumar, 2012; Robert, 1989).

The detailed research procedures and the aim of the research were only offered to the college where the research was conducted but were kept from the participants to prevent the participants from intensely memorizing the target words to influence the study results. Although many researchers (Creswell, 2014; Howe & Moses, 1999; Kumar, 2012; Robert, 1989) stated that it is necessary to inform the participants about all the information related to the study, in practice, it is often impossible or even undesirable for researchers to inform the participants about everything (Cohen et al., 2018). In the study by Frankfort-Nachmias and Nachmias (2014), who argued that it is not always necessary to inform participants of all information, deception may be justified in some circumstances. Deception is related to not telling participants they are being studied, not telling the truth, or withholding some or all information about the study (Cohen et al., 2018).

One way to address privacy and protection from harm is through anonymity, meaning that the information provided by participants should not reveal their identity in any way (Cohen et al., 2018). The identity information of the participants in this study would not be disclosed except to the researcher and her supervisors. In the report of the results of the semi-structured interviews, the names of the interviewees were replaced by numerical numbers. According to Oliver (2003), it is common practice for researchers to

maintain two parallel lists, one containing the real names of participants and the other containing the corresponding coded names, regardless of whether fictitious names, letters, or numbers are used for anonymization purposes. This practice is often necessary during the writing of a research report or thesis. Bell (2010) also stated that all participants must be allowed to remain anonymous for the school-based research project. Researchers separate the identity of the participants from the information they provide. Anonymity can be provided if the researcher or others cannot identify a piece of specific information with a particular participant. A participant is considered anonymous. The level of anonymity can be heightened by associating names and other identifying details with the information through the utilization of a code number (Frankfort-Nachmias et al., 2014). In preparing the data for analysis, the identifying information were separated from the primary data file to maintain anonymity, as Frankfort-Nachmias et al. (2014) suggested.

In the present study, all information/data provided by the participants were assured of complete confidentiality. In the realm of social science research, it is customary to inform participants that the data they provide will be handled with utmost confidentiality. This implies that while researchers may possess the ability to link the acquired information to specific participants, they are bound by ethical guidelines to refrain from disclosing it publicly (Frankfort-Nachmias et al., 2014). As Kumar (2012) states, sharing information with others for purposes other than research is unethical. While the researcher may possess knowledge regarding the source of information or the ability to identify participants based on the provided data, it is important to note that the current study's research would not disclose or publicize any such associations. It is also unethical to share information about the respondents with others for purposes other than research (Kumar, 2012). Therefore, in

the present study, any information or data provided by the participants will not be used for any other purpose.

3.9 Limitation

Like numerous academic investigations, the present study possesses certain limitations. Hence, it is advisable to exercise caution when interpreting the findings of the present study. The research employed a non-equivalent group pretest-posttest quasi-experimental design, which, despite its drawbacks, imposed limitations on the study because of the inherent threats it posed to both external and internal validity. Selection bias emerged as a fundamental threat to internal validity. The researcher employed a purposive sampling technique and employed random assignment to allocate classes into groups. Nevertheless, the researcher encountered a constraint in the form of selection bias as random assignment of students within these groups was not feasible.

The study used purposive sampling; the generations made should be rationalized, and the representativeness should be limited only to the distinct cohort (Lee, 2021). The present study used intact groups in the form of intact classes, which is considered appropriate given the nature of the study. In the current study, the subjects consisted of Year 1 college EFL learners. Therefore, it may not be generalizable to those in other groups. There is a risk of contamination due to the interaction between the subjects as two intact classes, the experimental and the control groups, were used in the study. College EFL learners in the experimental group may have shared their activities with those in the control group. Therefore, it is necessary to "blind" the subjects (Lee, 2021).

Due to the limited time available in a semester, students must prepare for their final exams after taking the posttest, so they did not have time to take the delayed posttest.

Whether Quizlet is more effective than traditional vocabulary learning regarding receptive and productive vocabulary retention has not been tested. Webb (2005) posits that relying on just a receptive or productive test for assessing vocabulary acquisition may yield potentially deceptive findings. The current study adopted receptive and productive test forms to investigate the effectiveness of Quizlet on college EFL learners' vocabulary achievement. However, the present study only focused on form and meaning and did not include other aspects of vocabulary knowledge. According to Rasti & Shahbazi (2020), there have been conflicting findings in the literature on digitally based vocabulary learning when the multidimensionality of word knowledge was disregarded, and only receptive/productive knowledge of meaning was measured.

A limitation of the current study is that the researcher only measured one aspect of vocabulary knowledge (meaning and form) and did not measure other aspects of vocabulary knowledge. Much knowledge of vocabulary needs to be known rather than only word meaning and form (Nation, 2001). It is unclear what the effects of using Quizlet might be on the different aspects of vocabulary knowledge. Measuring different aspects of vocabulary receptively and productively is likely to provide a much more accurate assessment of the effectiveness of Quizlet on other aspects of vocabulary.

3.10 Summary

This chapter presented the research design, study participants, sampling techniques, and data analysis method. Table 3.29 showed the summary of the research design, Table 3.30 demonstrated the summary of the sampling technique and participants, and Table 3.31 illustrated the summary of the data analysis method.

Table 3.29: Summary of research design

Design	Method		Instrument	Research Question
Mixed method	Quasi-experimental	Quantitative	Pre-posttests	Address research question 1 and 2
	Web-based questionnaire	Quantitative	Questionnaire items	Address research question 3
	Semi-structured interview	Qualitative	Interview protocol	

Table 3.30: Summary of sampling and participants

	Participants	Sampling
Quasi-experimental	191 (Experimental n = 95, Control n = 96)	Purposive
Web-based questionnaire	95 (Experimental group)	Purposive
Semi-structured interview	24 (Experimental group)	Purposive

Table 3.31: Summary of data analysis method

	Data	analysis
Quasi-experimental	Pre-posttest scores	Descriptive and inferential (Standard deviation, and independent sample t-test)
Web-based questionnaire	5-likert scale	Descriptive and inferential (Standard deviation, independent sample t-test)
Semi-structured interview	Interview transcripts	Thematic analysis

The chapter has detailed the methods used in this research, including developing the research instrument, the data collection methods, and the pilot study. It also outlined the methods and approaches used to conduct the main study. The types and sources of data

have been explained, including methods of data analysis and assessment of reliability and validity. Ethical issues are also discussed at the end of the chapter.

CHAPTER 4

FINDING

4.1 Chapter Overview

This chapter first reports the data obtained from the productive pre-posttests and receptive pre-posttests, which were duly administered to measure the participants' receptive and productive vocabulary knowledge, respectively. The data collected from the pre-posttests were descriptively described via means and standard deviation and then described inferentially by independent sample t-test. Then, it reports the data obtained from the questionnaire (described descriptively and inferentially) and semi-structured interview (described via themes), which were conducted to investigate the perception' of participants on using Quizlet as their vocabulary learning tool. The findings were presented based on the research questions.

4.2 Research Objectives and Research Questions

This study aimed to examine the effects of using Quizlet in vocabulary learning among college EFL learners in Shandong Province, China, and investigate their perceptions of using it in language learning. Regarding the aim of the study, the following are the objectives:

1. To examine the effect of Quizlet-based vocabulary learning on the receptive vocabulary knowledge of college EFL students.
2. To examine the effect of Quizlet-based vocabulary learning on the productive vocabulary knowledge of college EFL students.

3. To investigate the perceptions of college EFL learners regarding the use of Quizlet as an English vocabulary learning tool.
4. To compare the perceptions of high and low-proficiency college EFL learners regarding the use of Quizlet as an English vocabulary learning tool.

The research questions are as follows:

1. What are the effects of Quizlet-based vocabulary learning on the learners' receptive vocabulary knowledge?
2. What are the effects of Quizlet-based vocabulary learning on the learners' productive vocabulary knowledge?
3. What are the perceptions of college EFL learners regarding the use of Quizlet as a tool for learning English vocabulary?

    a. What are the learners' perceptions of the actual system usage of Quizlet?

    b. What are the learners' perceptions of the usefulness of Quizlet?

    c. What are the learners' perceptions of the ease of use of Quizlet?

    d. What are the learners' attitudes toward using Quizlet?

    e. What are the learners' behavioral intentions toward using Quizlet?

4. Is there a difference between high and low-proficiency college EFL learners regarding their perceptions of Quizlet as a tool for learning English vocabulary?

    a. Is there a difference between high and low-proficiency learners in their perceptions of the actual system usage of Quizlet?

b. Is there a difference between high and low-proficiency learners in their perceptions of the usefulness of Quizlet?

c. Is there a difference between high and low-proficiency learners in their perceptions of the ease of use of Quizlet?

d. Is there a difference between high and low-proficiency learners in their attitudes toward using Quizlet?

e. Is there a difference between high and low-proficiency learners in their behavioral intentions toward using Quizlet?

4.3 The Findings Based on the Research Questions

This study has four research objectives; the first and second research objectives each have one associated research questions. There are five sub-research questions for the third and fourth research objective, respectively. The following are the research findings according to the research questions.

4.3.1 The Effects of Quizlet-based Vocabulary Learning on the Learners' Receptive Vocabulary Knowledge

To answer the first research question, "what are the effects of Quizlet-based vocabulary learning on the learners' receptive vocabulary knowledge?", the receptive vocabulary posttest scores were tabulated, and an independent samples t-test was conducted to compare the posttest vocabulary scores between groups to test the effectiveness of the adapted Quizlet approach to receptive vocabulary knowledge learning. The pretest scores were first analysed to check for baseline similarity between the two

groups. Table 4.1 demonstrates the mean scores of the pretest for receptive vocabulary in both the experimental and control groups.

Table 4.1: Descriptive statistic of pretest for baseline similarity between groups

	Experimental		**Control**	
Test	*M*	*SD*	*M*	*SD*
Pretest	9.29	7.31	10.09	7.51

According to the data presented in Table 4.1, the average pretest scores for both the experimental and control groups exhibit minimal disparity, indicating a comparable starting point. The mean pretest score for the experimental group is 9.29 (*SD* = 7.31), while the mean pretest score for the control group is 10.09 (*SD* = 7.51). A statistical analysis was conducted using an independent samples t-test to assess whether there was of statistical significance between the means of two groups in a pretest, with an alpha level of .05. Table 4.2 shows the statistical analysis findings derived from the pretest.

Table 4.2: Independent sample *t*-test of pretest for significant difference between groups

	Levene's Test for Equality of Variances		*T*-test for Equality of Means						
Equal variances	*F*	*Sig.*	*t*	*df*	Sig. 2-tailed	*Mean Diff.*	*SE Diff.*	95% Confidence Interval of the Difference	
								Lower	Upper
Assumed	.589	.444	-.745	189	.457	.799	1.07	-2.91	1.31
Not assumed			-.745	188.9	.457	.799	1.07	-2.91	1.31

Notes: $\alpha = .05$

The null hypothesis of no significant difference in receptive vocabulary knowledge pretest between groups was tested using Levene's Test for Equality of Variances, as shown in Table 4.2. The obtained significance value ($p > .05$) at p = .457 indicates that there is no statistically significant difference between the means of the groups at the pretest level. The acceptance of the null hypothesis of no significant difference in receptive vocabulary knowledge between the Experimental and Control group at the pretest level indicates that there is a baseline similarity between the two groups. The mean scores for the Experimental and Control group at the pretest level were 9.29 (*SD*=7.31) and 10.09 (*SD*=7.51), respectively.

The posttest scores were tabled and compared for differences in receptive vocabulary knowledge between groups. The posttest mean scores of the groups are as follows in Table 4.3.

Table 4.3: Descriptive statistics of posttest for receptive vocabulary knowledge

	Experimental (n = 95)		**Control (n = 96)**	
Test	*M*	*SD*	*M*	*SD*
Posttest	27.48	12.09	15.82	8.84

The data presented in Table 4.3 displays the mean scores for the Experimental group (n=95, M = 27.48, SD = 12.09) and the control group (n = 96, M = 15.82, SD = 8.84) in the posttest. The Experimental group exhibited a significantly higher mean score of 27.48 (SD = 12.09) in comparison to the Control group's mean score of 15.82 (SD = 8.84), indicating that the Experimental group demonstrated superior performance in terms of receptive vocabulary knowledge. Results indicate that the subjects who underwent the

adapted Quizlet intervention experienced greater receptive vocabulary knowledge performance than those in the Control group.

The findings indicate the performance of the Experimental and Control groups in terms of receptive vocabulary knowledge, thus addressing the initial research question (RQ 1). In terms of receptive vocabulary knowledge learning, the Experimental group demonstrates superior performance compared to the Control group.

Hypothesis 1

$H_0$1: There is no significant difference in the receptive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.

H1: There is significant difference in the receptive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.

To address the first hypothesis ($H_0$1), an independent samples *t*-test was employed to evaluate the difference between group means at the posttest of receptive vocabulary knowledge performance at an alpha level of .05. The independent samples t-test yielded evidence to reject the null hypothesis, indicating a significant difference in receptive vocabulary knowledge performance between the experimental and control group. The analysis of the collected data reveals statistically significant disparities in the performance of the Experimental and Control groups in terms of receptive vocabulary knowledge. Table 4.4 presents the statistical analysis of the obtained results.

Table 4.4: Independent sample t-test of posttest for significant difference in receptive vocabulary knowledge performance

	Levene's Test for Equality of Variances		*T*-test for Equality of Means						
Equal variances	*F*	*Sig.*	*t*	*df*	Sig. 2-tailed	*Mean Diff.*	*SE Diff.*	95% Confidence Interval of the Difference	
								Lower	Upper
Assumed	13.345	.000	7.611	189	.000	11.66	1.532	8.638	14.683
Not assumed			7.598	172	.000	11.66	1.534	8.632	14.690

Notes: $\alpha = .05$

According to the data presented in Table 4.4, the obtained Sig. (*p*) value was found to be less than .05 ($p < .05$) at $p = .000$, suggesting that there are statistically significant differences between the Experimental and Control groups at the posttest stage. This finding supports the rejection of the null hypothesis ($H_0 1$) which states that there is no significant difference in the performance of receptive vocabulary knowledge between the Quizlet group and the non-Quizlet group. Instead, it provides evidence in favour of the alternative hypothesis (H1) which suggests that there is indeed a significant difference in the receptive vocabulary knowledge performance between the Quizlet group and the non-Quizlet group.

The statistical analysis indicated that the test yielded a significant result ($t = 7.598$, df = 172, $p = .000 < .05$), leading to the rejection of the null hypothesis ($H_0 1$) which stated that there was no significant difference in the posttest scores. Furthermore, it is worth noting that the 95% confidence interval for the mean of the posttest scores related to receptive vocabulary knowledge was observed to range from 8.632 to 14.690. The confidence interval in question does not include the value of 0, thereby suggesting that the

null hypothesis, which posits the absence of a statistically significant relationship between the variables, is not supported. Therefore, the intervention experienced by the subjects has resulted in positive gain scores in their vocabulary acquisition.

The statistics indicate that the Experimental group (M = 27.48, SD = 12.09) performed significantly higher in the receptive vocabulary knowledge posttest than the Control group (M = 15.82, SD = 8.84). The findings of this study indicate that college EFL learners who were exposed to the Quizlet method exhibited significantly enhanced performance in receptive vocabulary knowledge compared to the Control group, which did not receive instruction through the Quizlet method, during the intervention period.

4.3.2 The Effects of Quizlet-based Vocabulary Learning on the Learners' Productive Vocabulary Knowledge

To address the second research question, the posttest scores were recorded, and an independent sample t-test was performed to compare the posttest vocabulary scores between groups. This was done to assess the effectiveness of the Quizlet-based method in facilitating the acquisition of productive vocabulary knowledge. The initial analysis involved examining the pretest scores to assess the degree of similarity at baseline between the two groups. Table 4.5 demonstrates the mean scores of the Experimental and Control groups in terms of their productive vocabulary knowledge.

Table 4.5: Descriptive statistic of pretest for baseline similarity between groups

	Experimental		**Control**	
Test	*M*	*SD*	*M*	*SD*
Pretest	8.58	7.17	9.14	5.95

According to the data presented in Table 4.5, the average scores of the pretest for both the Experimental and Control groups exhibit minimal variation, indicating a comparable starting point at 8.58 (*SD*=7.17) and 9.14 (*SD*=5.95), respectively. A statistical analysis was conducted using an independent samples t-test with an alpha level of .05 to examine the presence of statistical significance between the means of the pretest groups. The statistical analysis findings of the pretest are presented in Table 4.6.

Table 4.6: Independent sample *t*-test of pretest for significant difference between groups

	Levene's Test for Equality of Variances		*T*-test for Equality of Means						
Equal variances	*F*	*Sig.*	*t*	*df*	Sig. 2-tailed	*Mean Diff.*	*SE Diff.*	95% Confidence Interval of the Difference	
								Lower	Upper
Assumed	.016	.901	-.584	189	.560	-.556	.953	-2.436	1.323
Not assumed			-.583	182	.561	-.556	.954	-2.438	1.326

Notes: $\alpha = .05$

The null hypothesis of no significant difference in productive vocabulary knowledge pretest between groups was tested using Levene's Test for Equality of Variances, as shown in Table 4.6. The obtained significance value ($p = .560$) was greater than the predetermined alpha level of .05, indicating that there was no statistically significant difference between the means of the groups at the pretest stage. The acceptance of the null hypothesis is facilitated by the absence of a significant difference in productive vocabulary knowledge between the Experimental and Control group at the pretest level. This indicates that there is a baseline similarity in vocabulary knowledge, with mean scores

of 8.58 (*SD*=7.17) and 9.14 (*SD*=5.95) for the Experimental and Control group, respectively.

The posttest scores were tabulated and analysed to assess potential disparities in productive vocabulary knowledge across different groups. Table 4.7 illustrates the mean scores of the groups after the posttest.

Table 4.7: Descriptive statistics of posttest for productive vocabulary knowledge

	Experimental (n = 95)		**Control (n = 96)**	
Test	*M*	*SD*	*M*	*SD*
Posttest	28.43	12.93	19.84	10.65

Table 4.7 shows the posttest mean scores for the Experimental group (n=95, *M* = 28.43, *SD* = 12.93) and the control group (n = 96, *M* = 19.84, *SD* = 10.65). The Experimental group showed a higher mean score at 28.43 (*SD* = 12.93) compared to the Control group at 19.84 (*SD* = 10.65), denoting the experimental group's more extraordinary productive vocabulary knowledge performance. Results indicate that the subjects that underwent the Quizlet intervention experienced more excellent productive vocabulary knowledge performance than those in the Control group.

The findings indicate the performance of productive vocabulary knowledge between the Experimental and Control groups, thus addressing the second research question (RQ 2) raised. In terms of productive vocabulary knowledge learning, the Experimental group exhibited greater achievement compared to the Control group.

Hypothesis 2

$H_0$2: There is no significant difference in the productive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.

H2: There is significant difference in the productive vocabulary knowledge performance of college EFL learners between the Quizlet and non-Quizlet group.

Table 4.8: Independent sample t-test of posttest for significant difference in productive vocabulary knowledge performance

	Levene's Test for Equality of Variances		*T*-test for Equality of Means						
Equal variances	*F*	*Sig.*	*t*	*df*	Sig. 2-tailed	*Mean Diff.*	*SE Diff.*	95% Confidence Interval of the Difference	
								Lower	Upper
Assumed	6.467	.012	5.011	189	.000	8.587	1.713	5.207	11.968
Not assumed			5.006	181.6	.000	8.587	1.715	5.202	11.972

Notes: $\alpha = .05$

To examine the first hypothesis ($H_0$2), a statistical analysis known as an independent samples t-test was utilized to assess the disparity between the means of two groups in terms of their performance on a posttest measuring productive vocabulary knowledge. This analysis was conducted with a significance level of .05. The independent samples t-test was utilized to examine the null hypothesis that there is no statistically significant difference in the performance of productive vocabulary knowledge between the experimental group and the control group. The analysis of the collected data reveals statistically significant disparities in the performance of productive vocabulary knowledge between the Experimental and Control groups. Table 4.8 presents the statistical analysis of the obtained results.

According to the data showed in Table 4.8, the obtained Sig. (p) value was less than .05 ($p < .05$) at $p = .000$, suggesting that there are statistically significant differences between the Experimental and Control groups at the posttest level. This finding supports the rejection of the null hypothesis ($H_0 2$) which states that there is no significant difference in the productive vocabulary knowledge performance between the Quizlet group and the non-Quizlet group. Instead, it supports the acceptance of the alternative hypothesis (H2) which suggests that there is indeed a significant difference in the productive vocabulary knowledge performance between the Quizlet group and the non-Quizlet group.

The statistical analysis of the data revealed a significant result ($t = 5.006$, $df = 181.6$, $p = .000 < .05$), leading to the rejection of the null hypothesis ($H_0 2$) which stated that there was no significant difference in the posttest scores. The 95% confidence interval for the mean scores on the posttest measuring productive vocabulary knowledge ranged from 5.202 to 11.972. The confidence interval in question does not include the value of 0, which suggests that the null hypothesis, asserting the absence of a statistically significant relationship between the pair of variables, is not supported. Consequently, the subjects' vocabulary knowledge acquisition has exhibited positive gain scores as a result of the intervention they underwent.

According to the statistical data, the Experimental group demonstrated a significantly higher level of performance in the posttest for productive vocabulary knowledge ($M = 28.43$, $SD = 12.93$) compared to the Control group ($M = 19.84$, $SD = 10.65$). The findings of the study indicate that college students learning English as a foreign language exhibited notably enhanced productive vocabulary knowledge performance when they were exposed to the Quizlet method. This improvement was

observed during the intervention period and was found to be significantly superior to the performance of the Control group, which did not receive instruction through the Quizlet method.

4.3.3 Perceptions of College EFL Learners regarding the Use of Quizlet as an English Vocabulary Learning Tool

In this section, the findings analysed from the quantitative data were presented first, and then the findings analysed from the qualitative data were presented later to cross-validate the results of learners' perceptions of using Quizlet. The quantitative data were collected using a web-based questionnaire, while the qualitative data was collected through semi-structured interviews.

4.3.3.1 Perceptions on the actual system usage of Quizlet

This part addresses the research question: What are the college EFL learners' perceptions of the actual system usage of Quizlet?

Table 4.9: Mean of Actual system usage

Items	Mean	Std. Deviation	Interpretation
1. After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.	3.78	0.97	Positive
2. I believe that using Quizlet can improve my English vocabulary knowledge.	4.24	0.70	Very positive
3. I believe that using Quizlet can improve my English language competency.	4.01	0.76	Very positive
4. I believe that using Quizlet can increase my English receptive vocabulary knowledge.	4.16	0.67	Very positive
5. I believe that using Quizlet can increase my English productive vocabulary	4.16	0.69	Very positive

Table 4.9 Continued

knowledge.			
Actual system usage	4.07	0.61	Very positive

Notes: Mean range from 1 to 5

Table 4.9 shows the actual system usage of Quizlet; the average means (*M=4.07, SD=.61*) for the actual system usage of Quizlet among college EFL learners above the 4.01. This result indicated that, overall, college EFL learners had a very positive attitude toward the actual system usage of Quizlet.

After finishing the vocabulary practice assignment on Quizlet, the subjects were not very positive on using Quizlet learning vocabulary as the mean of Item 1(*M*=3.78, *SD*=.97) above 3.0 but below 4.00. While the mean scores of Items 4 and Item 5 regarding Quizlet could improve their receptive and productive vocabulary knowledge both above 4.01. This indicated that the subjects had a very positive attitude towards the actual usage of Quizlet on the point that using Quizlet can increase their English receptive vocabulary knowledge and productive vocabulary knowledge (both Item 4 and Item 5 means 4.16). This means that the subjects believed using Quizlet could improve their receptive and productive vocabulary knowledge when they used Quizlet as an English vocabulary learning tool.

Themes on actual usage of Quizlet

Three sub-themes were summarized from the participants' semi-structured interview transcripts about actual usage of Quizlet, that was, using at least twice weekly, Flashcard module was firstly used and improving vocabulary knowledge as shown in Table 4.10.

Table 4.10: Themes for actual usage

Main Theme	Subtheme
Actual usage	Use at least twice weekly
	Flashcard module was firstly used
	Improving vocabulary knowledge

Use at least twice weekly When asked how often they used Quizlet to learn vocabulary every week, most participants stated that they used it four times every week, generally. They had two classes per week, and they learned vocabulary on Quizlet as their teacher instructed; in the classroom and after class, they completed the assignment of vocabulary learning on Quizlet twice. The statement of Student 1 is shown as follows.

> Student 1: *Yes, I followed the teacher's instructions and learned vocabulary each class on the Quizlet. Well, I have not missed any of the Quizlet exercises in class. That is, I do my vocabulary-learning exercises on the Quizlet on time every week, including my teacher-assigned assignments on Quizlet.*

Student 1 emphasized that she had always followed the teacher's instructions to learn vocabulary on Quizlet and always attended all the vocabulary-learning exercises, both classroom exercises and after-class teacher-assigned assignments, that is, doing vocabulary practice on Quizlet.

> Student 14: *Well, I use Quizlet to learn vocabulary in class as the teacher instructed, and then I would do it several times after class. Usually, I do it before class, during class and after class.*

Student 23: *I finished my first-time vocabulary study on the Quizlet when I returned to my dorm after class. Also, I did it again before the next class. I practice on the Quizlet a lot to better grasp the vocabulary.*

Students 14 and 23 additionally stated that they did vocabulary learning in class as instructed by their teachers and did vocabulary learning on Quizlet more than once. As student 14 described, she would do vocabulary study several times on the Quizlet before and after class. Student 23 also described the same situation: she would do vocabulary study on the Quizlet after class and again before the next class. The data analysis showed that most participants used Quizlet to learn words as instructed by their teachers and completed vocabulary assignments on Quizlet more than once after class; that was, participants used Quizlet for vocabulary learning at least twice per week during the semester.

Flashcard module was firstly used Several modules are available on Quizlet for learners to use to learn vocabulary. Most participants used all modules of Quizlet to learn the vocabulary. Student 22 stated that she would typically first look at the flashcards to see how many words she already knew and then used the different modules according to the order of the modules on the Quizlet. If, after learning on the Quizlet, there were still words she did not remember, she would repeat the operation of all the modules.

Student 22: *In class, I look at flashcards. It has a learning module. First, look up how many words I know, then use the write module, following the order of the modules on Quizlet to practice. Finally, the test module is used. If there are some words I have not mastered, I can go back to the previous modules and learn the words again.*

Student 13 further stated that each module of Quizlet helped him strengthen vocabulary memory. He described that the Flashcard module helped him getting familiar with words to remember them better, and the Write module further strengthened his memory of words. The Match module will help master the Chinese meaning of the vocabulary, and the Test module is used last to get better scores. Furthermore, student 13 also stressed that using Quizlet helped him learn words more quickly and was much more convenient for him than traditional vocabulary learning.

> Student 13: *I used Flashcard and Study modules first. The Match module was then used, and the Test module was finally completed. I could remember words better as flashcards helping me be familiar with them. The Write module was able to enhance my memory of words. The Match module could be used to practice matching English words with Chinese meanings. I would have had better results if I had taken the test module. In fact, each module of Quizlet helped me to enhance my memory of words, and it allowed me to memorize words more quickly, which was much more convenient than traditional vocabulary learning.*

Improving vocabulary knowledge Most participants emphasized that their vocabulary knowledge was improved with the help of Quizlet. Student 16 stated that her vocabulary knowledge had been improved and explained that the pictures or something like that on Quizlet could help her remember words faster than before.

> Student 16: *My vocabulary knowledge has been improved because there are pictures or something like that on Quizlet. I think Quizlet makes me*

remember words faster. I'm not good at memorizing words but I look at the pictures on Quizlet, sometimes I can remember words.

Student 3 further described Quizlet as beneficial to her productive vocabulary learning. And she explained that the write module on the Quizlet let the learner spell words several times. As a result, when she wants to write certain words, she could spell them correctly.

Student 3: *Well, I think it is suitable for productive vocabulary knowledge. The Quizlet Write module will let me spell words many times, and then after completing the vocabulary learning via Quizlet, I usually remember how to write the words.*

Student 9 also highlighted that receptive and productive vocabulary knowledge had been improved by using Quizlet to learn vocabulary. However, Student 9 also explained that using Quizlet benefited her receptive vocabulary learning as she felt she understood more than she could write.

Student 9: *Well, I think both receptive and productive vocabulary knowledge was improved. However, I could understand more words than I could write, in other words, Quizlet is more conducive to receptive vocabulary.*

On language competency, most participants agreed that their language competency had improved. Most participants stated their reading skills improved after using Quizlet as a college English vocabulary learning tool. For example, Student 20 stated that Quizlet improved her reading and writing skills. She also explained that she could

understand most of the words that appeared in the passage. Moreover, she could write more words than she could without using the Quizlet.

> Student 20: *My reading and writing skills have been improved by Quizlet. That is, when I read a short passage, I may understand most of the words that appear in the passage. Sometimes I could not write a word, but after learning the vocabulary on the Quizlet, I could spell more words.*

Student 19 emphasized that her listening skills also be improved with using Quizlet. She explained that every word on Quizlet can be pronounced as it is clicked. Therefore, it would help her learn the correct pronunciation of words and also help her better understand English.

> Student 19: *I think my listening skills would be improved with Quizlet. Because all the words on Quizlet can be pronounced as it were clicked. It helps me to learn the correct pronunciation, which is beneficial for understanding English.*

After eight weeks of actual usage of the Quizlet, participants experienced vocabulary learning with the Quizlet, and some of the interviewed participants expressed their opinions on the actual usage of the Quizlet in their college English classes and after class. Typically, all participants used Quizlet to learn English vocabulary twice a week and at least once after a college English class. Participants perceived the usefulness of Quizlet for their vocabulary knowledge and English language skills during their actual usage of Quizlet for eight weeks.

4.3.3.2 Perceptions on the perceived usefulness of Quizlet

This part addresses the question: What are the college EFL learners' perceptions of the usefulness of the Quizlet?

In Table 4.11, the results for the mean of College EFL learners' perceived usefulness of Quizlet shows the overall mean was 3.81 (*SD* =0.64), above the 3.01 but below 4.00, which indicated that College EFL learners had a positive attitude towards the usefulness of Quizlet.

Table 4.11: Mean of the perceived usefulness of Quizlet

Items	Mean	SD	Interpretation
1. Quizlet helped me learn English vocabulary more quickly.	4.18	0.71	Very positive
2. My Receptive vocabulary knowledge was improved by using Quizlet.	4.18	0.70	Very positive
3. My Productive vocabulary knowledge was improved by using Quizlet.	4.17	0.68	Very positive
4. The use of Quizlet helped me to improve my reading skills.	3.62	0.85	Positive
5. The use of Quizlet helped me to improve my writing skills.	3.38	0.95	Positive
6. The use of Quizlet helped me to improve my speaking skills.	3.55	0.90	Positive
7. The use of Quizlet helped me to improve my listening skills.	3.60	0.86	Positive
Perceived usefulness	3.81	0.64	Positive

Notes: Mean range from 1 to 5

SD = Standard deviation

The respondents believed that Quizlet is useful for their English vocabulary learning (*M*=3.81, *SD* =.64), as they believed Quizlet helped them learn English vocabulary more quickly (*M*=4.18, *SD* =.71). The results indicated that the respondents

perceived the usefulness of using Quizlet as an English vocabulary learning tool. At the same time, respondents also recognized that using Quizlet can help them improve receptive vocabulary knowledge (*M*=4.18, *SD* =.70) and productive vocabulary knowledge (*M*=4.17, *SD* = .68) very positively.

In terms of helping respondents to improve their language skills, most of the respondents did not show a very high positive attitude toward the usefulness of improving their reading skills (*M*=3.62, *SD* =.85), writing skills *M*=3.38, *SD* =.95), speaking skills (*M*=3.55, *SD* =.90), listening skills (*M*=3.60, *SD* =.86). These results indicated that the College EFL learner believed that Quizlet was a useful English vocabulary learning tool other than a tool to help them improve other language skills, but the attitude not very positive.

Themes on the perceived usefulness of Quizlet

When asked if they think Quizlet was a useful tool for them, almost all the participants agreed that Quizlet was useful in learning English vocabulary. They emphasized the usefulness of Quizlet from different aspects. It can be summarized as three sub-themes, that was, improved learning effects, improved learning efficiency, and improved language skills as shown in Table 4.12.

Table 4.12: Themes for the perceived usefulness of Quizlet

Main Theme	Subtheme
Perceived usefulness	Improve learning effects
	Improve learning efficiency
	Improve languages skills

Improved learning effects Most of the Participants stated the usefulness of Quizlet in improving their vocabulary learning effects. Student 15 expressed the following views：

> Student 15: *Well, I am not very good at memorizing words so I practice a lot on Quizlet; when I practice this word, I can see the number of times I practice it and help me remember the word. It is not like other apps by which you just are allowed to practice only once. You will not have a second chance to practice. I won't be able to remember the words clearly in that way. Well, using Quizlet, I can better remember and understand this word. I occasionally read the words out of class to review them. For example, today I learned Unit 5; I'll go back to review the words of Unit 4 on Quizlet, so I think it is quite useful for me, because I am not good at memorizing words.*

Student 15 first stressed that she was not good at memorizing vocabulary, but Quizlet allows her to practice more times as she pleases. She also can review the vocabulary she had learned before at any time to enhance her learning effects. And then, she compared Quizlet with other apps, which did not provide the chance to practice more times as learners wanted, so she could not memorize words well with the other apps. Student 23 also described that when she used another vocabulary-learning app, *Baicizhan*, she could not memorize vocabulary well at the end of her learning. However, she could learn better with Quizlet because many modules allow users to practice repeatedly.

> Student 23: *It's easier TO Learning words using Quizlet. I have used an application called "Baicizhan" before. Although I can quickly remember many words from Baicizhan, I think I didn't remember many words in the*

end. However, Quizlet has many modules that allows user to practice vocabulary, So, I remember words better than using the Baizizhan application.

This was further stated by Student 4:

Student 4：*I practice all modules because I believe that all modules have their own functions. If any module is missing, I will feel that something is missing. For example, if I didn't practice the spell module, I might think I couldn't remember the pronunciation of this word. If I don't take the test module, I don't know how many words I have mastered. Then the match modules, which are more interesting. I think each module is important, so I will learn vocabulary by all the modules.*

Student 4 emphasized that each module of Quizlet is essential for her learning vocabulary. She would be upset if she missed any of the modules; she could not be sure whether she had mastered the knowledge of every module provided for users. She mentioned that the spell module helped her learn pronunciation. The test module helped her to know what extent of vocabulary knowledge she has mastered, and the matching module provided a fun learning way which made her learning process more enjoyable.

Student 22: *And the spell module, that is the word that appears again and again, sometimes it is annoying, but most of all, it can deepen your memory, so it is very useful. That is, for example, if you learn a word, you have memorized it, you have an impression of it, but you may sometimes*

have a deviation in memorizing it. However, if it appears repeatedly, you will remember it deeply.

Student 22 especially explained the spell module and how to help her memorize vocabulary more deeply. She stressed the words that repeatedly appeared in the spell module could help her learn the words exactly, as users may not remember words correctly at once, but if they have to repeatedly spell words, they will remember them.

Quizlet with different modules allows users to practice more, giving them a deepened impression of the words, they learned. The vocabulary learning effects also was enhanced by repeated practice through different modules of Quizlet, and the above analysis indicated that College EFL learners could perceive the effectiveness of Quizlet as their vocabulary learning tool.

Improved learning efficiency When asked whether using Quizlet could improve their vocabulary learning efficiency, almost all the participants gave a positive answer. They stressed that using Quizlet, their vocabulary learning efficiency was improved. For example, Student 7 stated the following:

Student 7: *Yes, it is a handy learning tool. the traditional way of learning before is to read and spell repeatedly, which is relatively time-consuming. I write the words many times I may not realize the words are wrong. But Quizlet has a Write module, which is when I finish writing, if you have a mistake, it will remind me, and I can correct my mistake in time.*

Student 7 stressed that the traditional vocabulary learning method was time-consuming, in which users memorized words by writing them with a pen. However, if their

spelling has errors, they may not know which alphabet was miswritten in time and repeated the wrong spelling many times, so they may have wasted much time repeating the wrong spelling. However, Quizlet can help learners identify the wrong spelling in time to improve vocabulary learning efficiency. Student 7 explained that with the writing module of Quizlet, they could know the mistakes in time as the Quizlet will tell them where their spelling is miswritten once they finish their spelling. So, Quizlet helps learners avoid wasting time on repeating incorrect spelling effectively. This was further stated by Student 18:

> Student 18: *Well, for me, the spell module works best. Because it provides the pronunciation of words, according to the pronunciation, I write what the word is. If their spelling is wrong, it will tell me where spelling is wrong and which part the users write more letters or write less; they can correct the mistakes in time to improve their learning efficiency.*

Student 18 expressed that the spell module works best for her, as in the module, users must follow the pronunciation to spell words. If the user makes a spelling error, their incorrect part will be displayed on Quizlet, or will they write more or fewer letters than the target word. This module can give users answers instantly. So, the learning efficiency will be improved by knowing users' wrong spelling in time.

> Student 24: *Well, the advantage of Quizlet is that it makes you more efficient in memorizing words. It's easier for you to memorize the word with Quizlet, and it's fun. In the past, it will take a long time to memorize one word. With Quizlet, it takes a short time, for example there are ten words, and it only takes me a few minutes, five minutes, or six minutes, to memorize the ten simple words.*

Student 24 also emphasized the advantage of Quizlet in improving vocabulary learning efficiency. He gave an example, in the past, it took a long time to remember a word, but with Quizlet, he could remember these ten words in five or six minutes. For him, the time to master this word has shortened.

> Student 16: *My vocabulary is improved because Quizlet has pictures and things like that. I think it makes me memorize quickly. Because I'm not very good at memorizing words, and then, you know, look at the pictures, and sometimes the word be memorized.*

Student 16 further stressed that she needs to improve her word memory ability, but some Quizlet features can help her memorize words quickly. For example, the words she learned with pictures and pictures would help her improve her vocabulary learning efficiency.

Improved language skills When asked whether their language skills have improved after using Quizlet this semester, almost all the participants agreed their reading skills improved most, and listening and speaking skills also improved as there is a feature providing the sound of words. Student 23, for example, stated the following:

> Student 23: *My reading ability has improved. In the past, some words seemed familiar to me, but I didn't know their meanings. However, now you remember them exactly with Quizlet, I can remember them. When doing a reading exercise, some unknown new words, I know what it means now, do reading more quickly than before and understand the content what I read well.*

Student 23 identified that her reading skill has been improved according to the speed she read a passage and the extent she understood the passage's content. With the help of Quizlet, she mastered the new words that she felt familiar with but could not remember the meaning precisely in the past. So, when she reads the passage, she can read it quickly and understand the content well. Student 8 further stated that with Quizlet, her reading skill has been improved as Quizlet can provide diverse modules to help users repeatedly practice new words until they have mastered them.

> Student 8: *After using Quizlet, my reading skill has been improved. There may be some new words, and then I practice them several times with Quizlet; I will be more familiar with them. When I read passages, understanding them will be more convenient.*

With the help of Quizlet, not only leaners' reading skills be improved, but listening and writing skill also could be improved. As stated by Student 12 following:

> Student 12: *Yes, my listening skills will also be improved because Quizlet has pronunciation practice; the CET-4 listening practice is the official pronunciation, and then the pronunciation on Quizlet is also the official pronunciation; they are similar, so it is easier to understand.*

There are word sounds with the words on Quizlet; when participants learn vocabulary via Quizlet, they could listen to the official pronunciation, just like the listening contents in CET-4. Therefore, this will help learners better understand the listening content, thereby improving their listening skills, as Student 12 stated.

Student 22: *Well, I do not think my speaking has improved much, but I think the vocabulary will increase, and then it will improve my reading comprehension and writing skill.*

For the other language skills, the participant showed Quizlet would help them improve their writing skills but only slightly in improving their speaking skills. Student 22 emphasized that her writing skills would improve, but her speaking skills have not significantly improved.

4.3.3.3 Perceptions on the perceived ease of use Quizlet

This part addresses the questions: What are the college EFL learners' perceptions of the perceived ease of Quizlet?

Table 4.13: Mean of the perceived ease of using Quizlet

Items	Mean	SD	Interpretation
1. The Quizlet website and/or mobile app was clear and understandable.	3.97	.798	Positive
2. For me, it is easy to learn English vocabulary through Quizlet.	3.81	.802	Positive
3. For me, it is easy to learn English receptive vocabulary knowledge through Quizlet.	3.94	.816	Positive
4. For me, it is easy to learn English productive vocabulary knowledge through Quizlet.	3.88	.769	Positive
5. For me, it is easy to use Quizlet.	3.97	.837	Positive
Perceived ease of using Quizlet	3.92	.664	Positive

Notes: Mean range from 1 to 5

SD = Standard deviation

In Table 4.13, the average means of perceived ease of using Quizlet was 3.92 (*SD* = 0.664) above the 3.01 but below 4.00; this indicated that the respondents positively perceived ease of using Quizlet. In other words, most College EFL learners believed it was easy to use Quizlet (*M*=3.97, *SD* =.837). They believe it was easy to learn English with receptive and productive vocabulary knowledge (*M*=3.94, *M*=3.88), as the Quizlet website or mobile app was clear and understandable (*M*=3.97, *SD* =.798).

Themes on the perceived ease of using Quizlet

Almost all the respondents stated that the Quizlet was easy to use and easier to become skilful in using it. The focus of this theme was to discuss how easy it is on the use of Quizlet was perceived. Three main sub-themes emerged from the data: user friendly, easy to become skilful in Quizlet, and easy to learn EFL vocabulary as shown in Table 4.14.

Table 4.14: Themes for the perceived ease of using Quizlet

Main Theme	Subtheme
Perceived ease of use	User friendly
	Easy to become skilful in using Quizlet
	Easy learning vocabulary

User friendly When asked to comment on whether it is easy or not to use Quizlet, almost all the participants described the interface of Quizlet as clear and understandable; they felt it was easy to use it in learning English vocabulary. For example, in the extract below, student 22 shows her feelings about Quizlet.

Student 22: I quickly became familiar with all the functions displayed on the interface. There are no mess things. Watching the interface of Quizlet, you can know what you want to do next. It is pretty good.

The extract of student 22 indicates that Quizlet was quick to become familiar, and the interface was clear. No more other complicated items disturbed the user's study. This point also appeared in student 4, who also stressed that there are no other special complex operations, and she felt it very easy to understand how to use it step by step.

Student 4: Well, I think it is easier for me to use. The first time our teacher instructed us how to use it, I learned how to operate it. The operation is relatively easy for me because each module is marked very clearly. Then there are no other special complex operations and it's easy to use it to learn vocabulary.

Similarly, Student 12 also expressed that the interface of Quizlet is easy for her to open, and she could practice more on Quizlet. Whenever she opened the Quizlet, she knew how to operate it step by step, and she stated she was familiar with the interface to practice. The perceptions of Student 12 also indicated that the interface of Quizlet is clear and understandable for College EFL learners to use.

Student 12: *Well, personally speaking, I think it is relatively easy to open the Quizlet interface. Um, because I am familiar with that interface, and I have practiced a lot, and then I am familiar with that interface. When I open the interface, I know how to use each module. Most of the time, we start with the matching game, then flashcards, and step-by-step in-depth. Generally, I follow this procedure.*

Easy to become skilful in using Quizlet. When asked if it is easy to operate, the participants revealed that they felt it was easy to get started and become skilful in using Quizlet. Student 14 and Student 7, for example, stated the following:

> Student 14: *Well, it is quite easy to use that is, and we are skilful in playing mobile phones usually, so it is easy to be skilled in using Quizlet.*
>
> Student 7: *I think Quizlet is relatively easy to use, it may be a little difficult for me at the beginning, but after using it for a long time, I feel it is very easy to learn English with it.*
>
> Student 10: *I think this Quizlet is relatively easy to use; if you type the words carefully and make no mistakes, it will be quick to finish and easy to get started.*

Student 14 expressed that the Quizlet was easy for her to use; it was easier to operate the Quizlet. She also stated that they were skilful in using phones. Usually, Quizlet can be used on the phone, so it is also easy for them to be skilful in using Quizlet. Furthermore, student 7 revealed that although it was challenging to use Quizlet at the beginning, and after using it for a period of time, she also felt very pleased with it to study English. Moreover, student 10 also stressed that if the user type carefully, it can be easy to use and start the Quizlet. Student 14, Student 7, and Student 10 statements indicated that College EFL learners quickly became skilful in using Quizlet.

> *Student 3: Well, in the beginning, I was not clear on how to use it, but after the teacher instructed us how to operate it, I was skilled in using this software. It is relatively effortless to be skilful, and the word sets*

were associated with the learning content of each class, and with pictures, it was easy to remember words.

Similarly, Student 3 stated that she could learn how to operate quickly after the teacher instructed them, and she was skilled in using the software. The word sets on Quizlet made it easy to study vocabulary simultaneously. The statement of Student 15 and Student 16 indicated that no matter the Quizlet website or an app, College EFL learners could be skilled in using it. Their opinions were as follows:

Student 15: *I can get started operation quickly because I used the APP of Quizlet, after the teacher issued what word set to learn, I can open it to study at once. I think it is very convenient, on other apps, I don't know the word order, but for Quizlet, I can go through each module, and I can understand what I was doing exactly.*

Student 16: *For me, the Quizlet works quite well. I used the link that the teacher sent to us, clicked on it, and I added it to my favourites in my browser. When I need to practice vocabulary, I just clicked on it because I could not install the app on my phone.*

Student 15 stated that she could soon start operation using the convenient app. While Student 16 described that the Quizlet works quite well for her, she used the link her teacher sent them. She just clicked on it and added it to her favourite link. When she wants to study vocabulary, she clicks on the link to open the Quizlet website. It is evident that both the Quizlet website and app are convenient for College EFL learners to be skilled in using it.

Easy learning vocabulary. Most participants denoted that when they used Quizlet, they felt it was easy to learn English vocabulary. Student 9, for example, stated the following:

> Student 9: *Well, it is easier to learn words with Quizlet. I think there are some pictures on Quizlet, which will make it more convenient to associate words with them. Generally, if you study the words offline by yourself, study them directly without any other tools, that is, only read the English words and their Chinese meaning. Learning words on Quizlet are more vivid with pictures.*

Student 9 stressed that it was easier to learn words with Quizlet, as there were pictures associated with every word, so remembering the words may be more vivid. She further stated the importance of the pictures in vocabulary learning，and stated that when studying words without Quizlet, she only repeated reading the English words and their Chinese meanings to master the words.

> Student 21: *Yeah, I think it's better to study vocabulary with Quizlet. The picture is just the thing that can just stimulate a lot of different sense organs to be involved in the memory of the words. It is better than only appearing in Chinese and English at the same time, and it is easier to remember these words.*

> Student 23: *It is just simple and easy to use. Furthermore, there are pictures, sounds, and words, and you use the diverse module step by step to increase the difficulty. At first, you just follow Quizlet to read words,*

and then you memorize words and spell them out then step by step, and I think that's good.

Student 14: *What is more, Quizlet also has pictures, which can help to increase my visual stimulation and make me remember the word or the picture more deeply.*

Similarly, Student 21 and Student 14 also emphasized the importance of pictures in helping them learn English vocabulary. Student 21 and Student 23 described that the pictures on Quizlet can stimulate many different sense organs to be involved in the memory of words with pictures and sounds. Student 14 expressed that the pictures associated with the words can help her increase visual stimulation to make her remember words more deeply. The pictures helped the participants remember words easily, but the various Quizlet module can also make learning vocabulary easy. As student 16 described, there are many modules on Quizlet, and it is better than learning words, just reading, and writing in the classroom.

Student 16: *There are many Quizlet modules, which are better than just reading and writing words in the classroom. Since it has many modules, with rich content and pictures; it makes me feel that sometimes memory with pictures is also a better way.*

Student 13 further explained how the various Quizlet module could help the participant learn English vocabulary more quickly. He described the function of each module for him to learn vocabulary. Finally, he stressed that every Quizlet module could help him enhance the memory effect and let him learn more quickly.

Student 13: *The Flashcard can let me get familiar with the words firstly and better memory words. Spelling can enhance my memory of words. The Match module is an exercise to associate English words with Chinese meanings, that is, English and Chinese matching. Using the Test module will finally get a good result. Every module of Quizlet can help me to enhance my memory of words and let me memorize words more quickly; this way of learning vocabulary on Quizlet was much more convenient.*

As mentioned above, the Quizlet for College EFL learners is a useful tool that can help them learn English vocabulary more easily with diverse modules, pictures, and sounds features also as an effective stimulus to enhance the effect of learning vocabulary.

4.3.3.4 Attitudes towards the use of Quizlet

This part addresses the questions: What are the college EFL learners' attitudes toward using Quizlet?

Table 4.15: Mean of the attitude

Items	Mean	SD	Interpretation
1. I have a generally favourable attitude towards using Quizlet learning English vocabulary.	4.19	0.80	Very positive
2. I would like to use Quizlet learning English receptive vocabulary knowledge.	4.04	0.78	Very positive
3. I would like to use Quizlet learning English productive vocabulary knowledge.	4.04	0.82	Very positive
4. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining.	4.14	0.77	Very positive

Table 4.15 Continued

5. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	4.23	0.74	Very positive
6. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective.	4.08	0.83	Very positive
7. Advantages of using Quizlet overweighs the disadvantages of using it.	3.98	0.80	Positive
Attitude towards the use of Quizlet	4.10	0.67	Very positive

Notes: Mean range from 1 to 5.

SD = Standard deviation

As shown in Table 4.15, the average mean for attitude towards using Quizlet showed that the College EFL learners were very positive, with an average of 4.10 (*SD*=0.67), which is higher than 4.01 indicating college EFL learners had a very positive attitude towards using Quizlet generally. When it comes to the individual items, the respondents have a generally favourable attitude towards using Quizlet to learn English vocabulary (*M*= 4.19, *SD* = 0.80).

Regarding comparing with traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse (*M*=4.23, *SD*=.74), more entertaining (*M*=4.14, *SD* =.77), more effective (*M*=4.08, *SD*=.83). These results indicated that the College EFL learner more favourable with the Quizlet vocabulary learning and had a very positive attitude on using Quizlet.

Themes on attitudes towards using Quizlet

Participants discussed their attitudes towards using Quizlet, two main sub-themes emerged from the data, that is, positive and negative attitudes as shown in Table 4.16.

Table 4.16: Themes for attitude towards use

Main Theme	Subtheme	
Attitude towards use	Positive attitude	Convenient
		Knowing mastery of vocabulary
		Providing enjoyable learning
		Promoting learner autonomy
	Negative attitude	Too much repetition
		Advertising interference
		Network issues
		Insufficient features

Compared to traditional vocabulary learning methods or other vocabulary learning applications, most participants prefer to use Quizlet as their English vocabulary learning tool. However, some participants also hope to combine traditional vocabulary with Quizlet to achieve more effective learning outcomes. Student 2 demonstrated how she hopes to combine these two ways of vocabulary learning.

> Student 2: *In my opinion, the method combines Quizlet with traditional methods so that to make the entire course easier and increase students' acceptance. we practice the new words on paper first and then use the Quizlet to test the learning effects. This way, I feel a little bit better. Because writing on paper will give us a very good feeling, very true feeling, that is, to write it down carefully, learn the words by heart, and then to test on Quizlet. I think the Quizlet should be used based on finishing practice by traditional vocabulary learning way. I think this*

way would be more helpful because there was a time before I only practiced on Quizlet without using paper and pen to practice. But I cannot remember that word anymore when I meet it again after about two weeks. I think I should focus on the Quizlet and look at the last time's words list. As a result, some of them I have forgotten, and I felt like they had never been learned before. So, I think it should be learned traditionally, writing many times on paper, then using Quizlet as an auxiliary tool in learning vocabulary would be more effective for our vocabulary learning.

Student 2 emphasized that combining traditional vocabulary learning methods with Quizlet will be better for learners to acceptant, and the whole class will be relaxed. She also used her own experience to explain why combining the two ways would be better. China College EFL learners have been using traditional vocabulary learning methods for a long time; only they write down the word on paper; they maybe feel they have learned the words, and writing down the words on paper makes them feel satisfactory and true. Therefore, traditional vocabulary learning way also essential for EFL learners. However, Quizlet, a new technology used in vocabulary learning, has advantages and disadvantages. Next, two main sub-themes and a more detailed analysis of the participant's attitudes will be presented.

Positive attitude towards the use of Quizlet

Participants expressed their favouritism of Quizlet from the following sub-themes: convenient, knowing vocabulary mastery, providing enjoyable learning, and promoting learner autonomy.

Convenient Across the data, participants noted the convenience of using Quizlet as a vocabulary-learning tool. Almost all the participants perceived Quizlet as a convenient tool from different aspects of the Quizlet. Student 4, for example, stated the following:

> Student 4: *Well, I think I prefer using Quizlet because it's probably more convenient and more fun than the traditional vocabulary learning way. Moreover, when compared with other vocabulary learning apps I used before, the most important thing is that it is free. Users can learn a lot of things from many aspects of it.*

It is evident in Student 4's extract that Quizlet was convenient for vocabulary learning. She compared Quizlet with traditional vocabulary learning way first and stressed that Quizlet was more convenient and more fun than traditional vocabulary learning way. And then she also compared Quizlet with other vocabulary learning apps she had used before and described Quizlet as a convenient tool since Quizlet does not need to pay the VIP charge. Users also can learn a lot of vocabulary from many aspects of it. Student 17 emphasized the convenience of Quizlet from the other aspects, the expression as follows:

> Student 17: *I like Quizlet more and prefer to use it. Quizlet is relatively better; er, it is more convenient and allows users to create their own set of word lists. Then, put the unknown words together; the design of the app is good, I think.*

Student 17 described that she preferred to use Quizlet, as it was convenient; it can allow users to create their vocabulary sets to study unknown words more purposefully. Moreover, she was delighted with the feature of creating the user's vocabulary set on

Quizlet. Student 8 emphasized that the Quizlet can be used on mobile phones and was a convenient point for users.

> Student 8: *I like using Quizlet to learn English vocabulary because it is very convenient. I always take my mobile phone with me so that I can practice words in fragmented time. Compared with the traditional way of vocabulary learning, I prefer Quizlet because I think I usually use my mobile phone.*

Student 8 stressed that she liked studying English vocabulary on Quizlet because it was convenient, as she always took her mobile phone. She could learn and practice vocabulary in fragmented time. A mobile phone is a common tool in daily life. College EFL learners have mobile phones, and college life is busy for everyone, so making good use of the fragmented time daily would be a better way to learn their vocabulary. Student 3 further stressed the convenience of Quizlet as follows:

> Student 3: *Well, I prefer Quizlet. It is convenient; vocabulary learning by it would not need paper and pen. And then I can also read these words on my mobile phone. I can remember these words without having to memorize them by rote. Vocabulary learning is no longer boring.*

Student 3 expressed her favourable of Quizlet as convenient, with no need to carry a pen and paper, and she also can learn vocabulary on her mobile phone. Furthermore, learning vocabulary on Quizlet was exciting, and she did not have to learn by rote, as Quizlet was an interesting vocabulary-learning tool for her.

> Student 15: *I think Quizlet is good compared to the traditional method. I may forget the pronunciation of the words after the teacher reads them once in class. And when I review them after class, I may not remember how to pronounce the words. However, Quizlet is easier to carry. After class, I can review words I have learned, or when doing something, I can review the words on Quizlet. I can go back to the Quizlet to review the words learned in class and listen, read, speak, and write these words.*

Similarly, Student 15 also emphasized the convenience of Quizlet compared with the traditional vocabulary learning way. She described the learning vocabulary in class as more rigid and not flexible. If learners cannot follow the teacher, it will be hard for them to study after class. However, Quizlet is installed on the mobile phone, and learners can carry it anywhere. Therefore, when learners want to review the words learned in class, they can go back to Quizlet and listen to the words or practice on them; that is very convenient. Student 22 described how Quizlet was a convenient vocabulary learning tool for her in more detail as follows:

> Student 22: *I am always in my free time, that is, when I have nothing to do, for example, when I get up in the morning, I brush my teeth, have a meal, or after class, I will open Quizlet. Well, when you want to memorize a word, you can open it without carrying a thick vocabulary book. After setting the language, input English words, and the corresponding Chinese meaning will come out; very convenient; no need to look up the dictionary. It is just like that, I sometimes think about something, just like I want to input the spelling "con", to input that word,*

and then I see that word, click on it, and then it comes up with that meaning, and that is easy, without reading a book.

Student 22 first described the convenience of Quizlet as she can learn vocabulary on Quizlet at any time, such as when brushing her teeth or when have nothing to do. That is, she can use her fragmented time to learn vocabulary. Moreover, the mobile phone is smart and light; she does not need to carry a thick book when learning vocabulary, which is also very convenient for her. Most importantly, she described that when learners input English words on Quizlet, there are out Chinese meanings automatically, so they no longer need to refer to the dictionary. Participants felt the convenience of Quizlet from their own learning experience; the analysis indicated that compared to traditional vocabulary learning ways or other apps, College EFL learners experienced the convenience of Quizlet as an English vocabulary learning tool.

Knowing vocabulary mastery When asked which module they liked, most participants agreed that they liked the Test module because it provided the vocabulary learning results, which they most expected to know. Student 5, for example, stated the following:

Student 5: *My favourite is the test module, using the test module to see which one is already mastered and which one is not yet mastered. I am looking forward to my test results. I want to know how many words I know and do not know.*

Student 5 emphasized that her favourite module is the test module, which will provide her with vocabulary learning results and let her know how many words she has mastered. She also stressed that she took the vocabulary learning results very seriously.

Participants are concerned about the test results because they want to know how many words, they have mastered to learn vocabulary more purposefully.

This was further stated by Student 22:

> Student 22: *My favourite is the test module. In other words, if I have learned vocabulary through all the modules, I don't think I will go back to practice write or study modules. Because if I forget, I will use flashcards to review the words again, but I usually still use test modules. Because it can test vocabulary mastery directly, using this can help me know the extent of my mastery directly.*

Student 22 emphasized that she mostly likes the test module. She will not use these modules again if she finishes vocabulary practice through writing or flashcards. If she forgot the vocabulary and needed to review it, she only used flashcards to reinforce her vocabulary learning. However, she would like to use the test module to check how much she has mastered. Student 8 described always selecting the modules according to her vocabulary mastery. After class, she mainly uses Quizlet to test her vocabulary.

> Student 8: *When I use Quizlet after class, I choose to use some modules according to my mastery. The Study module, write module, and Test module be mostly use*d. *In class, the flashcard was not used much because the words were basically written in the textbook, and before using Quizlet, I look at the words in the textbook. After class, I mainly use Quizlet to test my vocabulary.*

Similarly, Student 7 said she also practices vocabulary on Quizlet according to her vocabulary mastery. She further explained that the flashcard and study module had been practiced many times in class, so she would like to learn vocabulary through the test module and writing module after class.

> Student 7: *After class, I will practice vocabulary according to my vocabulary mastery. Because I learned from flashcards at the beginning, and the Study module was virtually used in class. After class, I prefer the Test and Write module.*

The Test module of Quizlet provides users with the function to check how much they have mastered the vocabulary they learned. The function is acceptable among China College EFL learners because there are few more tests to check their vocabulary results. College EFL learners are eager to test their vocabulary learning results in time, so Quizlet has become a useful vocabulary learning tool for participants.

Providing enjoyable learning Participants agreed that learning vocabulary through Quizlet can enjoy vocabulary learning. According to the data, enjoyable vocabulary learning can be identified from the following three aspects: a relaxed classroom atmosphere, the development of students' interest in learning, the establishment of enjoyment, and the reduction of learning stress. Student 2 described the use of Quizlet in class and made her feel the vivid classroom atmosphere as follows:

> Student 2: *Learning on a mobile phone is more interesting than directly listening to the teacher's instructions. In addition, it can relieve students' fatigue. For example, the teacher asked students to take out their mobile*

phones to learn vocabulary on Quizlet, when students get tired in class, it will let them feel better for a while and more willing to study.

Student 2 emphasized that using Quizlet in class can relieve her fatigue after listening to the teacher's explanation for a long time because they all feel tired. When the teacher asked them to take out their mobile phones to learn vocabulary on Quizlet, they felt relaxed and more willing to study.

This was further stated by student 24:

Student 24: *I feel less pressure to learn vocabulary with Quizlet. More importantly, the classroom atmosphere becomes better. In the past, students would be sleepy after listening to the teacher's explanation for a long time. However, the teacher explained the vocabulary and then asked the students to practice this vocabulary with Quizlet. I think students have become more energetic in class.*

Student 24 expressed that using Quizlet makes him feel less pressure to learn vocabulary. He added that the classroom atmosphere becoming better after using Quizlet was most important. He took an example to explain further that the student became more energetic in class when the teacher asked them to take out a mobile phone to practice vocabulary on Quizlet after a long lecture listening period. Participants explained that Quizlet provided them with a vivid classroom atmosphere and cultivated their interest in vocabulary learning. Student 5 compared the learning vocabulary experience of this semester in college with the experience of middle school and high school as follows:

> Student 5: *In my opinion, I am more interested in learning vocabulary using Quizlet now than I used to be in middle school and high school before. Quizlet itself is very novel. There was no such a chance that allowed us to study online before. For me, taking a test online in class was a novelty. Therefore, I am very interested in it.*

Student 5 recounted her learning experience in middle and high school when she did not know the learning applications, so she was very curious about Quizlet. She emphasized that the test module of Quizlet can be used in class was a novelty for her. Therefore, she was interested in it. Student 3 stressed that Quizlet could provide them with easy delectation as below:

> Student 3: *I think I have memorized much vocabulary. The traditional way of learning vocabulary was rigid, that is, learning by rote. There are pictures on Quizlet. It can guide me in pronouncing words, and Match modules like games can make your learning relaxed and fun.*

Student 3 described her vocabulary learning experience as rigid and learning by rote before. Nevertheless, she felt relaxed and had fun after using Quizlet as a vocabulary-learning tool. The analysis indicated that Quizlet could provide users with a relaxed and enjoyable experience when learning vocabulary. Student 2 further stated that Quizlet made her feel good as below:

> Student 2: *It is easy to get started, especially on mobile phones. I feel pleased to learn vocabulary on Quizlet with my mobile phone, and I am in an excellent mood after every test.*

The student explained that Quizlet is easy to start, especially on a mobile phone, and she was happy to learn vocabulary with Quizlet. In particular, she was in a good mood after using the test module every time.

This was further stated by student 12:

> Student 12: *Yes, that is, in the Match module, I will feel delighted every time, uh, if I match well and get a top ranking, I will feel delighted. For the Study module, in the study progress, I will be pleased if I write the words correct every time and everything is clear in the learning process on Quizlet.*

Student 12 emphasized that the Match module made her very happy when she matched well and was in the top ranking. Additionally, the Study module made her feel happy when she answered the questions smoothly and made no mistakes midway through the study module. Student 2 also stressed that the use of Quizlet helped her reduce learning stress as follows:

> Student 2: *I like Quizlet very much, because it can make my English progress faster. Using Quizlet, I think vocabulary learning is efficient. The Match module of Quizlet is also enjoyable. I learned part of the vocabulary in each class, so now the pressure of vocabulary learning is much less than when I did not use Quizlet.*

Student 2 emphasized that the vocabulary learning stress was less than when she did not used Quizlet as a vocabulary learning tool. She further stated that she likes Quizlet very much because it can make her English progress faster and more efficiently than before.

In addition, she can learn part of the vocabulary in each class so that she only learns a little vocabulary simultaneously. Student 18 also emphasized that learning vocabulary with the help of Quizlet was less stressful, as she can associate vocabulary with pictures to help her memorize vocabulary and play games when she feels tired or bored. Therefore, using Quizlet makes participants' vocabulary learning more enjoyable and exciting.

> Student 18: *Quizlet would be better because it can help me learn vocabulary. I can associate pictures with the word using Quizlet and play games on it. I only learn vocabulary by repeating reading and spelling, and it is difficult to remember vocabulary, which makes me feel stressed and unhappy using traditional learning method.*

Promoting learner autonomy Almost all the participants agreed that using Quizlet could generate learner autonomy from various aspects. Student 14 stated that she enjoyed using Quizlet. Moreover, she would like the teacher releasing many words set simultaneously because she enjoyed learning vocabulary on Quizlet. Student 14 stated the following:

> Student 14: *Um, I personally like Quizlet very much. I like that the teacher releases many words sets on Quizlet, that is, several parts of the vocabulary of our textbook which can help me memorize more firmly. I think this is a kind of enjoyment, when I practice English vocabulary with no mistakes. Sometimes I will type the wrong letters, and then I will set a goal for myself. For example, when I practice next time, I must not make mistakes, be careful when I type, and then memorize the association between each picture and the word.*

Student 14 described that she would set a small goal for herself when she practiced vocabulary spelling. For example, she will not make mistakes next time or make less mistakes. The small goal indicates that she wants to learn vocabulary by herself without the supervision from others. That is, she can learn vocabulary more automatically. Because she could know the results of her vocabulary learning on Quizlet, she would like to do more vocabulary learning practice and encourage herself to be more careful next time to get good results. Student 23 further stated that she could actively learn vocabulary and master more vocabulary with Quizlet as follows:

> Student 23: *I prefer Quizlet. In the past, I felt that my vocabulary learning was relatively passive. With Quizlet, I felt that I could learn, remember, and master more words. Studying vocabulary with Quizlet, I can know which words I don't know. If I spell words error, Quizlet will show where the error is to me. I may not review the wrong words after dictation, because I don't know the words in the paper are wrong. However, Quizlet can let me learn many times, because it reminds me the misspell words instantly and then the vocabulary will be memorized.*

Student 23 compared the present vocabulary learning experience with the experience without Quizlet in the past. She described that vocabulary learning was relatively passive in the past, but now she could learn vocabulary more actively with Quizlet. She further stated that she could know vocabulary mastery with Quizlet as Quizlet can give her feedback instantly so she could actively use Quizlet. In addition, she expressed that she could learn vocabulary many times on Quizlet until she mastered the vocabulary. With the traditional vocabulary learning method, she would not learn more

vocabulary sometimes. For instance, When the teacher dictates to them, she may write wrong words, but she does not check which words are wrong, and she does not further correct the wrong words. However, Quizlet allowed her to practice many times and helped her memorize the vocabulary she did not learn well.

The data showed that Quizlet's Match module could also generate learner autonomy. Part of the participants stated:

> Student 14: *My favourite is the Match module. Um, generally, because it's like a small game. If it takes a long time to do it for the first time, I will do it several times.*
>
> Student 10: *I often redo the Match module in this way. That is, when I do it the first time, I am not satisfied with my ranking, and then I do it a few more times.*
>
> Student 16: *When doing the Match module practice, I will look at the ranking of the Match module. I will be pleased if my practice time is shorter than others. Because sometimes, for example, it takes me more than ten seconds to practice for the first time. Many people use it for eight or nine seconds, and then I will redo it. That is, I will do it again until one time I think it is okay, and then I will not continue to do it.*

Student 14 expressed that she liked the Match module the most and described it as a small game. She will do it a few more times if she finds it takes a long time when she does it for the first time. Although no one asked her to repeat the practice, but she would do it automatically. Student 10 further stated that she often had to redo the Match module

practice if she was not satisfied with the time she spent in practice. Student 16 explained in more detail how she would redo the Match module. When she finished practicing the Match module, she wanted to see how much time she had spent. She will feel pleased if she spends less time practicing the Match module than others. However, if the time she took were much more than others, she would often redo the Match module practice to reduce the match time until she was pleased with the results.

To rank at the top of the Match module ranking in the class, participants automatically previewed the vocabulary that had not been learned. Student 22, for example, stated:

> Student 22*: Sometimes, I will spend some time previewing vocabulary that I have not yet learned on Quizlet. This is because the time given to practice vocabulary on Quizlet in class is short. That is, I feel that if I have never seen these words before, I will find the time for practice very short for us. However, if I learn these words in advance, I will do it quickly, which is faster than usual. Because I have recited the words, I could finish very quickly.*

Student 22 explained that if she had not seen these words before, there needed to be more time to practice vocabulary on Quizlet. However, if she previewed these words, she would do it quickly in match Module practice. Therefore, she wants to preview vocabulary to rank first in the Match module ranking and make her happy. Student 14 stated that Quizlet allows users to create their own word sets and allows users to learn vocabulary infinite times. In other words, participants can freely use Quizlet to automatically learn vocabulary.

> Student 14: *Well, I think the advantage is, you can create your own vocabulary on Quizlet. I have not seen any other vocabulary-learning apps that allow you to create your own word sets. Then, you can learn vocabulary infinite times on Quizlet, and I think you can learn vocabulary again and again on Quizlet.*

Negative attitude towards the use of Quizlet

Most of the participants expressed their approval of Quizlet and the usefulness of it. However, some participants also described the disadvantages of Quizlet based on their experience of one-semester vocabulary learning with Quizlet. It showed a negative attitude towards the use of Quizlet. Participants' negative attitude towards using Quizlet mainly stems from the following sub-themes: insufficient features, network problems, advertising interference, and too much repetition. Each sub-theme will be analysed with related extracts.

Insufficient features Across the data, participants noted the shortcomings of the features in different aspects. Student 23, for example, stated the following:

> Student 23: *There are no example sentences of words on Quizlet. Therefore, we cannot associate example sentences with the word to better understand them. If there are example sentences of words, it may be more conducive to learning words. When practicing after class, there may be a call or other factors that may interfere with learning.*

Student 23 pointed out that there are no example sentences of words on Quizlet, which could not help users understand words by illustrating example sentences, because

students always learn vocabulary with example sentences when they learn English in middle and high school in China. Participants needed to adapt to vocabulary learning with example sentences. Participants also used to learn vocabulary pronunciation with phonetic symbols, so they also took care of no phonetic symbols on Quizlet. Student 13 explained that the pronunciation of words is not easy to remember if learners only listen to it without the help of phonetic symbols.

> Student 13: *There is no phonetic symbol on Quizlet. If I only listen to the pronunciation of words, I may not be able to remember them easily. If there are phonetic symbols, I will remember them more easily.*

> Student 24: *Well, I think some games should also be appropriately added. That is, after memorizing the words, if I feel tired, I can play some small games which can enrich the entertainment of vocabulary learning and deepen the memory of words at the same time.*

Participants described that it would be better to add more entertainment sections to the Quizlet. As Student 4 and 24 stated, the game modules were relatively few, and there was only one Match module on the phone version.

> Student 4: *Then the second is, I think it is the entertainment section. It is relatively few, and there is only one Match module on the phone version. I think it might be better if other games be added on Quizlet, that is, entertainment modules.*

> Student 18: *Well, it is fun, it is very interesting, but that gravity game is speedy. That is, it falls very quickly, and then, for example, a word has*

several Chinese meanings, but you must type all of them, and even the punctuation marks must be the same as you can pass. Well, it will be troublesome. It is just that it falls and lands quickly, and then the star has landed before you finish inputting words. Anyway, this game is not enjoyable to play.

More than one Match module was needed for the participants, although there is another game, namely the gravity game on the computer version, which does not provide any pleasure for the participants. It is evident that the gravity game is not an exciting game based on the extract of Student 18. She explained that the gravity game proceeded too fast, she could not follow well, and the passing requirement was stringent that all Chinese meanings of corresponding English words must be input; even the punctuation marks must be the same as previous words on Quizlet. As a result, the participants felt frustrating and did not enjoy the game. Participants think there should be more games on Quizlet to provide fun when they feel tired after a long time of vocabulary learning.

Network issues Participants described that sometimes they could not easily open Quizlet in class because too many students were using Quizlet at the same time, and the Internet would get stuck. Student 12, for example, stated:

Student 12: *Well, in class, due to all students using the internet at the same time, sometimes they get stuck. It takes a long time to open the Quizlet page. Usually, when we practice after class, we have college English classes on Mondays and Wednesdays. Well, there will be a free day to practice between the two class days. Students practice on Quizlet*

and use the Internet at different times. Well, they practice on Quizlet without getting stuck on the Internet.

Student 12 emphasized that if students practice on Quizlet at different times, the internet will not get stuck. This was further stated by student 16:

Student 16: *It is impossible to quickly open the Quizlet website in places where many people use the internet. However, if you are in a place where few people use the Internet, Internet problems will not occur. For example, everyone uses the Internet in our classroom, so the Quizlet website will get stuck. This will not happen when doing homework on Quizlet after class because we are all, um, scattered, so we do not have a network problem.*

Student 16 also stated that it would not be possible to quickly open the Quizlet website in a place where so many people use Quizlet at the same time. However, they can use Quizlet without Internet issues after class because students practice vocabulary in different periods. Most Chinese students use Android system phones, and according to China's official policy, they are not allowed to install apps from the Google store. Students who use Android system phones have no choice but to use the Quizlet website version.

Student 14: *Then, its shortcomings for me is that I have only have access Quizlet on the website because I cannot install a Quizlet application on my Android phones. Sometimes, the web page cannot be opened, which will delay my study.*

Similarly, student 14 stressed that if she could open the Quizlet website in class, it would ensure her vocabulary learning. Therefore, she hopes that the website version of Quizlet will be designed as quickly as the Quizlet app.

Advertising interference Sometimes advertisements would appear on the surface of Quizlet, and some participants showed their understanding of the advertisement on Quizlet. Student 4, for example, stated:

> Student 4: *Well, a common problem with many web pages is that sometimes advertisements would be pop-up. If you want to close it and click the cross mark, you will accidentally enter the advertising page. However, this is also acceptable because many websites, ah, also have this advertisement.*

Student 4 emphasized that the first of the disadvantages of Quizlet was advertisement pop-up sometimes. Participants may get into the advertisement page when they want to close the advertisement pop-up. However, Student 4 also stated that it is understandable as many websites have advertisements. While student 12 showed her displeasure with the free learning version that advertisement pop-up. She further explained that advertisement interferes with her learning.

> Student 12: *Uh, sometimes the advertisement pops up in the free learning version of Quizlet. Sometimes if I click on the cross mark to close it, it may return to the homepage, which can interfere with my studies.*

This was further stated by student 9:

Student 9: *I think the features are simple, but sometimes the web version may jump to the page of upgrade payment. Sometimes it needs to be closed, which may slow down our learning speed.*

Student 9 explained that sometimes the web version of Quizlet may jump to the *page of upgrade payment* that needs to be closed. Therefore, learning will be disturbed and got slow down. However, Student 17 stressed that other vocabulary learning apps such as *"Shanbei"* may not have advertisement. Participants showed a positive attitude towards using Quizlet, but at the same time, they also hoped Quizlet would become more convenient for their vocabulary learning with no interference.

Student 17: *Er, sometimes Quizlet cannot be opened, and sometimes there are some advertisements, but what about the "Shanbei" vocabulary learning app? There may be no advertisements.*

Too much repetition Participants stressed that too many spelling repetitions annoyed them. Student 18, for example, stated:

Student 18: *Another problem is that you need to practice many times for the words you do not know and twice for the words you know else. When practicing familiar words, repeating spelling can make me feel bored because I know the meaning of these words clearly, but I have to do so. In addition, when using the Write module, if you make a mistake and then do the right one before, you must write it again. I feel that sometimes I must write too much. Sometimes I just accidentally enter a word incorrectly, and then I must repeat it several times. Um, that's annoying to me. Because for the write module of Quizlet, learning 15 words on*

Quizlet is relatively relaxing for me. if there are 20 words to learn, we need to spell 60 times in the Write module. So, it is a lot for me, and then sometimes I'm reluctant to learn on Quizlet.

Student 18 described that in the Write module, each word needed to be practiced twice; this means that regardless of whether these words are known or not, all words in a vocabulary set need to be written twice. The repeated spelling sometimes bored her. She further stated that if users misspelled a word, they must repeat the word many times, so she felt that it was a heavy vocabulary learning workload for her. She gave an example to explain the heavy burden of vocabulary learning as that if there are 20 words in a vocabulary set, users would have to spell 60 times. Therefore, she expressed the hope of doing less repetition on Quizlet. Student 2 further stated her feelings about the repetition of spelling on Quizlet as follows:

Student 2: *For me personally, some words do not need to be repeated, maybe only repetition works for others. Anyway, sometimes I really think it's a waste of time. I have mastered the words clearly, so I do not have to practice them again. I want to review the words once. Because it is suitable for consolidating what I have learned, but if you put what I have known and do not know together to repeat spelling practice, it will, um, be a little resistant to me.*

Student 2 emphasized that someone needs to repeat spelling many times to learn vocabulary well, but she is good at English, so she does not need to repeat too many times. Therefore, she used "waste time" to describe her feelings and explained that she resisted

the repetition of spelling. Student 11 further stated her unwillingness to do so much repetition as follows:

> Student 11: *I think Quizlet has a drawback. If you make a mistake when spelling a word, it will make you repeat it many times later, which will make you very irritable.*

Student 11 emphasized that the repeated spelling made her very irritable. For example, if she was very familiar with a word, but made a mistake in spelling, she would have to repeat the spelling many times later. The student further stated that over-repetition made her vocabulary learning enthusiasm gradually fade as the following statement:

> Student 5: *Besides, um, if a word is misspelled, it will make you repeat it many times. I think repetition is good, but sometimes it can make me impatient, for example, there is a vocabulary set with many words, and they are complicated and long. It still asks you to repeat the spelling many times, and then maybe my enthusiasm may gradually fade.*

Student 5 explained that sometimes repetition is good, but sometimes it can make her impatient. Spelling repetition of words can sometimes become a heavy learning burden for college EFL learners. Therefore, learners should be guided to use Quizlet more efficiently and enjoyable.

4.3.3.5 Behavioural intention

This part addressed the questions: What are the college EFL learners' behavioural intentions toward using Quizlet?

Table 4.17: Mean of the behavioral intention

Items	Mean	Std. Deviation	Interpretation
1. I want to learn English vocabulary with Quizlet in the future.	3.86	.858	Positive
2. I want to learn English receptive vocabulary knowledge with Quizlet in the future.	3.97	.805	Positive
3. I want to learn English productive vocabulary knowledge with Quizlet in the future.	3.97	.805	Positive
4. I will use Quizlet often.	3.97	.831	Positive
5. I am going to positively utilize Quizlet to learn English vocabulary.	3.98	.863	Positive
6. I will add Quizlet as another medium to learn English.	4.00	.744	Positive
7. Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.	4.04	.811	Very positive
Behavioural intention	3.97	.705	Positive

Notes: Mean range from 1 to 5.

SD = Standard deviation

According to the data presented in Table 4.17, the mean scores for all seven items had an average of 3.97 (*SD* = .705). These scores were higher than the value of 3.01 but lower than 4.00. This outcome suggests that the College EFL learners exhibited a favourable attitude towards behavioural intention. They believed that Quizlet helped them study College English vocabulary, so they thought it would be good to use Quizlet even after finishing college English courses in the future (*M*=4.04, *SD* =.811). In terms of using Quizlet to learn receptive and productive English vocabulary knowledge, the respondents also showed a positive attitude as the mean was 3.97 (*SD* = .805) above 3.01 but below

4.00, that indicated the College EFL learners had a positive attitude on using Quizlet to study receptive and productive English vocabulary knowledge in the future.

Themes on behavioural intention

When asked, do they intend to learn vocabulary with the help of Quizlet, almost all participants expressed that they intended to use Quizlet in the future. However, there were still a few participants stated that their willingness to use Quizlet to learn vocabulary in the future was not strong. The themes for the behavioural intention shown in Table 4.18.

Table 4.18: Themes for behavioral intention

Main Theme	Subtheme
Behavioural intention	Intend to use Quizlet in the future
	Reluctant to use Quizlet in the future

Intend to use Quizlet in the future Participants described their intention to use Quizlet in the future; one of the reasons is that Quizlet provides users with the capability to generate personalized vocabulary sets. Student 4, for example, stated:

> Student 4: *Then, in the future, I think I will also use it, just as the teacher taught us in class, to create my own vocabulary sets. I think if I take the CET-4 test in the future or learn something else about English, I can build some my own vocabulary sets when I encounter words I do not know. Because I have tried creating a vocabulary set in class, it is very convenient. When you enter a word, it can show the Chinese meaning of that word, and then there are some corresponding pictures, which is very convenient.*

Student 4 emphasized that creating a vocabulary set on Quizlet is very convenient because when users enter a word, the corresponding Chinese meaning will appear automatically. Users can choose the meaning they want. Furthermore, corresponding pictures of words will be shown. Then users can select the pictures on their will, no need to spend extra time looking for pictures on the internet. Student 8 further stated that users could create vocabulary sets on Quizlet and the features of Quizlet much more than other vocabulary learning apps such as *Baicizhan*. However, the vocabulary learning with Quizlet is not so dull anymore, so she will use Quizlet in the future.

> Student 8: *Quizlet will be used in the future because I can create vocabulary sets it by myself, and it will still be used in the future. I have used a vocabulary-learning app before, Baicizhan, and I think Quizlet has more functions than other vocabulary learning applications. Learning words with Quizlet is not so dull.*

Student 18 also introduced the benefits of Quizlet as it can allow users to create their own vocabulary learning set, and she makes good use of Quizlet to learn the unfamiliar words. She described using traditional vocabulary learning methods such as paper-based word lists, which can look messy if she makes some marks on the paper.

> Student 18: *I will use Quizlet again in the future. I will create my own vocabulary sets of these words, filter the words I have mastered, and then focus on memorizing the words I do not know. Well, the vocabulary is printed on A4 paper for the traditional way of vocabulary learning. It will look chaotic if you check it with cross marks or other marks.*

Student 5 stressed that she would like to use Quizlet in the future because she is not a very self-disciplined student. Quizlet motivates her to continue vocabulary learning by presenting the learning records. She said that when she saw the modules of Quizlet were completed one after another, she perceived the accomplishment and felt successful with her learning. Furthermore, the visible achievements gave her more enthusiasm for vocabulary learning.

> Student 5*: I think, Quizlet can restrain me. I may not be a very self-disciplined student, but I think Quizlet can help me. I think I can see the completion of modules one by one, which will make me feel a sense of accomplishment, and then what I have accomplished will be visible at once. Well, I have made some achievements. I see I am studying. Then it will give me more enthusiasm for learning. I will continue to study with Quizlet.*

Reluctant to use Quizlet in the future Few participants show unwillingness to use Quizlet in the future, as student 3 stated:

> Student 3: *I think if I know the words, I will choose to review them in the textbook instead of Quizlet. However, if the words are unfamiliar to me, I suggest practicing them repeatedly with Quizlet to deepen my impression. One of the functions of Quizlet is that users can create a vocabulary set by themselves; that is, you can put the words you want to learn into a vocabulary set. I think this feature is excellent and can be used in the future.*

Student 3 described that she would not choose to use Quizlet to learn simple vocabulary. If unfamiliar with some words, she might use Quizlet for repeated practice to deepen her vocabulary learning effects. She further stated that the feature that Quizlet allows users to create their own vocabulary learning set was good for them; the feature of Quizlet might be used in the future. Student 2 also stated that she would not use all the features of Quizlet; she stated as follows：

> Student 2: *Well, this is because I was unwilling to use Quizlet initially. I feel it is OK after changing the computer to a mobile phone to practice on Quizlet in the later stage. But if the Quizlet vocabulary activity is arranged as an extracurricular activity, if the teacher does not force me to practice all the modules of Quizlet, and I think I may only use the test module and the flashcard module. These two modules are good for me. I do not think I will use others because I prefer to write down vocabulary with a pen to learn. In the future, if I use Quizlet, it will only be used as a testing tool to test how many words I have learned.*

Student 2 emphasized that if the teacher asks her to practice using only some Quizlet modules, she may only use the test and flashcard modules. She stressed that the two modules were her favourite. She intended to use the two modules rather than the rest of the Quizlet modules. She further explained that she prefers traditional vocabulary learning, practicing vocabulary learning with a pen and paper; the test module of Quizlet can be used to test her vocabulary mastering extent. Student 11 further explained the reasons why she did not want to use Quizlet as follows:

Student 11: *If I want to take college English test band 4, I will use other mobile applications. I do not tend to use Quizlet. For me, Quizlet is designed for instant memory and short-term memory when learning vocabulary. That is, maybe I do not remember the meaning of this word. But when I saw the picture and word in the flashcard module of Quizlet, it can help me to remember the word with the picture. If you ask me to choose the corresponding Chinese meaning, I may choose the correct one. However, I may not know the meaning of this word, but I matched the words with the picture correctly.*

Student 11 stated that she intended to use other vocabulary learning applications other than Quizlet during the preparation of CET-4 in the future. She explained that Quizlet is only beneficial for instant and short-term memory because she wanted to learn vocabulary deeply. She described learning vocabulary on Quizlet with the help of pictures. She only remembers the word associated with which picture, and she did not remember the word. Therefore, she is unwilling to use Quizlet to help her CET-4 in the future.

After experiencing eight weeks of College English course learning with the intervention of Quizlet, participants perceived the ease of use and usefulness of Quizlet. They expressed their positive attitude towards the use of Quizlet. Most of the participants also stated that they intend to use all the features of Quizlet or some of its features. However, there are also a few of the participants who described the unenjoyable feelings that they experienced. Their descriptions of Quizlet's shortcomings should be worth taking seriously to utilize it better to help College EFL learners learn English vocabulary in the future.

4.3.3.6 Summary of the Findings of College EFL Learners' Perceptions of Quizlet as a Tool for Learning English

In this section, the results obtained from both quantitative (Questionnaire) and qualitative (semi-structured interviews) data were reported separately for the five research sub-questions. The findings of quantitative data analysis were presented by descriptive statistics (mean, standard deviation), and the qualitative data analysis was analysed by themes with the evidence of semi-structured interview excerpts. The summary for each of the five sub-research questions is as follows.

Actual System Usage: Both quantitative and qualitative data demonstrate that college EFL learners utilize Quizlet on regularly, with a significant number of them utilizing it at least twice a week. They view Quizlet as a helpful tool for enhancing vocabulary, in particular, through its flashcard feature.

Perceived Usefulness: The statistical analysis indicates that learners have a positive perception of Quizlet as a tool for improving vocabulary and language skills. They hold the opinion that it promotes the process of acquiring new words and helps enhance one's abilities in reading, writing, speaking, and listening. The qualitative data corroborate this, highlighting enhanced learning efficacy and language skills.

Perceived Ease of Use: Quizlet is regarded positively by participants for being user-friendly and easily accessible. They credit its clarity easy navigation for enhancing vocabulary acquisition. Both data sets demonstrate the platform's ease in acquiring and becoming proficient in new vocabulary.

Attitudes Towards Quizlet: Overall, learners hold favorable attitudes towards Quizlet, perceiving it as more engaging and effective than traditional methods. They appreciate its variety and entertainment value, though concerns such as repetitive content and technical glitches are noted.

Behavioral Intention: The quantitative data indicates a favorable inclination towards Quizlet, with a significant number of individuals expressing a want to persist in using it even after completing their current studies. Qualitative analysis shows various degrees of future intention, with some individuals determined to use it while others show hesitation.

4.3.4 The Perceptions of High and Low-proficiency College EFL Learners on Using Quizlet as a Tool to Learn English

In this section, the findings of the perceptions of high- and low-proficiency college EFL learners on using Quizlet were presented based on the sub-research questions in terms of actual usage, usefulness, ease of use, attitudes, and behavioral intention.

4.3.4.1 Perceptions on the actual system usage of Quizlet

(1) Research Question 4a:

4a: Is there a difference between high and low-proficiency learners in their perceptions of the actual system usage of Quizlet?

To address the research question 4a, the difference between the mean scores of the high- and low-proficiency learners were compared to measure the perceptions of actual system usage of Quizlet. Results are tabulated in Table 4.19.

Table 4.19: Descriptive statistics of difference between high- and low- proficiency learners for perceptions of actual system usage of Quizlet

Items	Group	Mean	*SD*	*Mean Difference*
1. After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.	High	3.79	0.95	0.02
	Low	3.77	0.99	
2. I believe that using Quizlet can improve my English vocabulary knowledge.	High	4.38	0.61	0.28
	Low	4.10	0.75	
3. I believe that using Quizlet can improve my English language competency.	High	4.09	0.78	0.15
	Low	3.94	0.76	
4. I believe that using Quizlet can increase my English receptive vocabulary knowledge.	High	4.32	0.63	0.32
	Low	4.00	0.68	
5. I believe that using Quizlet can increase my English productive vocabulary knowledge.	High	4.28	0.65	0.24
	Low	4.04	0.71	
Actual system usage	High	4.17	.594	0.20
	Low	3.97	.611	

As seen in Table 4.19, on the whole the difference between the mean of the high- and low-proficiency learners is 0.20. The finding suggests a difference between the two groups in terms of perceptions of actual usage of Quizlet overall. The high-proficiency learners showed a higher mean score than low-level learners, which indicates that the high-proficiency learners were more positive than low-proficiency learners regarding the actual usage of Quizlet. For each item, the mean score of items (1, 2, 3, 4, 5) shows a difference between high- and low- low-proficiency learners in terms of the times using Quizlet every week, using Quizlet can improve vocabulary knowledge, using Quizlet can increase my

English receptive vocabulary knowledge, using Quizlet can increase my English productive vocabulary knowledge. The findings for each item indicated that the high-proficiency learners used Quizlet more than low-proficiency learners and agreed using Quizlet could improve their vocabulary knowledge.

(2) Hypothesis 4a

H_{04a}: There is no significant difference between high- and low-proficiency learners regarding their perceptions of the actual system usage of Quizlet.

Table 4.20: Independent *t* – test between High-level and Low-level for Actual system usage

Items	Group	Mean	*SD*	*t*	*p*
1. After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.	High	3.79	0.95	.082	.935
	Low	3.77	0.99		
2. I believe that using Quizlet can improve my English vocabulary knowledge.	High	4.38	0.61	1.985	.050
	Low	4.10	0.75		
3. I believe that using Quizlet can improve my English language competency.	High	4.09	0.78	.940	.350
	Low	3.94	0.76		
4. I believe that using Quizlet can increase my English receptive vocabulary knowledge.	High	4.32	0.63	2.365	.020*
	Low	4.00	0.68		
5. I believe that using Quizlet can increase my English productive vocabulary knowledge.	High	4.28	0.65	1.677	.097
	Low	4.04	0.71		
Actual system usage	High	4.17	.594	1.613	.110
	Low	3.97	.611		

Notes: Mean range from 1 to 5; *Significant level at $p < 0.05$

SD = Standard deviation, 95% confidence interval level of difference

To reveal whether there was any difference in the view of actual system usage of Quizlet between high-level and low-level College EFL learners, an independent sample *t-test* (2-tailed) was conducted. An independent sample t-test (2-tailed) using the average means showed no significant difference in the view of actual system usage of Quizlet between high-level and Low-level (t = 1.613, p = .110 > .05) as shown in Table 4.20. However, the average mean scores of High-level learners were 4.17 (*SD* = .594) above 4.01, which means the high-level learners had a very positive attitudes on the actual usage of Quizlet. The average mean score of low-level leaners was 3.97 (*SD* = .611) above 3.01 but below 4.00, therefore, low-level learners had positive attitude towards the actual usage of Quizlet. Although there was no significant difference between the views of high-level and low-level learners on the actual use of Quizlet, high-level learners had a more positive view than low-level learners in terms of agreement on the actual use of Quizlet.

When the mean scores for the five individual items were examined, the analysis showed no significant difference for all the items except Item 4 (see Table 4.20). This means that, overall, the two groups of College EFL learners were the same on the view that using Quizlet can improve their English language competency. For the usage, the high-level and low-level subjects both used Quizlet to learn English vocabulary at least once a week and finished assignments; both groups did not have a very strong willingness to practice more on Quizlet as the mean score of higher level (*M* =3.79, *SD* = .95) and low-level (*M*=3.77, *SD* =.99) below 4.01. Regarding improving receptive vocabulary knowledge, there was significant difference between the high-level and low-level learners, and the high-level subjects were more positive than the low-level subjects, as the means were 4.32(*SD* = .63) and 4.00 (*SD* = .68), respectively.

4.3.4.2 Perceptions on the perceived usefulness of Quizlet

(1) Research Question 4b

4b: Is there a difference between high and low-proficiency learners in their perceptions of the usefulness of Quizlet?

To address the research question 4b, the difference between the scores of high- and low-proficiency learners were compared to measure the perceptions on perceived usefulness of Quizlet. Results are as tabulated in Table 4.21.

Table 4.21: Descriptive statistics of differences between high- and low-proficiency learners regarding attitudes towards the usefulness of Quizlet

Items	Group	Mean	*SD*	*Mean Difference*
1. Quizlet helped me learn English vocabulary more quickly.	High	4.36	0.64	0.36
	Low	4.00	0.74	
2. My Receptive vocabulary knowledge was improved by using Quizlet.	High	4.28	0.74	0.20
	Low	4.08	0.65	
3. My Productive vocabulary knowledge was improved by using Quizlet.	High	4.32	0.63	0.30
	Low	4.02	0.70	
4. The use of Quizlet helped me to improve my reading skills.	High	3.66	0.92	0.08
	Low	3.58	0.79	
5. The use of Quizlet helped me to improve my writing skills.	High	3.47	0.97	0.18
	Low	3.29	0.92	
6. The use of Quizlet helped me to improve my speaking skills.	High	3.60	0.88	0.10
	Low	3.50	0.92	
7. The use of Quizlet helped me to improve my listening skills.	High	3.66	0.84	0.12
	Low	3.54	0.87	
Perceive usefulness	High	3.91	0.63	0.19
	Low	3.72	0.65	

As shown in Table 4.21, the mean scores of the items (1, 2, 3, 4, 5, 6, 7) all showed mean differences between high- and low-proficiency learners; the mean differences are 0.36, 0.20, 0.30, 0.08, 0.18, 0.10, 0.12 respectively, and the overall mean score also showed the difference between the two groups is 0.19. The findings indicate that high-proficiency learners hold a more positive attitude on perceived using Quizlet is more useful than low-proficiency ones in terms of using Quizlet could help them learn English vocabulary more quickly, improve their receptive and productive vocabulary knowledge, and help them improve their reading, speaking and listening skills.

(2) Hypothesis 4b

H_{04b}: There is no significant difference between high- and low-proficiency learners regarding their perceptions on perceived usefulness of Quizlet.

To address the hypothesis 4b, an independent sample t-test was conducted to evaluate the difference between the high- and low-proficiency leaner's means in terms of perceived usefulness of Quizlet. The statistical analysis of the results is as shown below Table 4.22.

Table 4.22: Independent t – test between High-level and Low-level for the perceived usefulness

Items	Group	Mean	*SD*	*t*	*p*
1. Quizlet helped me learn English vocabulary more quickly.	High	4.36	0.64	2.538	.013*
	Low	4.00	0.74		
2. My Receptive vocabulary knowledge was improved by using Quizlet.	High	4.28	0.74	1.353	.179
	Low	4.08	0.65		
3. My Productive vocabulary knowledge was improved by using Quizlet.	High	4.32	0.63	2.184	.031*
	Low	4.02	0.70		
4. The use of Quizlet helped me to	High	3.66	0.92	.434	.665

Table 4.22 Continued

improve my reading skills.	Low	3.58	0.79		
5. The use of Quizlet helped me to improve my writing skills.	High	3.47	0.97	.907	.367
	Low	3.29	0.92		
6. The use of Quizlet helped me to improve my speaking skills.	High	3.60	0.88	.518	.605
	Low	3.50	0.92		
7. The use of Quizlet helped me to improve my listening skills.	High	3.66	0.84	.670	.505
	Low	3.54	0.87		
Perceive usefulness	High	3.91	0.63	1.436	.154
	Low	3.72	0.65		

Notes: Mean range from 1 to 5; *Significant level at $p < 0.05$

SD = Standard deviation, 95% confidence interval level of difference

An independent sample *t*-test (2-tailed) using the overall means showed no significant difference in the perceived usefulness of Quizlet between High-level and Low-level groups (t =1.436, p = .154 > .05). The High-level respondents were slightly more positive than Low-level respondents in perceiving the usefulness of Quizlet (M=3.91 and3.72, respectively). When the mean scores for the seven individual items were examined, the analysis showed that there was no significant difference for all items except Item 1(t = 2.538, p = .013 < .05), Item 3 (t = 2.184, p = .031 < .05). These results indicated that High-level College EFL learners perceived more useful of the Quizlet in term of helping them to improve their vocabulary learning than Low-level college EFL learners, as the mean of High-level and was 3.91 and 3.72 respectively. The results also indicated that in terms of Quizlet helping them to learn productive vocabulary knowledge, the high-level learners were positive than low-level learners.

4.3.4.3 Perceptions on the perceived ease of use Quizlet

(1) Research Question 4c

4c: Is there a difference between high and low-proficiency learners in their perceptions of the ease of use of Quizlet?

To address the research question 4c, the difference between the mean scores of high- and low-proficiency learners were compared to measure the learners' perceptions on perceived ease of Quizlet. Results are tabulated in Table 4.23.

Table 4.23: Descriptive statistics of difference between high- and low-proficiency learners's perceptions on perceived ease of Quizlet

Items	Group	Mean	*SD*	*Mean Difference*
1. The Quizlet website and/or mobile app was clear and understandable.	High	4.06	.704	0.17
	Low	3.89	.881	
2. For me, it is easy to learn English vocabulary through Quizlet.	High	3.91	.802	0.21
	Low	3.70	.797	
3. For me, it is easy to learn English receptive vocabulary knowledge through Quizlet.	High	4.04	.721	0.19
	Low	3.85	.898	
4. For me, it is easy to learn English productive vocabulary knowledge through Quizlet.	High	4.02	.793	0.27
	Low	3.75	.729	
5. For me, it is easy to use Quizlet.	High	4.08	.746	0.21
	Low	3.87	.913	
Perceive ease of using Quizlet	High	4.02	.652	0.21
	Low	3.81	.668	

As shown in Table 4.23, the differences between the two groups for all items (1, 2, 3, 4, 5, 6, 7) are 0.17, 0.21, 0.19, 0.27. 0.21, respectively. The overall mean score also differs between the two groups; the mean difference is 0.21. The findings indicate that the high-proficiency level learners perceived using Quizlet easier than the low-proficiency

level learners in terms of thinking Quizlet is clear and understandable, learning English vocabulary is easy through Quizlet, and using Quizlet is easy.

(2) Hypothesis 4c

H_{04c}: There is no significant difference between high- and low-proficiency learners regarding their perceived ease of Quizlet.

To address the hypothesis 4c, an independent sample t-test was conducted to evaluate the difference between the two group mean regarding perceived ease of use Quizlet. The statistical analysis of the results is as shown in Table 4.24.

Table 4.24: Independent *t* – test between High-level and Low-level for perceived ease of use

Items	Group	Mean	*SD*	*t*	*p*
1. The Quizlet website and/or mobile app was clear and understandable.	High	4.06	.704	1.025	.308
	Low	3.89	.881		
2. For me, it is easy to learn English vocabulary through Quizlet.	High	3.91	.802	1.258	.212
	Low	3.70	.797		
3. For me, it is easy to learn English receptive vocabulary knowledge through Quizlet.	High	4.04	.721	1.125	.263
	Low	3.85	.898		
4. For me, it is easy to learn English productive vocabulary knowledge through Quizlet.	High	4.02	.793	1.735	.086
	Low	3.75	.729		
5. For me, it is easy to use Quizlet.	High	4.08	.746	1.226	.223
	Low	3.87	.913		
Perceive ease of using Quizlet	High	4.02	.652	1.542	.126
	Low	3.81	.668		

Notes: Mean range from 1 to 5; *Significant level at $p < 0.05$

SD = Standard deviation, 95% confidence interval level of difference

As shown in Table 4.24, an independent sample *t*-test (2-tailed) using the overall means showed no significant difference in perceiving the ease of using Quizlet between High-level and Low-level. Although the High-level mean (M=4.02, SD =.652) was slightly higher than the Low-level (M=3.81, SD =.668) in perceiving the ease of using Quizlet, there was no statistically significant difference between the two groups (t = 1.542, p =.126 >.05). The results indicated that both groups believed that it was easy to use Quizlet, but the high-level learners were very positive, the low-level learners were positive on perception of the ease of using Quizlet.

4.3.4.4 Attitudes towards the use of Quizlet

(1) Research Question 4d

4d: Is there a difference between high and low-proficiency learners in their attitudes toward using Quizlet?

To address the research question 4d, the mean of high- and low-proficiency learners regarding their attitudes towards using Quizlet were compared to measure the difference of two groups. Results are as tabulated in Table 4.25.

As shown in Table 4.25, the difference between the two groups of items (1, 2, 3, 4, 5, 6, 7) are 0.22, 0.17, 0.13, 0.28, 0.13, 0.09, 0.16, respectively, and the overall mean difference is 0.17. The findings indicate that high- and low-proficiency learners have different attitudes towards Quizlet. The findings further show that high-proficiency learners marked higher mean scores than low-proficiency learners, suggesting that high-proficiency learners hold more positive attitudes towards using Quizlet than low-proficiency learners.

Table 4.25: Descriptive statistics of difference between high- and low-proficiency learners regarding their attitudes towards using Quizlet

Items	Group	Mean	*SD*	*Mean Difference*
1. I have a generally favourable attitude towards using Quizlet learning English vocabulary.	High	4.30	0.72	0.22
	Low	4.08	0.87	
2. I would like to use Quizlet learning English receptive vocabulary knowledge.	High	4.13	0.71	0.17
	Low	3.96	0.85	
3. I would like to use Quizlet learning English productive vocabulary knowledge.	High	4.11	0.79	0.13
	Low	3.98	0.86	
4. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining.	High	4.28	0.71	0.28
	Low	4.00	0.80	
5. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	High	4.30	0.72	0.13
	Low	4.17	0.75	
6. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective.	High	4.13	0.77	0.09
	Low	4.04	0.90	
7. Advantages of using Quizlet overweighs the disadvantages of using it.	High	4.06	0.79	0.16
	Low	3.90	0.81	
Attitudes towards the use of Quizlet	High	4.19	0.64	0.17
	Low	4.02	0.70	

(2) Hypothesis 4d

H_{04d}: There a significant difference between high- and low-proficiency learners regarding their attitudes toward using Quizlet.

To address hypothesis 4d, an independent samples t-test was conducted to evaluate the difference between groups at an alpha level of 0.05 and tested the null hypothesis that there is no significant difference between high- and low-proficiency learners regarding

their attitudes towards using Quizlet. The statistical analysis of the results is shown below in Table 4.26.

Table 4.26: Independent *t* – test between High-level and Low-level learners' attitude

Items	Group	Mean	*SD*	*t*	*p*
1. I have a generally favourable attitude towards using Quizlet learning English vocabulary.	High	4.30	0.72	1.307	.194
	Low	4.08	0.87		
2. I would like to use Quizlet learning English receptive vocabulary knowledge.	High	4.13	0.71	1.053	.295
	Low	3.96	0.85		
3. I would like to use Quizlet learning English productive vocabulary knowledge.	High	4.11	0.79	0.751	.455
	Low	3.98	0.86		
4. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining.	High	4.28	0.71	1.779	.079
	Low	4.00	0.80		
5. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	High	4.30	0.72	0.868	.388
	Low	4.17	0.75		
6. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective.	High	4.13	0.77	0.501	.618
	Low	4.04	0.90		
7. Advantages of using Quizlet overweighs the disadvantages of using it.	High	4.06	0.79	1.025	.308
	Low	3.90	0.81		
Attitudes towards the use of Quizlet	High	4.19	0.64	1.222	.225
	Low	4.02	0.70		

Notes: Mean range from 1 to 5; *Significant level at $p < 0.05$

SD = Standard deviation, 95% confidence interval level of difference

According to the findings presented in Table 4.26, there was no statistically significant distinction observed between high-level and low-level learners in terms of their attitude towards utilizing Quizlet. The results of an independent sample t-test (2-tailed) using the overall means indicate that there is no statistically significant difference between

individuals with high-level and low-level attitudes towards the use of Quizlet (t= 1.222, p=.225>.05). The findings of this study revealed that the college EFL learners exhibited favourable attitudes towards the utilization of Quizlet as a learning tool. However, the overall average mean of High-level participants (M=4.19, SD =.64) was slightly higher than that of Low-level respondents (M=4.02, SD =.70).

When the mean scores for the seven individual items were examined, the analysis showed no statistically significant difference for all the items. This means the two groups of College EFL learners had the similar attitudes toward using Quizlet. However, the mean score of high-level learners was 4.13 (SD = 0.71), mean scores of the low-level learners was 3.96 (SD = .85) in terms of leaners would like to use Quizlet learning English receptive vocabulary knowledge. This means that high-level learners were very positive and low-level learners were positive in terms of they would like to use Quizlet learning English receptive vocabulary knowledge. Furthermore, the mean score of high-level learners was 4.11 (SD = 0.79), mean scores of the low-level learners was 3.98 (SD = .86) in terms of leaners would like to use Quizlet learning English productive vocabulary knowledge. This means that high-level learners were very positive and low-level learners were positive in terms of they would like to use Quizlet learning English productive vocabulary knowledge.

4.3.4.5 Behavioural intention

(1) Research Question 4e

4e: Is there a difference between high and low-proficiency learners in their behavioral intentions toward using Quizlet?

To address research question 4e, the difference between the mean scores of groups was compared to measure the difference in high- and low-proficiency learners' behavioral intention toward using Quizlet. Results are as tabulated in Table 4.27.

Table 4.27: Descriptive statistics of difference between high- and low- proficiency learners' behavioral intention towards using Quizlet

Items	Group	Mean	*SD*	*Mean Difference*
1. I want to learn English vocabulary with Quizlet in the future.	High	4.00	0.692	0.27
	Low	3.73	0.984	
2. I want to learn English receptive vocabulary knowledge with Quizlet in the future.	High	4.15	0.691	0.36
	Low	3.79	0.874	
3. I want to learn English productive vocabulary knowledge with Quizlet in the future.	High	4.13	0.711	0.32
	Low	3.81	0.867	
4. I will use Quizlet often.	High	4.15	0.807	0.36
	Low	3.79	0.824	
5. I am going to positively utilize Quizlet to learn English vocabulary.	High	4.15	0.780	0.34
	Low	3.81	0.915	
6. I will add Quizlet as another medium to learn English.	High	4.13	0.741	0.25
	Low	3.88	0.733	
7. Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.	High	4.21	0.778	0.33
	Low	3.88	0.815	
Behavioural intention	High	4.13	.631	0.32
	Low	3.81	.744	

As seen in Table 4.27, the mean difference between groups of items (1, 2, 3, 4, 5, 6, 7) are 0.27, 0.36, 0.32, 0.36, 0.34, 0.25, 0.33, 0.32, respectively and the overall mean difference is 0.32. The findings show a difference between high- and low-level learners regarding their behavioral intention to use Quizlet. The findings also show that the mean scores of high-proficiency learners for each item are higher than the low-proficiency learner's mean, indicating that high-proficiency learners are more willing to use Quizlet in the future than low-proficiency learners.

(2) Hypothesis 4e

H04e: There is no significant difference between high- and low-proficiency learners' behavioral intention towards using Quizlet

To address hypothesis 4e, an independent samples t-test was conducted to evaluate the difference between high- and low-proficiency learners' behavioral intention towards using Quizlet at an alpha level of 0.05 and tested the null hypothesis of no significant difference between groups regarding their behavioral intention towards using Quizlet. The statistical analysis of the results is shown in Table 4.28.

Table 4.28: Independent *t* – test between High-level and Low-level for behavioral intention

Items	Group	Mean	*SD*	*t*	*p*
1. I want to learn English vocabulary with Quizlet in the future.	High	4.00	0.692	1.555	.124
	Low	3.73	0.984		
2. I want to learn English receptive vocabulary knowledge with Quizlet in the future.	High	4.15	0.691	2.207	.030*
	Low	3.79	0.874		
3. I want to learn English productive vocabulary knowledge with Quizlet in the	High	4.13	0.711	1.936	.056
	Low	3.81	0.867		

Table 4.28 Continued

future.					
4. I will use Quizlet often.	High	4.15	0.807	2.134	.035*
	Low	3.79	0.824		
5. I am going to positively utilize Quizlet to learn English vocabulary.	High	4.15	0.780	1.928	.057
	Low	3.81	0.915		
6. I will add Quizlet as another medium to learn English.	High	4.13	0.741	1.671	.098
	Low	3.88	0.733		
7. Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.	High	4.21	0.778	2.064	.042*
	Low	3.88	0.815		
Behavioural intention	High	4.13	.631	2.245	.027*
	Low	3.81	.744		

Notes: Mean range from 1 to 5; *Significant level at $p < 0.05$

SD = Standard deviation, 95% confidence interval level of difference

As shown in Table 4.28, an independent sample t-test (2-tailed) using the overall means showed a significant difference in the part of behavioural intention between High-level and Low-level College EFL learners ($t = 2.245$, $p = .027 < 0.5$). The High-level group was more positive (M=4.13, SD =.631) than the Low-level group (M=3.81, SD =.744). When the mean scores for the seven individual items were examined, the analysis showed that Item 1 ($t = 1.555$, $p = .124 > .05$), Item 3 ($t = 1.936$, $p = .056 > .05$), Item 5 ($t = 1.928$, $p = .057 > .05$), Item 6 ($t = 1.671$, $p = .098 > .05$) showed no significant difference between two groups. However, Item 2 ($t = 2.207$, $p = .030 < .05$), Item 4 ($t = 2.134$, $p = .035 < .05$), Item 7 ($t = 2.064$, $p = .042 < .05$) was statistically significantly

different between the two groups. The results indicated that both groups were strongly willing to use Quizlet as an English vocabulary learning tool. However, the High-level group was more positive than the low-level group regarding the behavioural intention of Using Quizlet.

4.3.4.6 Summary of the Perceptions of High and Low-proficiency College EFL Learners on Using Quizlet as a Tool to Learn English

This section compares perceptions between high- and low-proficiency college EFL learners regarding Quizlet usage:

Actual System Usage: While both groups use Quizlet regularly, statistical analysis did not reveal significant differences in usage patterns between high- and low-proficiency learners.

Perceived Ease of Use: No significant differences were found in how high- and low-proficiency learners perceive Quizlet's ease of use, suggesting a consistent user experience across proficiency levels.

Perceived Usefulness: Both groups similarly value Quizlet for its utility in improving vocabulary and language skills, although high-proficiency learners showed statistically significant higher ratings on specific items related to vocabulary improvement speed and effectiveness.

Attitudes Towards Quizlet: Overall attitudes towards Quizlet did not significantly differ between high- and low-proficiency learners, indicating a generally positive reception of the platform regardless of proficiency level.

Behavioral Intention: Significant differences were observed in behavioral intention towards Quizlet, with high-proficiency learners showing a stronger inclination to continue using it in the future compared to low-proficiency learners.

4.4 Summary

The findings of the study suggest that the Experimental and Control groups exhibited similar levels of baseline performance. This was evident from the lack of significant differences in mean scores for receptive and productive vocabulary knowledge at the pretest stage. Nevertheless, the findings obtained at the posttest stage reveal a notable disparity in the performance between the Experimental group and the Control group in relation to their receptive and productive vocabulary knowledge, as illustrated in Table 4.29.

Table 4.29: Summary of the tests results

Vocabulary	Pretest	Posttest
Receptive	Experimental = Control	Experimental > Control
Productive	Experimental = Control	Experimental > Control

In terms of the college EFL learners' perceptions towards using Quizlet, the analysis of questionnaire data shown that they were positive about using Quizlet as their college English vocabulary learning tool in generally. However, the analysis for part of the constructs showed that the high-level learners were more positive than low-level learners, and the summary of the questionnaire data analysis can be seen in Table 4.30.

Table 4.30: Summary of questionnaire data analysis

Construct	Overall	High-level learners	Low-level learners
Actual usage	Very positive	Very positive	Positive
Perceived usefulness	Positive	Positive	Positive
Ease of use	Positive	Very positive	Positive
Attitude	Very positive	Very positive	Very positive
Behavioural intention	Positive	Very positive	Positive

The questionnaire data was cross validated with the thematic analysis results of the semi-structured interview data, which focused on the perceptions of college EFL learners regarding the utilization of Quizlet in their college English course learning process. The analysis shows that the participants have an overall positive attitude towards using Quizlet as an English vocabulary learning tool. Overall, participants intended to continue using Quizlet for English vocabulary learning, but there were still few students showed reluctance to continue using it in the future. The summary of the themes and subthemes shown in the Table 4.31.

Table 4.31: Summary of themes and subthemes

Main Theme	Subtheme
Actual usage	Use at least twice weekly
	Flashcard module was firstly used
	Improving vocabulary knowledge
Perceived ease of use	User friendly
	Easy to become skilful in using Quizlet
	Easy learning vocabulary

Table 4.31 Continued

Perceived usefulness	Improve learning effects Improve learning efficiency Improve language skills	
Attitude towards use	Positive attitude	Convenient Knowing mastery of vocabulary Providing enjoyable learning Promoting learner autonomy
	Negative attitude	Too much repetition Advertising interference Network issues Insufficient features
Behavioural intention	Intend to use Quizlet in the future Reluctant to use Quizlet in the future	

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Chapter Overview

This chapter discusses the findings presented in Chapter 4. It begins with a summary of the research and then discusses the findings, implications of the study, recommendations for future research, and a conclusion of the research.

5.2 Summary of the Research

The aim of the study is to examine the effects of using Quizlet in vocabulary acquisition among college EFL learners at the Weifang Institute of Technology in Shandong Province, China, and their perceptions of its use in language learning. Specifically, the study's objectives are to examine the effects of the Quizlet intervention on the performance of vocabulary knowledge in both receptive and productive dimensions among Chinese college EFL learners and investigate their perceptions of using Quizlet after the intervention. The study was designed to address four major research questions. The first question examined the difference between the Quizlet and non-Quizlet groups' receptive vocabulary knowledge performance of college EFL students. The second question examined the difference between the Quizlet and non-Quizlet groups' productive vocabulary knowledge performance of college EFL students. The third research question examined the college EFL learners' views on Quizlet as a tool for learning English. For the third research question, guided by the Arshad et al. (2012) revised TAM model, the research question was subdivided into five research questions to get more evident results on the perceptions of using Quizlet. The fourth research question investigates the high- and low-proficiency college EFL learners' perceptions of using Quizlet, as mentioned in the

third research question; the fourth research question was also subdivided into five sub-research questions.

Non-equivalent quasi-experimental research with pretest-posttest control group design has been adopted for the study. The data was collected by mixed method to cross-validate the research findings. The pretest and posttest scores of both the experimental and control groups were used to measure the performance of receptive and productive vocabulary knowledge acquisition. The Questionnaire and semi-structured interview were conducted to collect data for college EFL learners' perceptions of using Quizlet after the eight weeks intervention. Using purposive sampling, 191 Year 1 college students from a private college in Shandong province were selected to participate in the study. The 191 participants were from four intact classes, as two intact classes have college English lessons together. Therefore, the four intact classes were divided into two groups according to the college assignments. The two groups were randomly assigned to experimental and control groups, the control group with 96 college EFL students and the experimental group with 95 college EFL students. During the eight weeks, students in the experimental group learned vocabulary with Quizlet intervention, while those in the control group learned vocabulary with the traditional method (paper-based word list) for each class, which lasted about 15 to 20 minutes after the teacher explained the meaning of the words.

Primary instruments employed in the study include receptive and productive test materials for measuring the performance of both experimental and control group students' vocabulary knowledge performance, while semi-structured interview protocols and questionnaires to get college EFL learners' perceptions on using Quizlet. In the first four weeks, the students in the experimental group were instructed to familiarise learning words

using Quizlet for each class, which lasted about 20 minutes, while the students in the control group learned with paper-based word lists, which also lasted around 20 minutes. Every week, students have two times college English classes, and pretests were administered for both the experimental and control groups in the second class of week four. The posttests were conducted in the first-class time of week 13 for both the experimental and control groups. The content of the pretests and posttests were the same, but the order of the questions differed, with receptive vocabulary knowledge being tested first, followed by productive vocabulary knowledge. After students completed the test, students in the experimental group were guided to complete a questionnaire, of which 24 volunteers who completed the questionnaire participated in a semi-structured interview.

The results indicated that traditional vocabularies learning method (paper-based word list) and Quizlet are effective for college EFL learners' vocabulary knowledge performance. However, an independent t-test of the posttest mean scores of the experimental and control groups showed that the experimental group of participants scored significantly higher than the control group in terms of receptive and productive vocabulary knowledge. The results indicated that Quizlet is more effective than paper-based word lists in college EFL learners' receptive and productive vocabulary knowledge learning process. In addition, the questionnaire and semi-structured interview data analysis showed that the participants had a positive attitude towards using Quizlet as their vocabulary learning tool. Therefore, it is possible to consider integrating Quizlet into college English course learning based on the effectiveness of Quizlet on college EFL learners' vocabulary knowledge performance and college EFL learners' positive attitudes toward using Quizlet.

5.3 Receptive and Productive Vocabulary Knowledge Performance

The first major finding of this study is that college EFL learners in the experimental group performed significantly better than those in the control group in terms of receptive vocabulary knowledge performance. The second major finding of the study is that college EFL learners who experienced Quizlet-based vocabulary learning intervention significantly outperformed those in the control group who used paper-based word lists learning vocabulary learning method regarding productive vocabulary knowledge performance. In other words, the Quizlet-based vocabulary learning approach is more effective in receptive and productive vocabulary knowledge learning among Chinese college EFL learners during their college English course learning. These results proved the effectiveness of Quizlet in promoting EFL learners' vocabulary acquisition, which aligns with previous research (Montaner, 2019; Susila, 2023; Yüksel et al., 2020). In their research, the participants learning vocabulary via Quizlet gained significantly greater scores than the traditional method (e.g., paper-based card, word list). However, their research did not include a control group; the present study adds greater validity and reliability to the literature by including a control group.

There are various reasons for the significant improvements in the scores of College EFL learners who used the Quizlet intervention. The integration of both verbal and nonverbal stimuli on Quizlet may have stimulated the hippocampus in the brain, leading to enhanced long-term memory retention (Nguyen & Le, 2023b; Paivio, 2010). According to Paivio's dual-coding theory (Paivio, 1971, 1986, 1991), which claimed that verbal and non-verbal codes enhance learning and memory. Non-verbal codes represent information in the form of mental images visual or spatial representations, whereas verbal codes represent information in the form of words. Multiple retrieval pathways are created when

information is encoded simultaneously using both codes, enhancing recall and recognition. In the current study all the words presented on the Quizlet with pictures assisting the learners to remember the words. Nation (2013, 2022) asserts that the utilization of visual aids, such as pictures, is advisable. In certain instances, the most effective means of conveying the meaning of a word may be using a diagram or picture.

The utilization of audio, pictures, and sounds in Quizlet has been found to have a substantial impact on the acquisition of vocabulary (Janebi & Haghighatpasand, 2019; Nguyen & Le, 2023b). In addition, an experimental study conducted by Lee (2021) also confirmed that pictures were an effective tool in vocabulary learning as the employment of pictures makes a distinction in how a word was effectively encoded. In the present study, during the semi-structured interview, the participants also stated that the pictures on Quizlet helped them to associate word form with meaning making their vocabulary learning easily. The significantly better performance of learners in the experimental group proved that the pictures benefit learners' receptive and productive vocabulary knowledge learning. In addition, Alabedi et al. (2023) conducted an experimental study, also verified the learners learning with Quizlet performed better than those who did not in control group. They also emphasized that the reason behind the improvement in students' vocabulary achievement within Quizlet could be due to experiencing target words verbally (verbal codes) and nonverbally (images), while students within the traditional approach experienced the target words using only the verbal codes. In this sense, students in the experimental group learned the target vocabulary using flashcards which connected the two channels that helped students to better recall by decreasing the cognitive load on their working memory (Paivio, 2013).

The flashcard is an essential reason to state the college EFL learners with Quizlet performed significantly better than those using word list in control group. Although all the vocabulary learning activities in both experimental and control group belong to explicit learning according to the explicit definition (Ma & Kelly, 2006; Ellis, 1994a), as the students noticed the new words and have the deliberate goal to learn the new word. As Nation (2013, 2022) proposed one of the most effective vocabularies learning methods is explicit learning regarding the aspects of vocabulary knowledge of meaning. It was also supported by several scholars (Ellis, 1994b, Laufer, 2005; Schmitt, 2008), who emphasized that vocabulary learning with explicit methods is significantly more efficient than implicit ones. Flashcards facilitate learners in retrieving information (Mishall et al., 2023). Nevertheless, word lists typically present students with both foreign words and their corresponding native counterparts, making them less desirable compared to cards (Ceylan, 2021). Nation (2013, 2022) stated that learning from word cards helps learners learn the word's written form, the concept of the word, and the connection between the form and the meaning. This is because writing the word on one side of the card and the word's meaning on the other side allows the learner to retrieve the word's meaning from memory. And the learning of word knowledge pertaining to "form and meaning", including both productive and receptive knowledge, can be effectively facilitated by implementing the word cards strategy within the context of learning (Nation, 2013, 2022).

The significant better vocabulary knowledge performance of experimental group learners regarding receptive and productive knowledge affirmed the effectiveness of flashcard in vocabulary knowledge learning. According to Nation (2013, 2022), the quality of mental processing significantly impacts explicit learning; therefore, students should map or connect their understanding of a word's form to its meaning. The teacher ought to

explain words, especially those with high frequency, and students should do activities, look up definitions in dictionaries, and consider the meanings (Nation, 2013, 2022). In the present study, the teacher first explained the target words to the students, who then had fifteen to twenty minutes to practice them using Quizlet in the experimental group and paper-based word lists in the control group. In the process, the explicit vocabulary learning involved into the vocabulary learning with Quizlet and wordlist, however, learning with Quizlet enhanced college EFL learners' vocabulary knowledge acquisition by retrieve that providing bu the flashcards modes.

Another factor that contributes to the significantly higher improvement in receptive and productive vocabulary knowledge learning of the Quizlet-based vocabulary learning method may be the diverse vocabulary learning module on Quizlet, which allows learners to do productive and receptive vocabulary learning practice repeatedly. And Flashcards support spaced repetition by allowing to review and recall information at optimal spacing intervals until the information is learned sufficiently to recall (Mishall et al., 2023). According to Nation (2013, 2022), repetition is one of the important vocabulary learning strategies, and scholars have different views on the repetition times for words to be remembered due to the difficulty of different words. Nation (2013, 2022) suggested, generally, the more repetitions, the better it is for vocabulary learning. As mentioned in Chapter 2, Quizlet is one of the digital flashcards, and it contains several modules, such as *flashcards, study, write, spell, test, and match modules***.** The modules allowed learners to repeat the vocabulary practice in different modules and made learners not easily feel bored (Hikmah, 2019; Korlu & Mede, 2018; Lander, 2016; Setiawan & Wiedarti, 2020).

The semi-structured interview also showed that college EFL learners perceived Quizlet could enable them to learn vocabulary repeatedly through various tasks (e.g., Flashcard, Match, Write, Test). They stated that the various tasks made their learning more exciting and not easy, to feel bored and let them learn vocabulary better than the traditional method; however, if the words on Quizlet were repeated too many times, they would feel impatient. Furthermore, they also stated that the number of words in one word set should not be too many; the numbers 10 to 15 are comfortable for them. If the number of words in one set exceeds 20 words, they would not be willing to use Quizlet because if they practice every task once, they will learn words repeatedly many times. Consistent repetition and review are essential for learning high-frequency words (Mishall et al., 2023), and this can help students become more familiar with the words and improve their ability to recall them in different contexts (Nation, 2013, 2022). The repeated times should also be considered, as it is related to distributed learning, which is shown to be superior to mass learning in promoting lexical gains (Nakata & Suzuki, 2019; Nakata & Webb, 2016). The underlying point is that words should be learned or taught gradually over some time rather than trained altogether at a time (Nguyen & Van Le, 2023).

Another factor that contributes to the significantly better vocabulary knowledge performance of college EFL learners with Quizlet intervention may be due to Quizlet as one of the digital game-based vocabulary learning platforms, which makes the learning environment more engaging and enjoyable (Alabedi et al., 2023; Anggoro & Pratiwi, 2023; Rashid et al., 2019). It is believed that digital game-based vocabulary learning in the classroom and outside the classroom can successfully enhance language learning as it makes language acquisition easier and quicker for students (Bayaksud et al., 2024; Gokbulut, 2020; Waluyo & Bucol, 2021). The semi-structured interview data analysis also

showed that college EFL learners perceived learning vocabulary via Quizlet as exciting and could enhance their learning motivation and autonomy for vocabulary learning. For example, participants stated that the Match mode is like a game, allowed them to learn vocabulary interestingly, and if they finished match mode activities using more time than others, they would repeat the activities many times until they were satisfied with the rank of the match mode when compared with other learners. In addition, The Test mode could provide learners with instant feedback; it also ensured learners' enthusiasm in continued vocabulary learning with Quizlet; as the findings revealed from semi-structured interviews, they stated that they were eager to know how much they have mastered the vocabulary, and the Test mode could give them the instant feedback.

Previous studies have conducted quasi-experimental designs (Aksel, 2021; Avezova, 2022; Berliani & Katemba, 2021; Bueno-Alastuey & Nemeth, 2022; Chaikovska & Zbaravska, 2020; Cho, 2021; Dewi & Rahma, 2022; Hồng & Du, 2021; Kholis & Nadhif, 2023; Nguyen & Van Le, 2023; Nhan, 2022; Susila, 2023) or classroom action research methods (Fadhilawati et al., 2022; Senior, 2022) to investigate the effectiveness of Quizlet as a vocabulary acquisition tool for language learners. Their empirical studies used pretests and posttests to measure the performance of learners' vocabulary knowledge learning. However, only a few studies have used vocabulary measures to distinguish between receptive and output vocabulary knowledge performance. Most of the studies did not distinguish the differences between receptive and productive vocabulary knowledge, the tests used in their studies could not identify whether Quizlet is effective for receptive or productive vocabulary learning. According to the present study's findings, Quizlet is effective in receptive and productive vocabulary knowledge performance. When students use the Quizlet, generally, they look at the flashcard first, look at the word form, and recall

the word's meaning; that is receptive learning. Quizlet flashcards also allow learners to check the meaning of words first and then recall the form of the words; that is productive learning. Learning vocabulary through the Quizlet Write module is also one kind of productive learning.

The findings of this study indicate that participants in the experimental group demonstrated superior performance in both receptive and productive vocabulary knowledge compared to participants in the control group. This means that Quizlet exhibits more effectiveness compared to conventional approaches for vocabulary acquisition. The results of this study contradict Atalan's (2023) findings, which found that Turkish high school EFL learners did not perform significantly better than the control group in learning vocabulary using the Quizlet intervention. In Atalan's (2023) study, the participants were high school students who would endeavour to learn English to enter university or college. In contrast, the participants in the present study were college students who were less motivated to learn vocabulary than high school students. Therefore, although Quizlet was more effective than traditional vocabulary learning methods in this study, other factors such as learners' motivation, also affect the effectiveness of vocabulary learning.

In the present study, the receptive vocabulary knowledge posttest mean score of the Quizlet group was 27.48 (SD = 12.09), the productive vocabulary knowledge mean score was 28.43 (SD = 12.93), which indicated college EFL learners using Quizlet performed similarly better in terms of receptive and productive vocabulary knowledge. The result is contrary to Bueno-Alastuey and Nemeth (2022), who found that the Quizlet group obtained higher scores in receptive posttests than productive vocabulary knowledge posttests. The reason behind the difference in scores is the different types of tests used to

measure vocabulary knowledge scores. Different types of tests (e.g., receptive recall test, receptive recognition test, productive recall test, productive recognition test) might have yielded different results (Václavík, 2020); therefore, the test types should be taken into consideration when comparing the research results of different studies. Bueno-Alastuey and Nemeth (2022) used a receptive recognition test to measure receptive vocabulary knowledge performance and a productive recall test to measure productive vocabulary knowledge performance. According to Nation (2013), a vocabulary recall test is more difficult than a vocabulary recognition test. However, in the present study, the receptive and productive tests used vocabulary recall tests. In the present study, the same receptive and productive test type ensured the same difficulty of the tests.

Nation (2013, 2022) encouraged learners to learn receptively and then productively. Nation (2013, 2022) also underlined that learning words should ideally begin receptively (see the word - remember its meaning) and progress to productive learning (see the meaning - remember the word form). Here, there are two factors to think about: the learning's difficulty and its intended application. Quizlet allows learners to achieve more significant vocabulary knowledge performance, as Nation's (2013, 2022) suggested that learning activities using images, matching words with definitions, and drawing and labelling pictures will help learners better acquire word form and meaning. The features of Quizlet, such as *flashcard, match, study, spell, write, and test*, all contribute to improving vocabulary knowledge. Therefore, the Quizlet-based vocabulary learning approach could help college EFL learners learn college English vocabulary more effectively regarding receptive and productive vocabulary knowledge.

In summary, the Quizlet intervention during the college English course enhance the college EFL learners' vocabulary learning as following process. First, the teachers introduce and explain the target word firstly at the beginning stage of the class, which make college EFL learners to notice the word before studying the textbook content which including the target words. Second, the teachers ask students to practice words on Quizlet via *flash card, study, write, match* or *test* modules giving leaners chance to retrieval the words and get a lot of repetition. Finally, after 15 to 20 minutes of practice, the class continues with the coursebook's speaking, listening, writing, or reading components, allowing students to use the words creatively. The Quizlet intervention well adopted the Nation's (2013, 2022) three psychological conditions that encouraging vocabulary learning that is noticing a word, retrieval a word, and using the word creatively would help vocabulary learning occur.

5.4 College EFL Learners' Perceptions towards Using Quizlet

The results of the current study demonstrated that the college EFL students had positive behavioural intentions for using Quizlet in the future. The reason may be learners' perceptions of Quizlet's usefulness are positive. And learners positively perceived the ease of Quizlet. Moreover, learners' attitudes towards using Quizlet were very positive. According to Davis's (1989) TAM model and Arshad et al. (2012) revised model, *perceived ease of use* and *perceived usefulness* could predict users' acceptance and behavioural intention of technology. Therefore, after the Quizlet intervention, college EFL learners perceived the ease and usefulness of it, and had positive attitudes on the using of it, so the individuals exhibit a favourable inclination towards utilizing Quizlet as a means to enhance their vocabulary acquisition in subsequent learning endeavours.

Findings from the Questionnaire showed college EFL learners very positive (M=4.07, SD=.61) on using Quizlet during the intervention. However, when after finishing the vocabulary practice assignment on Quizlet, the mean scores declined to the range of positive (M=3.78, SD=.97). This means may be that college EFL learners could not very positive in using Quizlet without teacher's supervision. It was supported by semi-structured interview, the majority participants stated that they followed teacher's instruction using Quizlet two times in the classroom, and two times after class to finish out classroom assignments on Quizlet, but they seldom use Quizlet without the teacher's assignment. Similar results were found in Vu and Bui's (2023) study; they found that 67.74% of participants showed learning vocabulary with Quizlet in class is very excited, while 6.45% showed that vocabulary learning activities with Quizlet at home is very excited, and up 61.29% participants showed their attitude as neutral on the excitement with vocabulary learning activities with Quizlet at home. Vu and Bui (2023) argued that without strong motivation and a sense of autonomy, it was hard for students to sit down and be keen on the vocabulary exercises at home. Although learners very positive in believing that using Quizlet could improve their English vocabulary knowledge, specifically, they believe using Quizlet could increase receptive (M=4.16, SD=0.67) and productive (M=4.16, SD=0.69) vocabulary knowledge. However, they are only positive (M=3.78, SD=0.97) in using Quizlet after completing the teacher's assignment.

The above findings are consistent with previous studies (Cho, 2021; Dreyer, 2014; Vu & Bui, 2023; Wiedart, 2020; Waluyo & Bucol, 2021) which also emphasized the importance of teacher's supervision in using Quizlet to learn vocabulary. They argued that technology limitations should be noted; learners need the initiative, motivation, and disciplinary habits to explore the vocabulary sets to ensure significant improvement.

Quizlet Significant improvement may not be achieved if learners do not have the initiative, motivation, and disciplined habits to explore the vocabulary sets at home. In Chinese context, there are many social networking applications such as *Wechat, QQ* or other game applications on their smartphone maybe disturb learners' learning (Yang & Li, 2022), thus few students would not use their phones to learn new words and would instead do other things. The data collected from the semi-structured interview also showed that social media would be a distraction for their vocabulary learning with Quizlet. Some participants stated that they would check WeChat messages or play games via a game application on their mobile phones. According to previous studies (Ataboyev & Tursunovich, 2023; Juryatina & Amrin, 2021; Pishghadam et al., 2021; Sadoughi & Hejazi, 2021), the teacher plays a vital role in language learning. This includes providing motivation and guidance for the learner, assessing learning outcomes, conducting evaluations or tests, praising students, and punishing students who do not complete assignments. Therefore, creating a supervision system for the teacher is necessary to ensure college EFL learners' vocabulary learning.

College EFL learners perceived Quizlet could mainly help them learn vocabulary knowledge including receptive and productive vocabulary knowledge effectively and quickly. The findings from semi-structured interview proved the findings from the questionnaire that college EFL learners had positive opinions towards the usefulness of Quizlet in vocabulary learning process. The current study findings in aligns with previous studies (Bueno & Nemeth, 2022; Korlu & Mede, 2018; Lander, 2015; Meng, 2021), which claimed that learners hold positive attitude towards the usefulness of Quizlet in their vocabulary learning process. The reason maybe that Quizlet provides learners with productive and receptive learning modules such as *write module*, *match module* and

Quizlet gives learners instant feedback via the *test module* about their mastery of the vocabulary they have learned by Quizlet. The Test mode provides the learner with instant feedback. According to the feedback on Test mode, the learners could use the Learn, Write, Match modes to rehearse the words that they could not learn well, which may have helped them use their study time more effectively to review missed words instead of learned words, hence helping them consolidate their vocabulary (Sage et al., 2019; Yüksel et al., 2020). Therefore, with the various vocabulary learning modes, learners could perceive improved receptive and productive vocabulary knowledge. For example, they could write out the target word or match the target words with their Chinese meaning. Then, they return to Test mode to check their vocabulary mastery with instant feedback.

In the study, college EFL learners believed Quizlet could improve their English language skills. The findings in alignment with previous research that Quizlet could be uses to enhance learners' listening, speaking, reading, and writing skills (Bueno-Alastuey & Nemeth, 2022; Chen, 2015; Hikmah, 2019; Korkealehto & Siklander, 2018). Learners can practice their listening skills by listening to audio that contains word definitions from Quizlet's *spell* module. Additionally, learners can practice pronouncing words correctly with flashcards, and the *match* module trains reading comprehension. Typing the answers in the *test*, *study*, and *spell* modules requires writing proficiency. Participants' interview analysis results clarified it; participants stated that their reading skills were improved most, and listening skills speaking and listening skills also improved as there is a feature on Quizlet providing the sound of words. Especially, most participants mentioned that using Quizlet to learn English vocabulary can improve their English reading skills, just as Hsu et al. (2017) suggested the size of one's vocabulary has a significant impact on the process of

learning English, as possessing a vast vocabulary enables learners to deduce the meaning of English sentences.

The findings showed that college EFL learners positively perceived the ease of Quizlet due to its straightforward and easily understandable interface, which facilitated the acquisition of receptive and productive vocabulary knowledge in the English language. The results supported previous studies (Bueno & Nemeth, 2022; Çeçen, 2020; Prayogi et al., 2021; Van et al., 2020) which also investigated EFL learners' perceptions of the perceived ease of use Quizlet and found that students learning vocabulary with Quizlet who perceived the Quizlet as a user-friendly tool. One reason is that the interface of the Quizlet was clear and understandable for the participants to operate. The other reason may be that participants are skilled in using mobile phones, as Çeçen (2020) stated contemporary learners are often assumed to possess a high level of technological proficiency due to their upbringing in a society characterized by rapid technological advancements that have permeated various facets of daily existence. Therefore, the participants could master the operation in a short time. The findings supported by the semi-structured interview analysis; participants emphasized that it was easier to learn words with Quizlet since pictures associated with every word on Quizlet made the word more vivid for them to remember.

The results of the questionnaire analysis showed that although the participants were positive on *perceive usefulness* and *perceived ease of use*, they showed very positive *attitude* towards using Quizlet. The reason for this may be that in addition to feeling that Quizlet is easy to use and useful, Quizlet provides learners with a more exciting and varied way of practicing vocabulary. Other studies also highlighted that Quizlet could provide

learners an enjoyable learning experience (Aprilani, 2021; Cinar & Ari, 2019; Novitasari & Prijambodo, 2022; Rejeki et al., 2020; Setiawan & Wiedarti, 2020). Therefore, college EFL learns have a very positive attitude towards Quizlet and like to use Quizlet to learn receptive and productive vocabulary knowledge. Similar findings were obtained from other studies regarding the attitudes toward using Quizlet (Chaikovska & Zbarayska, 2020; Cho, 2021; Christian & Fortunata, 2023; Cinar & Ari, 2019; Jeong & Park, 2018; Lee & Koo, 2018; Sangtupim, 2019; Sonobe & Ogata, 2016) that learners hold positive attitude towards using Quizlet. The results also be proved by the semi-structured interview analysis results. The participants showed their positive opinions on the attitudes of Quizlet from the following aspects, the use of Quizlet is convenient, using Quizlet can test the mastery of vocabulary learning, the use of Quizlet provides users with enjoyable learning, and the use of Quizlet can promote learners' autonomy.

Although the participants had very positive attitudes towards using Quizlet in general, many disadvantages of Quizlet also emerged from the semi-structured analysis results that could make learners feel negative about using Quizlet, such as insufficient features, poor internet connection, advertising interference, and too much repetition. The other studies also found part of some learners do not like the use of Quizlet, as the study of Lam et al. (2018), who investigated the perceptions of the Quizlet as a tool for learning Chinese and found that the students did not think Quizlet could help them to pronounce Chinese characters, and both female and male students did not like printed Quizlet, in other words, Quizlet is not popular language learning tool among participants. According to Setiawan and Wiedarti (2020), it was observed that certain students exhibited a lack of focus on vocabulary learning through the use of Quizlet. These students were found to

engage in various activities on their phones, such as accessing applications like Instagram and Facebook, instead of utilizing the Quizlet application for its intended purpose.

Findings from the analysis of questionnaire and semi-structured interview showed that the college EFL learners' behavioural intentions for the future use of Quizlet were positive. Similar results were found in studies by Rejeki et al. (2020) and Van et al. (2020) who investigated the perceptions of EFL learners towards the use of Quizlet and found that EFL students showed a willingness to learn English vocabulary with Quizlet in the future. As previously indicated, participants in the Quizlet intervention utilized the application or website at least twice per week. In general, they showed positive views regarding Quizlet's usefulness and ease of use. The positive views regarding Quizlet's usefulness and ease of use have resulted in very positive attitudes among EFL learners towards its utilization. According to Arshad et al.'s (2012) revised Technology Acceptance Model that *perceive ease* and *perceived usefulness* would impact *attitudes*, and then impact on the *behavioural intention* towards the technology. The current study's results support the revised Technology Acceptance Model proposed by Arshad et al. (2012). Specifically, the findings indicate that college EFL learners hold positive perceptions regarding the perceived ease and usefulness of Quizlet. These positive views contribute to a positive attitude towards utilizing Quizlet and foster positive behavioural intentions to engage with the application.

5.5 High- and Low-level Proficiency Learners' Perceptions on Using Quizlet

This part only involves the quantitative data analysis findings on the perceptions of high- and low-level proficiency learners. As stated in Chapter 3, based on the average posttest scores of the receptive vocabulary knowledge test and the productive vocabulary knowledge test, the learners in the experimental group were high- and low-proficiency

level learners. High- and low-proficiency level learners' perceptions of using Quizlet were compared by conducting independent samples T-test to reveal the difference between them. The results show that there are no statistically significant differences between the two groups of learners' perceptions regarding Actual usage, Perceived ease of use, Perceived usefulness, and Attitudes. However, there are statistically significant differences (t = 2.245, p = 0.25 < 0.05) between the two groups regarding Behavioural intention of using Quizlet in the future. High-proficiency level learners showed very positive (M=4.13, SD=0.631) opinions on behavioural intention, while low-proficiency level learners showed positive (M=3.81, SD=0.744) behavioral intentions. This was particularly evident in their preference to use Quizlet for enhancing their receptive and productive vocabulary knowledge and their willingness to use Quizlet frequently after completing their college English course.

The factors contributing to this phenomenon can be elucidated through the Davis et al.' (1989) TAM model and revised TAM model proposed by Arshad et al. (2012). According to this model, the *perceived ease of use* and *perceived usefulness* of a particular technology can significantly influence an individual's attitude towards it, subsequently affecting their behavioural intention. In this study, high-level proficiency college EFL learners exhibit a more positive opinion on the actual usage and ease of use than low-level learners. Table 5.1 summarizes learners' perceptions of using Quizlet between high- and low- proficiency level learners. Consequently, it was found that high-level learners exhibited a stronger preference towards use of Quizlet in the future, particularly in their learning of both receptive and productive vocabulary knowledge.

Table 5.1: Summary of learners' perceptions on using Quizlet between high- and low-proficiency learners

	Actual use		PE		PU		Attitude		BI	
	M	*I*	*M*	*I*	*M*	*I*	*M*	*I*	*M*	*I*
High-	4.17	Very positive	4.02	Very positive	3.91	Positive	4.19	Very positive	4.13	Very positive
Low-	3.97	Positive	3.81	Positive	3.72	Positive	4.02	Very positive	3.81	Positive

Note: *M*=mean; *I*=interpret; High-=high-proficiency level learners.
Low-=low-proficiency learners
Very positive indicates a mean score in the range of 4.01 to 5.0.
Positive indicates a mean score in the range of 3.01 to 4.0

The research findings indicate that college EFL students with advanced proficiency perceived Quizlet as a highly valuable tool. Specifically, they reported that Quizlet facilitated a faster acquisition of English vocabulary and enhanced their productive vocabulary knowledge. The findings align with the study conducted by Çeçen (2020), which examined the perceptions of tertiary level EFL students in Turkey regarding the utilization of Quizlet. The study revealed that students with higher levels of proficiency achieved significantly higher mean scores compared to those with lower levels of proficiency, specifically in terms of their perceived usefulness of Quizlet. This suggests that students with higher levels of proficiency hold more favourable opinions towards Quizlet than their counterparts with lower levels of proficiency.

According to Çeçen (2020), it was argued that students with a higher level of proficiency demonstrated greater vocabulary knowledge and lexical capacity compared to students with a lower level of proficiency. Consequently, it is possible that Quizlet could have been more beneficial for students with a higher level of proficiency. For instance, individuals who utilized various features of Quizlet, such as flashcards, vocabulary tests,

and matching modes for vocabulary acquisition, may have been able to explore the diverse and extensive range of futures and benefits provided by Quizlet more effectively, thanks to their advanced lexical proficiency (Çeçen, 2020). Furthermore, Nation (2013, 2022) posited that individuals with greater proficiency may rely more heavily on their extensive knowledge of the target language to facilitate their learning process. This implies that learners who possess a larger vocabulary are more likely to experience enhanced ease in acquiring new words.

In China context, the situation also appeared; the high-level college EFL learners benefit more from trying diverse learning modes on the Quizlet. In comparison, low-level learners prefer the game mode, such as matching, as the model is more fun for them to learn vocabulary. As the match module provides learners with receptive vocabulary learning, not the productive vocabulary learning. According to Nation (2013, 2022), the most effective approach for acquiring receptive vocabulary knowledge is to engage in receptive learning. In terms of acquiring a comprehensive vocabulary, engaging in productive learning is the most effective approach. If there is a requirement for both receptive and productive usage, it is advisable to acquire vocabulary through both approaches. Generally, low-level learners preferred receptive learning such as the *match module*, and therefore, they may feel Quizlet was more beneficial for their receptive vocabulary knowledge performance.

The other reasons why college EFL learners had more positive behavioural intention in using Quizlet in the future depends on their willingness to study English or not in the future. In the Chinese context, for the low-level proficiency college EFL learners do not have the strong willingness to learn English in the future further, so they would not

have a strong willingness to use the Quizlet in the future. As for those low-level proficiency college EFL learners, the college English course is compulsory in college, but after finishing the course they would not need to learn English. While high-level Chinese college EFL learners would like to get a bachelor's degree, they must pass the entrance examination to continue their studies in the next stage; the English test is one of four entrance examinations in the next stage. Therefore, high-level learners are more willing to continue their English study and are more willing to use Quizlet to support their English vocabulary learning since they perceived the ease of use, the usefulness of Quizlet positively and hold very positive attitude towards using Quizlet.

In summary, college EFL learners could follow the teacher's instructions and assignments to finish their English vocabulary learning activities on Quizlet. During their actual use of Quizlet in their College English course, they perceived the ease of use and usefulness of Quizlet; then, they showed very positive attitudes toward using Quizlet. Based on the ease of use, usefulness, and positive attitudes toward using Quizlet, they showed their willingness to use Quizlet in the future. Based on these findings of the current study and previous studies, it is advisable to adopt Quizlet as an English vocabulary learning tool in their college English course.

5.6 Implication of the Study

The theoretical, methodological, and practical implications are identified as follows.

5.6.1 Theoretical Implication

In vocabulary learning and teaching, a systematic framework for vocabulary knowledge is provided by Nation's (2013, 2022) vocabulary model, which demonstrates

the multidimensionality and complexity of vocabulary knowledge. The vocabulary knowledge framework divides vocabulary knowledge into form, meaning, and use aspects, and each aspect is subdivided into receptive and productive vocabulary knowledge. Nation (2013, 2022) suggests the most effective learning methods based on the different aspects of vocabulary knowledge. The methods, including explicit learning, retrieval, repetition, and pictures, can effectively strengthen receptive and productive vocabulary knowledge of 'form-meaning' connection. The present study used Nation's vocabulary knowledge framework as a guide and took Quizlet, a digital gaming platform, as a vocabulary learning tool to investigate the receptive and productive vocabulary knowledge performance of college EFL learners during their college English course. Quizlet, as a digital game-based vocabulary learning platform, provides learners with Learn, Write, Match, Spell, and Flashcard modes. Learners can repeat the vocabulary learning through these modes. In this study, each word in the flashcard is accompanied by a corresponding picture and the corresponding Chinese vocabulary, which helps improve vocabulary learning efficiency. According to dual-coding theory (Paivio, 1971, 1986, 1991), it enhances learning and retention when information is encoded in both verbal and visual forms simultaneously (dual coding). This is because the brain has multiple pathways to access the information, increasing the likelihood of successful recall.

Moreover, Flashcard mode also applies to retrieve the corresponding Chinese vocabulary, which is not displayed simultaneously to enhance learners' retrieval, and retrieval can be added to improve the effect of vocabulary learning. Using Quizlet's Match mode, learners look at an English word and match its corresponding Chinese word, which is a kind of receptive learning process, i.e., seeing an English word and recalling its corresponding Chinese word. The Learn and Test modes can be set up according to the

learner's needs, either in multiple-choice or word-writing modes. The multiple-choice mode is for receptive learning, and the written mode is for productive learning. The present study was carried out in combination with Nation's Vocabulary Knowledge Framework and most effective vocabulary learning methods, and the results of the study showed that the learners' receptive vocabulary knowledge and productive vocabulary knowledge were higher than those of the control group, therefore, confirmed that Quizlet was effective in the learning of receptive and productive vocabulary knowledge of the college EFL learners. The results of the present study also further confirmed the effectiveness of Nation's Vocabulary Knowledge Framework and the most effective vocabulary learning method in learners' vocabulary learning. Future researchers and learners may take Nation's vocabulary knowledge Framework and the most effective vocabulary learning method as a guideline for further research and apply methods in vocabulary teaching and learning to promote the improvement of learners' vocabulary learning effectiveness.

Arshad et al.'s modified TAM model was used as a guide in this study to investigate learners' perceptions of using Quizlet as a tool for their vocabulary learning. The TAM model was proposed by Davis et al. (1989), which, as a framework for explaining individuals' behavior in adopting new technologies, focuses on how individuals' perceptions (perceived usefulness and perceived ease of use) and attitudes towards technology influence their behavioral intentions and actual use behavior. Davis et al.' (1989) TAM was initially a widely used model in information systems. However, as it has continued to develop, its application areas have expanded to multiple fields, including education. In the field of language learning, Arshad et al. (2012) modified the Davis et al.' (1989) TAM and applied it to the field of language learning. Cecen (2020) adopted the modified model of Arshad et al. (2012) and compared learners' perceptions of several

different vocabulary learning tools. In the current study, a deeper understanding of technology acceptance behavior could be gained by applying Arshad et al.'s (2012) TAM model to the study of Quizlet, a learning tool. By analyzing learners' perceptions of Quizlet, the study investigated how learners' perceived usefulness (e.g., whether Quizlet can improve vocabulary learning) and perceived ease of use (e.g., how easy it is to use, how user-friendly the interface is) affect their acceptance and willingness to use this tool.

The results of this study showed that the learners' college English course learning process, using Quizlet as a vocabulary learning tool, experiencing the Quizlet intervention, the learners felt that Quizlet could help them learn vocabulary effectively, and the easy-to-use interface of Quizlet made it easier for them to become skilled in using Quizlet. Through the Quizlet intervention, learners felt that Quizlet could help them learn vocabulary effectively. The user-friendly interface of Quizlet made it easier for them to become skillful in using Quizlet. The use of Quizlet in the college English classroom was more interesting than the traditional way of vocabulary learning. The learners had positive attitudes towards the use of Quizlet, so they showed their intention to use Quizlet in the future. The data analysis of the qualitative study shows the learners' perceptions in more detail in terms of perceived ease of use, perceived usefulness, and attitudes. Quizlet, as a learning tool, features personalized learning. The present study analyses learners' perceptions of Quizlet to understand their needs and expectations for personalized learning. Meanwhile, combined with the TAM model framework, it provides theoretical support and practical guidance on how to better meet Chinese College EFL learners' personalized learning needs by adopting Quizlet into their college English course learning.

5.6.2 Methodological Implication

The present study used non-equivalent control group design. Most of the existing research on the effects of Quizlet intervention did not have control group (Al-Malki, 2020; Cho, 2021; Hikmah, 2019; Korkealehto & Siklander, 2018; Senior, 2022). Although, these studies examined the effectiveness of Quizlet in vocabulary learning, but other factors, such as the practice effect, may be contributing to improvement (Sanosi, 2018). To eliminate potential factors that could coincidentally cause for gains by members of the experimental group, the approach employed in this study included an experimental and control group design with pre- and post-tests administered to each group. In addition, Said (2019) states that positive findings from research that lacks a control group to compare treatment outcomes with must be handled cautiously and cannot be generalized to the entire population, particularly if demographics differ.

The study's data were collected from four intact classrooms in a natural setting. Data obtained from human participants are susceptible to various research threats, one of which is the Hawthorne effect. This phenomenon refers to the tendency of individuals, particularly students, to modify their behaviour to present themselves in a favourable manner. This effect is particularly relevant in survey studies, where the interaction between researchers and participants is typically limited to a single occasion (Said, 2019). The extended duration of the intervention period facilitates the accurate representation of participants' characteristics in the data, rendering this form of data essential in the study of human subjects. Through the examination of participants within their natural environment, researchers can acquire valuable insights regarding the intervention. Consequently, the data obtained consists of genuine feedback from the participants. The responses provided an

account of the participants' perceptions, potentially offering novel evidence regarding the perspectives of college EFL learners on the intervention process.

The study employed a robust research methodology, albeit with a narrow focus on a sample drawn exclusively from one college. The study design employed in this research was a mixed-methods approach, which adhered to the principle of data triangulation. The quantitative findings obtained from the questionnaire were corroborated by the data derived from the semi-structured interviews. While many previous studies (Chaikovska & Zbaravska, 2020; Cinar & Ari, 2019; Lam et al., 2018; Waluyo & Bucol, 2021) only used quantitative method; the present study used a mixed method to triangulate the research findings. Furthermore, the test questions, questionnaire items and semi-structured interview protocol went through a validation process by experts. Meanwhile, the lesson plan, which was created independently, was checked by a teacher participant to make sure the content matched the college syllabus. The teacher also provided recommendations on the appropriateness of the activities regarding of the level of difficulty for the students.

Additionally, the current study adds to the body of knowledge by providing empirical support for a Quizlet intervention among EFL students in college. Most of the research on Quizlet intervention among college EFL students involved measuring the intervention's effects using receptive vocabulary knowledge performance. Although having a strong receptive and productive vocabulary knowledge is crucial to word knowledge. However, many studies' outcome measurements only tested receptive vocabulary knowledge performance using multiple-choice questions, Lin and Lin (2019) recommend that more research be done to explore the effects of digital game-based vocabulary application on both receptive and productive vocabulary knowledge

performance. The current study looked at how college EFL learners performed in terms of receptive and productive vocabulary knowledge using Quizlet intervention. Furthermore, the study's empirical data on productive and receptive vocabulary knowledge performance can aid readers in visualizing what occurs when the Quizlet intervention program is implemented.

Most of the previous research has primarily focused on investigating the effect of Quizlet on the acquisition of vocabulary (Al-Malki, 2020; Chaikovska & Zbaravska, 2020; Cho, 2021; Hikmah, 2019; Senior, 2022). To effectively incorporate technology into a different setting, it is crucial to thoroughly examine both its effects and perceptions of learners regarding the technology (Hsu, 2013). Despite the potential motivational benefits of vocabulary acquisition through digital game-based methods, the open nature of this innovative instructional approach is still perceived as novel and demanding for students with diverse cultural backgrounds (An & Williams, 2010). The empirical research on Quizlet in China has primarily been done in Taiwan. Chien (2013) investigated how Taiwanese EFL students felt about creating Quizlet flashcards for vocabulary, and Chien (2015) investigated how well the Quizlet flashcard website improved learners' vocabulary knowledge performance. There needs to be more research about Quizlet in China's mainland. Because there has been little research on the effects and perceptions of Quizlet application on EFL college English learners' vocabulary acquisition concurrently in China, the present study filled the gap and laid the grounding for future replication in the EFL context and China.

The integration of science and technology in academic settings, specifically within university and college classrooms, has become increasingly prevalent. The findings of this

research have yielded empirical support for the effectiveness of Quizlet as an aid for enhancing vocabulary acquisition among college EFL learners. Additionally, the study has shed light on the attitudes and perspectives of these learners towards the utilization of Quizlet in their language learning endeavours.

5.6.3 Practical Implications

Three practical implications based on the research findings were presented in this section, including implications for English language teachers, implications for policy makers and implications for Quizlet development team.

5.6.3.1 Pedagogical Implications

Vocabulary learning through a digital game-based tool such as Quizlet should be implemented in the college English classroom, as shown in this study, to improve the performance of college EFL learners learning English vocabulary. It is hoped that with the empirical findings presented in this study, college English course teachers will be aware of an alternative method to traditional classroom instruction to improve college EFL learners' vocabulary acquisition. Teachers who use Quizlet as a vocabulary learning tool in the classroom will benefit from a fun and effective vocabulary learning tool. As Huang et al. (2017) argued, there exists a multitude of high-quality educational applications. Language instructors can derive advantages from curating a selection of these applications to integrate technology-based teaching methods into their instructional practices. This integration can foster increased student motivation and engagement within a meaningful learning context.

The attractiveness and user-friendly nature of Quizlet contribute to its increased acceptance and utilization among college EFL learners. According to Aprilani (2021), Quizlet can be utilized by teachers as an instructional tool in English classrooms. Furthermore, the implementation of Quizlet can enhance the enjoyment and engagement of students during the learning process. Given the findings of the present study and the extant literature, it is pertinent to contemplate the incorporation of Quizlet-based vocabulary acquisition within college-level English courses. Teachers can provide students with guidance and training on how to use Quizlet, recommend and encourage students to use Quizlet in college English classes, and use Quizlet for after-class vocabulary learning practice. Before adopting Quizlet in their classroom activities, teachers should have knowledge about the use of Quizlet; if teachers themselves have no knowledge about the application in mobile devices and how to integrate them in the classroom, it will be impossible to create activities by integrating technology in a language classroom.

According to the interview results, college English teachers should pay attention to the number of words in a word set when creating a word set on Quizlet. Ashcroft et al. (2018) argued that it is crucial to consider the optimal number of items for a learning set. This is because the participants stated they felt tired if there were too many words in a word set. The participants explained that 10-15 words in a word set would be comfortable for them to learn according to their experience. However, Kornell (2009) asserted that the spacing effect indicates that a large block size is more effective than a small one. On the other hand, Nakata (2011) contended that the retrieval practice effect favors smaller block sizes. Depending on the learner's skill level, Nation (2008) recommended studying 20 to 50 cards during a learning session. Additionally, Suppes and Crothers (1967) found in another study that it should be about 20 cards for learners at a lower level and up to 50

cards for learners at a higher level. This is because each study set required a significant amount of time, which made the Quizlet tiresome for students because each activity repeated the same exercises (Al-Malki, 2020).

Most of the college EFL learners stated that Quizlet is an interesting and effective vocabulary learning tool for them; they hope that teachers should supervise their study after class because they lack self-discipline when they study by themselves. The English proficiency level of college EFL learners is relatively low overall; their motivation to learn English urgently is not very strong, so a monitoring system is needed for college English teachers to create. As Waluyo and Bucol (2021) claimed, technology has limitations; students need the initiative, motivation, and disciplinary habits to explore the vocabulary sets at home to ensure significant improvement is achieved.

5.6.3.2 Implications for Policy Makers

According to the College English Curriculum Requirements released by the Ministry of Education of the People's Republic of China on April 25th, 2008, the primary objective of college English instruction is to foster students' proficiency in English language application, with particular emphasis on listening and speaking skills. This proficiency is intended to enable effective communication in English during their future academic pursuits, professional engagements, and social interactions. Additionally, the curriculum aims to enhance students' capacity for self-directed learning, elevate their overall cultural competence, and cater to the demands of China's societal progress and global communication.

To achieve the aim of College English Curriculum Requirements, vocabulary acquisition takes an important role. As Cinar and Ari (2019) argued, students should know

the words to successfully achieve listening, speaking, writing, and reading four skills; it is only possible to improve these skills with a vast vocabulary (p.61). Quizlet has been proven effective in college EFL learners' vocabulary learning, and the learners also showed their positive perceptions towards using Quizlet. Therefore, policymakers could encourage more colleges and college English teachers to adopt digital game-based application, such as Quizlet as a vocabulary learning tool in their classes.

One of the major problems mentioned when using Quizlet in college EFL learners' vocabulary learning is the poor internet connection in this study. The college EFL learners showed their favourable to using Quizlet, but the poor internet connections always annoyed them when doing vocabulary practice activities in the classroom. Therefore, the government should provide more funding and support to the colleges to provide students with free WIFI so they can use Quizlet in the classroom more smoothly. In the other study by Chien (2015), he also pointed out the three most significant problems that learners encountered, including an inability to log in to the website, unfamiliar with the website, and slow internet service. Universities should receive more financial support from the government to provide students with good wireless network support or set up a foreign language lab with computers to alleviate the problem of students' inability to log in to Quizlet to study during the class time due to slow network or network congestion.

5.6.3.3 Implications for Quizlet Development Team

Numerous empirical studies have been conducted to examine the effects of utilizing Quizlet as a tool for vocabulary acquisition, consistently demonstrating the efficacy of Quizlet in facilitating the learning of English vocabulary (Ali & Kassel, 2018; Cinar & Ari, 2019; Korlu & Mede, 2018; Okkan & Aydin, 2020; Sanosi, 2018). Furthermore, this study

also proved that Quizlet is effective for EFL learners in China, and the results showed that college EFL learners in China have a positive attitude toward using Quizlet. However, the interview analysis revealed some inconveniences of Quizlet for Chinese learners. For example, in China, except iPhones and other brands of mobile phones cannot install and use the Quizlet application because the applications on Google Store cannot be installed on other brands of mobile phones in China, such as Android system phones and Harmony OS system phones. However, there are very few college students in China who own an iPhone, so most students can only use the web version of Quizlet to study in class.

When learning vocabulary using the web version of Quizlet in China, sometimes it takes effort to log in to the web page, and users sometimes forget the password, and it is more tedious to log in again. Also, on the web version, if users try to exit an exercise module, users will exit the entire Quizlet page if users are not careful. After logging back in, students' learning traces are sometimes erased, and students may not want to use Quizlet again. The Quizlet development team should consider making the web version as easy to log into and save as the app. In terms of game functions, matching is the only game function that can be used on the mobile web page, and when the game "Gravity" is operated on the computer, college EFL learners in China stated that the game "Gravity" fell too fast for them, before they finished entering the Chinese characters, the asteroid fell. This game did not make the Chinese EFL learners happy but somewhat depressed. The developers of Quizlet should consider the situation of English learners in China and improve the features of Quizlet, add more easy-to-use game features, and improve the convenience of the login interface of the web version of Quizlet. The design of the web version needs to be as simple and easy to use as the app, and it could store the practice records of Quizlet web version users.

EFL learners in China stated that they like Quizlet as a vocabulary learning tool but need more sample sentences on Quizlet. For Chinese students who like to learn words with sample sentences to help them understand words, they prefer to be provided with simple sample sentences on Quizlet to help them understand words. According to Barr (2016), it is insufficient for learners to solely rely on word translation as a means of understanding vocabulary. Instead, learners must acquire knowledge of the specific contexts and circumstances in which words are employed, as well as familiarize themselves with typical word collocations. As stated by Barr (2016), it is common for these words to appear both preceding and following the target words. The study conducted by Al-Malki (2020) posited the need for Quizlet designers to enhance their application by integrating a broader range of language skills into the vocabulary learning process. This includes incorporating speaking, grammar, and writing exercises that involve constructing paragraphs using the learned words. By doing so, vocabulary acquisition can occur within an authentic context. According to Chien (2015), it is insufficient to teach and learn words in isolation or solely focus on their meanings when aiming to develop learners' word knowledge.

5.7 Recommendations for Future Research

This section of the study presents the recommendations for future research based on the research findings obtained in the current study. Numerous research studies have extensively investigated foreign language learning and vocabulary acquisition through Quizlet. However, further enhancing our understanding of Quizlet's potential benefits is imperative.

First, this study demonstrated that integrating Quizlet into the college English course for EFL learners can substantially enhance their receptive and productive

vocabulary knowledge of "form-meaning" connection, surpassing the outcomes of traditional vocabulary learning methods. However, as stated by Nation (2013), knowing words encompasses a comprehensive understanding of the three primary aspects of a word, namely its form, meaning, and use. According to Chien (2015), Quizlet focuses mainly on the aspects of "form-meaning" connections and "written forms". However, there is no additional evidence to support the belief that Quizlet is incapable of improving vocabulary knowledge in other aspects of learning. Therefore, future studies could direct their attention toward alternative dimensions of word comprehension to conduct a more comprehensive examination of the potential effectiveness of Quizlet in facilitating the learning of various vocabulary knowledge.

Second, the present study only demonstrated that using Quizlet positively affected the recall of vocabulary knowledge concerning receptive and productive vocabulary. Future research endeavours may consider directing their attention toward conducting recall and retention tests to delve deeper into the efficacy of Quizlet as a tool for enhancing vocabulary knowledge recall and retention. Hence, in subsequent studies, it is recommended that participants be administered retention tests to assess their long-term memory retention. For instance, following a two-week interval from the first posttest, a subsequent delayed posttest could be administered to assess the potential of Quizlet in enhancing the long-term retention of vocabulary among college ELF learners compared to the conventional vocabulary learning approach.

Finally, the collection of data was accomplished by means of administering questionnaires and conducting semi-structured interviews. These methods facilitated the discovery that college EFL students demonstrated favourable dispositions towards the

integration of Quizlet as a tool for enhancing their English language acquisition within the context of higher education. Furthermore, the learners in this study expressed favourable attitudes towards the ease of use and utility of Quizlet. Additionally, the results revealed that the participants exhibited a favourable disposition towards their future intention to utilize Quizlet. Nevertheless, there has been a lack of research examining the perspectives of educators regarding college-level English courses. Therefore, future research endeavours may prioritize the examination of college English instructors' perspectives on the utilization of Quizlet as a means of enhancing vocabulary acquisition.

5.8 Conclusion

The present study investigated the effects of utilizing Quizlet on the vocabulary acquisition outcomes of college students learning English as a foreign language. Furthermore, the study examined the perceptions and attitudes of these learners in relation to the utilization of Quizlet. The results of the study demonstrate that the utilization of Quizlet led to significant improvements in both receptive and productive vocabulary knowledge performance among college EFL learners. The participants exhibited primarily favourable perceptions and attitudes towards using of Quizlet as a means of enhancing their acquisition of English vocabulary.

Most participants, including individuals with high- and low proficiency levels, exhibited positive attitudes towards using Quizlet. Regarding the perceptions of the actual use of Quizlet, the usefulness of Quizlet, and attitudes towards its use among college EFL learners, most participants expressed positive views. The study examined the participants' perceptions of Quizlet's ease of use and usefulness and their attitudes toward incorporating Quizlet into their college English vocabulary learning. The findings revealed a significant

inclination among the participants to use Quizlet in their future learning activities. In contrast, the learners with low proficiency demonstrated a significantly lower mean score in behavioural intention compared to those with high proficiency. This indicates that low-level learners exhibited a lower level of preference to use Quizlet in the future when compared to high-level learners in terms of their behavioural intention.

This study investigated the effects of using Quizlet in college English courses to assist college EFL learners in vocabulary learning. The study examined the Quizlet's effects on receptive and productive vocabulary knowledge performance. The enhancements in their vocabulary attainment following the implementation of Quizlet are observable. The study recommends the integration of Quizlet into college English classrooms in China based on the obtained findings. The study provides evidence, through the analysis of surveys and semi-structured interviews, that an enhancement in receptive and productive vocabulary knowledge leads to improvements in other language skills, including reading, listening, writing, and speaking skills. Hence, it is recommended to consider the potential benefits of incorporating Quizlet to facilitate vocabulary learning among college EFL learners within the Chinese educational setting.

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APPENDICES

Appendix A：Receptive Vocabulary Knowledge Test (Chinese version)

1. 姓名_____

2. 学号_____

一、填空题（本题共 60 小题，满分 120 分）

1.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 exit

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。（2 分）

2.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 ignore

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

3.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：hesitate

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

4.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：notify

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

5.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：fasten

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

6.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 spacious

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

7.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 worn

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

8.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 fantastic

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

9.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 military

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

10.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 splendid

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

11.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：dynasty

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

12.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：sedan

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13.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：名词 beacon

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14.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：emperor

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15.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：legacy

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16.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：desire

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17.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 investigate

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18.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：suppose

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19.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 alert

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20.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：decline

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21.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 embarrassing

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22.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 given

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23.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 acceptable

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24.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 super

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25.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：official

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26.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：notation

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27.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：名词 executive

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28.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：identity

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

29.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：skiing

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30.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：embassy

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31.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：combat

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32.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：omit

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33.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：flicker

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34.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 access

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35.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 confuse

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36.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 facial

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37.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 interactive

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38.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 grateful

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39.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：形容词 curious

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40.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：名词 cyber

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41.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：名词 blessing

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42.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：browser

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43.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：addict

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44.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：appetizer

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45.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：slang

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46.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 wrap

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47.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：动词 reason

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48.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：strive

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49.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：commit

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50.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：deliver

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51.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：accountable

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52.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：conventional

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53.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：memorable

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54.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：clueless

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55.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：mega

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56.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：transaction

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57.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：allowance

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58.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：pottery

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59.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：souvenir

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60.请写出下列英语单词对应的汉语意思，请只写一个答案，并注意标注的单词词性。

问题：warranty

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Appendix B：Productive Vocabulary Knowledge Test (Chinese version)

1. 姓名_____

2. 学号_____

一、填空题（本题共 60 小题，满分 120 分）

1.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

He e_____ed from the changing rooms.

他离开了更衣室。

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2.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

It would be a mistake to i_____e his opinion.

忽略他的意见是不对的。

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3.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

I didn't h_____e for a moment about taking the job.

我毫不犹豫地接受了那份工作。

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4.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

Please n_____y them of the change of the office's address.

请把办公地址的更改通知他们。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

5.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

F_____n seat belt while seated.

就坐后请系好安全带。

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6.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

The accommodation is simple but s_____s.

住处简朴但宽敞。

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7.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

Can we sit down? I'm w_____n out.

我们能坐下吗？我都累坏了。

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8.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

I have a f_____c social life.

我有着极好的社交生活。

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We may have to take m_____y action.

我们可能不得不采取军事行动。

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10.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

I am going to a s_____d house in Frankfurt.

我要去法兰克福的一个豪华（极好的）住宅。

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The song was composed during the Qing D_____y.

这首歌是在清朝（朝代）创作的。

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It will be known as the s_____n car at the time.

当时，它将被称为轿车。

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The pavilion was made by grey bricks and was settled up on the old b_____n tower.

亭由灰砖砌成，砌在原先的烽火台上。

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14.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

The e_____r had nothing on.

皇帝什么也没有穿。

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15.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

We are the keepers of this l_____y.

我们是这个遗产的保存者。

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We all d_____e health and happiness.

我们都渴望健康和幸福。

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We should i_____e what happened, what went wrong.

我们应该调查发生了什么事情，什么地方出了问题。

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S_____e someone gave you an egg and asked you to describe exactly what was inside.

假设某人给你一个蛋并要你准确描述里面的东西。

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19.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

He wanted to a_____t people to the activities of the group.

他想警告人们注意这个组织的行动。

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I offered to give them a lift but they d_____ed.

我主动邀请他们搭车，但他们婉言谢绝了。

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We have all been in similar e_____g situations.

我们都遇到过类似的尴尬局面

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They were to meet at a g_____n time and place.

他们要在规定的（安排好的）时间和地点会晤。

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23.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

We want a political solution that is a_____e to all parties.

我们需要一个各方都可接受的政治解决方案。

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We had a s_____r time in Italy.

我们在意大利过得十分惬意（极好的）。

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The o_____l launch date is in May.

正式的发行日期是在五月。

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26.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

There’s a n_____n and address in the journal.

在日记里有个符号和地址。

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The heroine is a senior TV e_____e.

女主人公是一位电视台高级主管。

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28.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

The man’s i_____y remains unknown.

这名男子的身份还是个谜。

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We go s_____g most weekends in winter.

我们在冬天的周末大多去滑雪。

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A crowd began to collect in front of the e_____y.

人群开始聚集在大使馆的前面。

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31.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

Did the old heroes c_____t there?

老英雄们在那里战斗吗？

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I'll o_____t it from now on.

从现在起我就省略它。

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Small fires still f_____r across a landscape in Hell.

而余火仍然在地狱般的林间闪烁着。

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34.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

You’ve illegally a_____sed and misused confidential security files.

你已经非法获取（访问）并盗用了机密文件。

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I always c_____e my left with my right.

我总是混淆左右。

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You’ve got that f_____l expression down.

你记住了那个面部表情。

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This will make computer games more i_____e than ever.

这将使电脑游戏比以前更具交互性（互动的）。

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I am extremely g_____l to all the teachers for their help.

我非常感谢所有老师的帮助。

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Everyone was c_____s as to why Mark was leaving.

马克为什么要离去，大家都感到好奇。

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It shares this with the c_____r threat.

它和网络威胁在这一点上是相同的。

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Lack of traffic is one of the b_____gs of country life.

往来车辆少是乡村生活的一大好处（好事）。

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Did he restart his b_____r?

他试过重启浏览器么？

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What an Internet a_____t usually does?

一个网络成瘾者通常会做些什么？

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44.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

Seafood soup is a good a_____r.

海鲜汤是一道很好的开胃菜。

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45.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

He tends to use a lot of s_____g expressions that I’ve never heard before.

他往往用许多我以前从未听说过的俚语。

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46.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

He spent the evening w_____pping up the Christmas presents.

他花了一个晚上的时间把圣诞礼物都包了起来（包装）。

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47.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

She r_____ned that she must have left her bag on the train.

她断定（推理）准是把包落在火车上了。

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Should a leader s_____e to be loved or feared?

领导者应该努力让人爱还是让人怕？

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Both sides c_____tted themselves to settle the dispute peacefully.

双方承诺和平解决争端。

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50.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

We promise to d_____r within 48 hours.

我们承诺在 48 小时内送到（递送）。

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51.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

Someone must be held a_____e for the killings.

必须有人要对这些凶杀事件负责。

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And it has turned c_____l thinking about foreign aid on its hand.

它也转变了对国外援助的传统看法。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

53.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

It has the m_____e events we have experienced together.

那里有我们一起经历过的难忘的（值得纪念的）事情。

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54.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

You’re c_____s about how to deal with the word.

你对如何应付世界一无所知。

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55.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

He has signed a m_____a deal to make five movies.

他签了一笔拍五部电影的大（极大的）交易。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

56.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

The t_____n is completed by payment of the fee.

交易在支付费用之后就完成了。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

57. 请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

The television comes with a full two-year w_____y.

这台电视机有整两年的保修期（保修单）。

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58.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

This is a typical example of Roman p_____y.

这是一件典型的罗马陶器。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

59.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

Please accept this little gift as a s_____r.

请接受这个小礼物作为纪念品。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

60.请根据单词的首字母和尾字母提示写出空缺的部分，请只写空缺部分字母，或填写完整的单词。

My a_____e was sufficient to afford my mom’s birthday gift.

我的零用钱足够给妈妈买一份生日礼物。

本测试只用于学术研究，对您的期末及平时考核成绩没有任何影响，您的个人信息将会严格保密。如果您同意参与本测试请继续答题。

Appendix C: Source of Pilot Study Questionnaire Items

1.Actual System Usage

Source	Original item	Adapted/Adopted item		Construct
Çeçen, 2020	I always use Quizlet to learn English.	Adapted	I always use Quizlet to learn English vocabulary.	Actual System Usage
Çeçen, 2020	I believe that using Quizlet can improve my language competency.	Adapted	I believe that using Quizlet can improve my vocabulary knowledge.	Actual System Usage
Cho,2021	Quizlet helped me study English vocabulary, so I think it would be good to use it even after entering high school in the future.	Adapted	I think it would be good to use Quizlet even after finish college English course in the future.	Actual System Usage

2.Perceived Usefulness

Source	Original item	Adapted/Adopted item		Construct
Çeçen, 2020	The use of Quizlet helped me to improve my reading skills.	Adapted	The use of Quizlet helped me to improve my reading skills.	Perceived Usefulness
Çeçen, 2020	The use of Quizlet helped me to improve my writing skills.		The use of Quizlet helped me to improve my reading skills.	
Çeçen, 2020	The use of Quizlet helped me to improve my speaking skills.		The use of Quizlet helped me to improve my speaking skills.	
Çeçen, 2020	The use of Quizlet helped me to improve my listening skills.		The use of Quizlet helped me to improve my vocabulary.	
			The use of Quizlet helped me to improve my grammar.	

Çeçen, 2020	The use of Quizlet helped me to improve my vocabulary.			
Cho,2021	Quizlet improved my English vocabulary.			
Çeçen, 2020	The use of Quizlet helped me to improve my grammar.			
Cho,2021	Quizlet strengthened My English vocabulary proficiency.	Adopted	Quizlet strengthened my English vocabulary proficiency.	Perceived Usefulness

3.Attitude towards use

Source	Original item	Adapted/Adopted item		Construct
Çeçen, 2020	The use of Quizlet is useful for my studies.	Adopted	The use of Quizlet is useful for my studies.	Attitude towards use
Çeçen, 2020	The use of Quizlet is useful to work together with my classmates.	Adopted	The use of Quizlet is useful to work together with my classmates.	Attitude towards use
Çeçen, 2020	The use of Quizlet is a good strategy in learning English.	Adapted	The use of Quizlet is a good strategy in learning English vocabulary.	Attitude towards use
Çeçen, 2020	The use of Quizlet is important for learning English.	Adapted	The use of Quizlet is important for learning English vocabulary.	Attitude towards use
Çeçen, 2020	The use of Quizlet is useful to interact with my classmates.	Adopted	The use of Quizlet is useful to interact with my classmates.	Attitude towards use
Çeçen, 2020	The use of Quizlet is useful to interact with my teacher.	Adopted	The use of Quizlet is useful to interact with my teacher.	Attitude towards use
Çeçen, 2020	When compared to traditional classroom learning,	Adapted	When compared to traditional classroom vocabulary learning, the use	Attitude towards use

	the use of Quizlet made my learning more entertaining.		of Quizlet made my vocabulary learning more entertaining.	
Çeçen, 2020	When compared to traditional classroom learning, the use of Quizlet made my learning less stressful.	Adapted	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning less stressful.	Attitude towards use
Çeçen, 2020	When compared to traditional classroom learning, the use of Quizlet made my learning more comfortable.	Adapted	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more comfortable.	Attitude towards use
Çeçen, 2020	When compared to traditional classroom learning, the use of Quizlet made my learning more diverse.	Adapted	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	Attitude towards use
Çeçen, 2020	When compared to traditional classroom learning, the use of Quizlet made my learning more creative.	Adapted	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more creative.	Attitude towards use
Çeçen, 2020	When compared to traditional classroom learning, the use of Quizlet made my learning more effective.	Adapted	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective.	Attitude towards use
Çeçen, 2020	Please rate how much you agree or disagree with the following statement: The advantage of using Quizlet overweighs the disadvantages of using it.	Adopted	Please rate how much you agree or disagree with the following statement: The advantage of using Quizlet overweighs the disadvantages of using it.	Attitude towards use
Çeçen, 2020	Please rate how much you agree or disagree with the	Adapted	Quizlet helped me be more active in learning English vocabulary.	Attitude towards use

	following statement: Quizlet helped me be more active in learning English.			
Cho,2021	It was inconvenient to learn English through Quizlet, so it was more comfortable for the teacher to teach me in class.	Adopted	It was more comfortable for the teacher to teach me English in class through Quizlet.	Attitude towards use

4.Perceived Ease of Use

Source	Original item	Adapted/Adopted item		Construct
Çeçen, 2020	For me, it is easy to learn English through Quizlet.	Adapted	For me, it is easy to learn English vocabulary through Quizlet.	Perceived Ease of Use
Çeçen, 2020	For me, it is easy to use Quizlet.	Adopted	For me, it is easy to use Quizlet.	Perceived Ease of Use
Çeçen, 2020	For me, it is easy to become skillful in using Quizlet.	Adopted	For me, it is easy to become skillful in using Quizlet.	Perceived Ease of Use

5.Behavior intention towards the use of Quizlet.

Source	Original item	Adapted/Adopted item		Construct
Van, et, al., 2020	I want to learn English vocabulary with Quizlet in the future.	Adapted	I want to learn English vocabulary with Quizlet in the future.	
			I want to learn English receptive vocabulary knowledge with Quizlet in the future.	
			I want to learn English productive vocabulary knowledge with Quizlet in the future.	

Masrom, 2007	I will return to E-learning often.	Adapted	I will use Quizlet often.
Park, 2012	I am going to positively utilize mobile learning.	Adapted	I am going to positively utilize Quizlet to learn English vocabulary.
Seleviciene & Burkšaitiene, 2015	I will add Web 2.0 applications as another medium to learn English.	Adapted	I will add Quizlet as another medium to learn English.
Cho,2021	Quizlet helped me study English vocabulary, so I think it would be good to use it even after entering high school in the future.	Adapted	Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.

Appendix D: Interview Protocol

Interview Protocol

Introduction

Hi! I am Pan Huanting, thank you for agreeing to let me interview you. Today's interview is about your opinion on vocabulary learning using Quizlet. Our interviews will be recorded and recorded for academic purposes only. Your personal information will not be disclosed or identified for publication. If you feel uncomfortable during the interview, you can stop the interview at any time. Would you agree to start the interview now?

Actual System Usage:

Do you always use Quizlet to learn English vocabulary this semester?

Q: Do you often use Quizlet to learn English vocabulary this term? Did you use Quizlet to learn words every week this term?

Q: Twice a week or more?

Q: Do you use Quizlet to learn English vocabulary after completing your weekly vocabulary exercise assignment on Quizlet?

Q: Do you think that Quizlet can help you improve your knowledge of English vocabulary?

Q: Do you think using Quizlet can increase your receptive vocabulary knowledge of English? That is, to help you learn such vocabulary knowledge that when you see an English word, for example, you can write its Chinese meaning.

Q: Do you think using Quizlet can increase your productive vocabulary knowledge of English? That is to help you learn such vocabulary knowledge, such as if you want to express an English meaning, so that you can write the English word correctly.

Perceived Usefulness:

Q: Do you think Quizlet is a useful learning tool? If so, why?

Q: Do you think Quizlet is a useful learning tool for your English vocabulary learning? If so, why do you think so? What features have helped you?

Q: Do you think Quizlet can help you learn English words more quickly than not use it?

Q: Has your English receptive vocabulary knowledge increased by using Quizlet?

Q: Has your English productive vocabulary knowledge increased by using Quizlet?

Q: Do you think it is become easier or not to learn English productive vocabulary knowledge by using Quizlet? Whether is it become easier for you to learn receptive vocabulary by using Quizlet?

Q: Do you think the use of Quizlet has helped you improve your reading skills, writing skills, speaking skills, listening skills and grammar skills?

Q: Do you think Quizlet is good for your English vocabulary learning? Is it helpful for your English vocabulary learning?

Attitude towards use:

How did you feel about learning vocabulary through Quizlet? (Adapted from Chien ,2015)

Which functions or games in Quizlet do you use the most?

Q: What do you think of learning English vocabulary by using Quizlet?

Q: Which functions on Quizlet do you use most, such as test mode, matching, writing, learning, flashcards, and spell mode?

Q: Do you usually use computer or mobile phone to log into Quizlet to learn English words?

Q: Do you like learning English vocabulary with Quizlet? That is to say, do you have a positive attitude towards using Quizlet to learn English vocabulary? Or a negative attitude?

Q: Do you think using Quizlet is better to learn receptive vocabulary or productive vocabulary, or is helpful to learn both receptive and productive vocabulary knowledge?

Q: Do you feel that using Quizlet helps to interact with classmates or teachers? For example, it will make you happy seeing your time is shorter than others' time or the ranking is better than other students when doing matching mode exercise? And when you know that the teacher can see whether students have completed exercise on Quizlet, and then would you strengthen the use of Quizlet to learn words more consciously?

Q: What do you think are the advantages of using Quizlet compared with traditional classroom vocabulary teaching and learning? (More interesting, less stressful, more comfortable, more diversified, more innovative, and more efficient in vocabulary learning).

Q: Do you think it is better for our teachers to teach vocabulary learning in the classroom in high school or junior high school, or do you prefer this way of using Quizlet to learn vocabulary?

Q: Does the use of Quizlet make you like learning English words better? Are you more focused on when learning English words with Quizlet?

Perceived Ease of Use:

Q: Do you feel that it is easy or difficult to use Quizlet?

Q: Why is Quizlet easy to use? Why is not easy to use?

Q: Do you think Quizlet is easier or more difficult to use? Do you think Quizlet is easy to use, or is it more difficult to use?

Q: why is Quizlet easier or why is it difficult to use?

Q: Do you think the interface of Quizlet is clear and easy to understand, or it is difficult to use?

Q: For you is it easy to use Quizlet or it is difficult to use it？

Q: For you, is it easy to learn English productive vocabulary knowledge by Quizlet or difficult by it?

Q: For you, is it easy to learn English receptive vocabulary knowledge by Quizlet or difficult by it?

Q: Are there any difficulties in using Quizlet to learn vocabulary? For example, the network connection is not good, you can't open the page, or you are annoyed by the repetition of words you have learned, or what shortcomings do you think Quizlet has in vocabulary learning?

Behavioral Intention:

Q: Do you want to learn English vocabulary with Quizlet in the future?

Q: Do you want to continue to use Quizlet to learn English vocabulary in the future?

For example, in the future, will you using Quizlet to prepare for CET-4 and CET-6 words you can't master? Will you continue to use Quizlet when you just want to learn English?

Q: Do you think Quizlet has helped you learn college English vocabulary? Do you still want to use Quizlet to learn English vocabulary after the college English course is over?

Appendix E Skewness and Kurtosis Scores of Variables of Pilot Study

Items	Skewness	Kurtosis
Q1. I always use Quizlet to learn English vocabulary this semester.	-1.258	.641
Q2. I use Quizlet to learn English vocabulary at least twice every week this semester.	-1.696	2.017
Q3. I use Quizlet to learn English vocabulary at least once every week this semester.	-1.225	.350
Q4. I only use Quizlet to complete my vocabulary assignment every week.	-.933	.487
Q5. After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.	-.470	-.069
Q6. I believe that using Quizlet can improve my English vocabulary knowledge.	-.367	-.881
Q7. I believe that using Quizlet can improve my English language competency.	-.164	-.870
Q8. I believe that using Quizlet can increase my English receptive vocabulary knowledge.	-.198	-.778
Q9. I believe that using Quizlet can increase my English productive vocabulary knowledge.	-.216	-.866
Q10. Quizlet helped me learn English vocabulary more quickly.	-.277	-.992
Q11. My English vocabulary was improved by using Quizlet.	-.459	-.408
Q12. My Receptive vocabulary knowledge was improved by using	-.452	-.145
Q13. My Productive vocabulary knowledge was improved by using	-.220	-.810
Q14. With Quizlet, learning English vocabulary was easier to me.	-.118	-.869
Q15. With Quizlet, learning English receptive vocabulary knowledge was easier to me.	-.451	-.290
Q16. With Quizlet, learning English productive vocabulary knowledge was easier to me.	-.003	-.808
Q17. Quizlet was a useful tool for my English receptive vocabulary knowledge study.	-.340	.009
Q18. Quizlet was a useful tool for my English study.	-.421	-.354
Q19. Quizlet was a useful tool for my English productive vocabulary knowledge study.	-.234	-.561
Q20. The use of Quizlet helped me to improve my reading skills.	-.125	-.560
Q21. The use of Quizlet helped me to improve my writing skills.	-.218	-.040
Q22. The use of Quizlet helped me to improve my speaking skills.	-.055	-.295
Q23. The use of Quizlet helped me to improve my listening skills.	-.162	-.039
Q24. The use of Quizlet helped me to improve my vocabulary.	-.412	.092

Q25. The use of Quizlet helped me to improve my grammar.	.000	-.169
Q26. Quizlet is useful for my English vocabulary learning.	-.577	-.273
Q27. I have a generally favorable attitude towards using Quizlet learning English vocabulary.	-1.241	2.459
Q28. I have a generally favorable attitude towards using Quizlet to learn English receptive vocabulary knowledge.	-.702	.199
Q29. I have a generally favorable attitude towards using Quizlet to learn English productive vocabulary knowledge.	-.829	.421
Q30. I believe it is (would be) a good idea to use Quizlet for English vocabulary learning.	-.985	.955
Q31. I believe it is (would be) a good idea to use Quizlet for English receptive vocabulary knowledge learning.	-.496	-.331
Q32. I believe it is (would be) a good idea to use Quizlet for English productive vocabulary knowledge learning.	-.496	-.331
Q33. I would like to use Quizlet learning English vocabulary.	-.551	-.399
Q34. I would like to use Quizlet learning English receptive vocabulary knowledge.	-.480	-.193
Q35. I would like to use Quizlet learning English productive vocabulary knowledge.	-.429	-.564
Q36. The use of Quizlet is useful to work together with my	-.434	-.441
Q37. The use of Quizlet is a good strategy in learning English	-.239	-.894
Q38. The use of Quizlet is a good strategy in learning English Receptive vocabulary knowledge.	-.369	-.384
Q39. The use of Quizlet is a good strategy in learning English productive vocabulary knowledge.	-.202	-.973
Q40. The use of Quizlet is important for learning English	-.479	-.447
Q41. The use of Quizlet is useful to interact with my classmates.	-.346	-.235
Q42. The use of Quizlet is useful to interact with my teacher.	-.519	-.479
Q43. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining.	-.529	-.248
Q44. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning less stressful.	-.893	1.243
Q45. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more comfortable.	-.864	1.039
Q46. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	-.560	-.377
Q47. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more creative.	-.383	-.843
Q48. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective.	-.498	-.559
Q49. The advantage of using Quizlet overweighs the disadvantages of using it.	-.218	-.785
Q50. Quizlet helped me be more active in learning English	-.598	-.204
Q51. It was inconvenient to learn English through Quizlet, so it was more comfortable for the teacher to teach me in class.	-.408	-.188

Q52. The Quizlet website and/or mobile app was clear and	-.346	-.465
Q53. For me, it is easy to learn English vocabulary through Quizlet.	-.145	-.544
Q54. For me, it is easy to learn English receptive vocabulary knowledge through Quizlet.	-.500	.483
Q55. For me, it is easy to learn English productive vocabulary knowledge through Quizlet.	.060	-.980
Q56. For me, it is easy to become skillful in using Quizlet.	-.717	.368
Q57. For me, it is easy to use Quizlet.	-.626	.563
Q58. I want to learn English vocabulary with Quizlet in the future.	-.659	.545
Q59. I want to learn English receptive vocabulary knowledge with Quizlet in the future.	-.692	1.019
Q60. I want to learn English productive vocabulary knowledge with Quizlet in the future.	-.692	1.019
Q61. I will return to Using Quizlet often.	-.281	-.750
Q62. I am going to positively utilize Quizlet to learn English	-.467	-.488
Q63. I will add Quizlet as another medium to learn English.	.000	-1.171
Q64. Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.	-.322	-.792

Appendix F：Week 1 to Week 4 Activities for Quizlet Instruction

Week 1

Week 1 First Lesson:

1.The teacher explained how to create a Quizlet account step by step via slides.

2.The teacher created an online class on Quizlet and sent the link to students via QQ group (a social media widely used by students in China).

3.Students clicked the link and started creating their own Quizlet account.

4. Students were required to use their QQ email address to create an account as an easy password recovery.

5. The teacher instantly provided students with help if they had problems creating their Quizlet account.

6.After students have created their own Quizlet account, have them join the Quizlet class.

Week 1 Second Lesson:

1. The teacher uploaded the Unit 1 Part 2 vocabulary list to Quizlet.

2. The teacher sent the link to students and showed the Unit 1 Part 2 flashcards on Quizlet using multimedia (projectors).

3. Students were given 5 minutes to study the flashcards on Quizlet at their own pace.

4. Students were given 5 minutes to read the target words on Quizlet loudly by listening to the sounds of the flashcards.

5. The teacher instructed students to categorize the target words they want to practice more individually after class (choose the star mark on the flashcard, which would be categorized into star-filled words).

Week 2

Week 2 First Lesson:

1. Using flashcards, Students were given 5 minutes to study the star-filled words from Unit 1, part 2. If some students do not know how to do this, the teacher instructs students individually (click the options button and select only study the star-filled words, then click "restart flashcard module," the words presented on the flashcard only star-filled words).

2. After explaining the Unit 1 Part 3 words, students were given 10 minutes to

practice the target words on Quizlet through the ‘study’ module.

3. Then, the teacher instructed the students to click the “option” button on the top right corner of the interface and then select the question type of words to study.

4. Students would be given 5 minutes to practice the target words on the study module using the question types they selected.

Week 2 Second Lesson:

1. Students were given 5 minutes to review the target words from Unit 1, part 3, using the “study” module on Quizlet.

2. After explaining the target words of Unit 1, part 4, students were instructed to practice the target words using the "write" module on Quizlet and were given 10 minutes to practice.

3. Explained and solved problems students encountered while practicing words on Quizlet.

4. The teacher gave students after-class assignments to practice target words of unit 1 part 4 via flashcard module, study module, and write module.

Week 3

Week 3 First Lesson:

1. Students were given 7 minutes to complete the Unit 1 part 4 target words assessment via the “Test” module on Quizlet.

2. The teacher instructed students on how to select the test question type on Quizlet (click the options button in the upper right corner of the interface, then select the question types and click “create a new test”).

3. After explaining the target words of Unit 2 Part 1, students were given 5 minutes to practice the target words using the Matching module on Quizlet.

4. The teacher instructed students on how to create new Quizlet word sets by students themselves (click the “+” button at the top right corner of the interface, and then select “create new word set”, and then enter the word set creation interface, instruct students to name the word set, select the language of the target word and the native language, and enter the target word by hand or can be entered by word or Excel file, and instruct students to select pictures related to the target word).

5. Teacher asked students to create the Unit 2 Part 2 word set by themselves after class.

Week 3 Second Lesson:

1. The teacher checked if students had created their word set on Quizlet.

2. After explaining the target words of Unit 2, part 2, students were given 15 minutes to practice the target words on Quizlet.

3. Students were required to finish practice words by trying to finish the word

practice through the “Flashcard”, “Study”, “Math”, and “Test” module within 15 minutes.

4. The students were required to finish the assignment after class and practice the target words of Unit 2, part 2, on Quizlet.

Week 4

Week 4 First Lesson:

1. Students were given 5 minutes to do the Unit 2 part 2 words practice by test module on Quizlet.

2. After explaining the new words of Unit 2, part 3, students were given 15 minutes to practice new words on Quizlet.

3. The students were required to practice the new words of Unit 2, part 3, on Quizlet at least once more.

Week 4 Second Lesson:

The pretests were conducted in the second lesson of week 4.

Appendix G：Quizlet Intervention Vocabulary Learning (Lesson Plan)

Theme	(E.g., Travel)		
Date		**Day**	
Time		**Duration**	
Class	Year 1	**Number of students**	95
Objectives	By the end of the lesson, students should have mastered the spelling and pronunciation of words and phrases and be able to read and write the target words correctly, especially those related to planning and describing a trip.		
Educational Emphases	Mastery Learning: Quizlet is used to ensure that students master the words. Knowledge acquisition: Students will learn words related to travel. Values and citizenship: Helping each other. Assessment: Students complete the "test" module on Quizlet to assess their vocabulary acquisition.		
Teaching Aids	Pointer, Quizlet website, multimedia teaching facility		
Stages	**Content/Teaching Activities**	**Teaching and Learning Activities**	**Notes/Remarks**
Set Induction (±5 minutes)	Divide the students into groups to brainstorm the vocabulary, phrases, and scenes that are relevant to planning and describing a trip and asking about a place of interest.	1. The teacher greets the class and writes the topic of the lesson on the board. 2. Teacher shows slides with pictures about traveling. 3. Teacher asks students to discuss words and expressions about traveling with group members. 4.Teacher asks students to tell the words and expressions they discussed.	**Teaching Aids:** Slides Pointer **Educational Emphases:** Read and spell words
Presentation	**Whole class activities:** 1. Come up with the	**Whole class activities:** 1. Teacher shows how	**Teaching Aids:**

(± 45 minutes)	target words. 2. Explain the meaning and usage of the target words with example sentences. 3. Read the target words from the Quizlet flashcards. 4. Spell the target words with pen and paper. 5. Practice the target words on Quizlet. 6. Learn dialogues using target words. 7. Recite dialogues	many target words would be learned in this lesson. 2. Teacher explains the meaning and usage of each target word with example sentences on slides. 3.Teacher asks students to read the target words three times following the Quizlet flashcard sounds. 4. Students are required to write the target words two times for each word. 5.Students are required to practice the target words on Quizlet and each of the modules must be used at least once and at the end of the practice students are required to complete the "Test" module. 6. Learn dialogues about traveling with the target words. 7. Students read and recite the dialogues.	Pointer Slides Quizlet website **Educational Emphasis:** Read and spell words. Recite dialogues.

Appendix H Skewness and Kurtosis Scores of Variables of Actual Study Questionnaire

Construct	Items	Skewness	Kurtosis
Actual usage	1. After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.	-0.47	-0.069
	2. I believe that using Quizlet can improve my English vocabulary knowledge.	-0.367	-0.881
	3. I believe that using Quizlet can improve my English language competency.	-0.164	-0.87
	4. I believe that using Quizlet can increase my English receptive vocabulary knowledge.	-0.198	-0.778
	5. I believe that using Quizlet can increase my English productive vocabulary knowledge.	-0.216	-0.866
Usefulness	1. Quizlet helped me learn English vocabulary more quickly.	-0.277	-0.992
	2. My Receptive vocabulary knowledge was improved by using Quizlet.	-0.452	-0.145
	3. My Productive vocabulary knowledge was improved by using Quizlet.	-0.22	-0.81
	4. The use of Quizlet helped me to improve my reading skills.	-0.125	-0.56
	5. The use of Quizlet helped me to improve my writing skills.	-0.218	-0.04
	6. The use of Quizlet helped me to improve my speaking skills.	-0.055	-0.295
	7. The use of Quizlet helped me to improve my listening skills.	-0.162	-0.039
	1. I have a generally favorable attitude towards using Quizlet learning English vocabulary.	-1.241	2.459
	2. I would like to use Quizlet learning English receptive vocabulary knowledge.	-0.48	-0.193

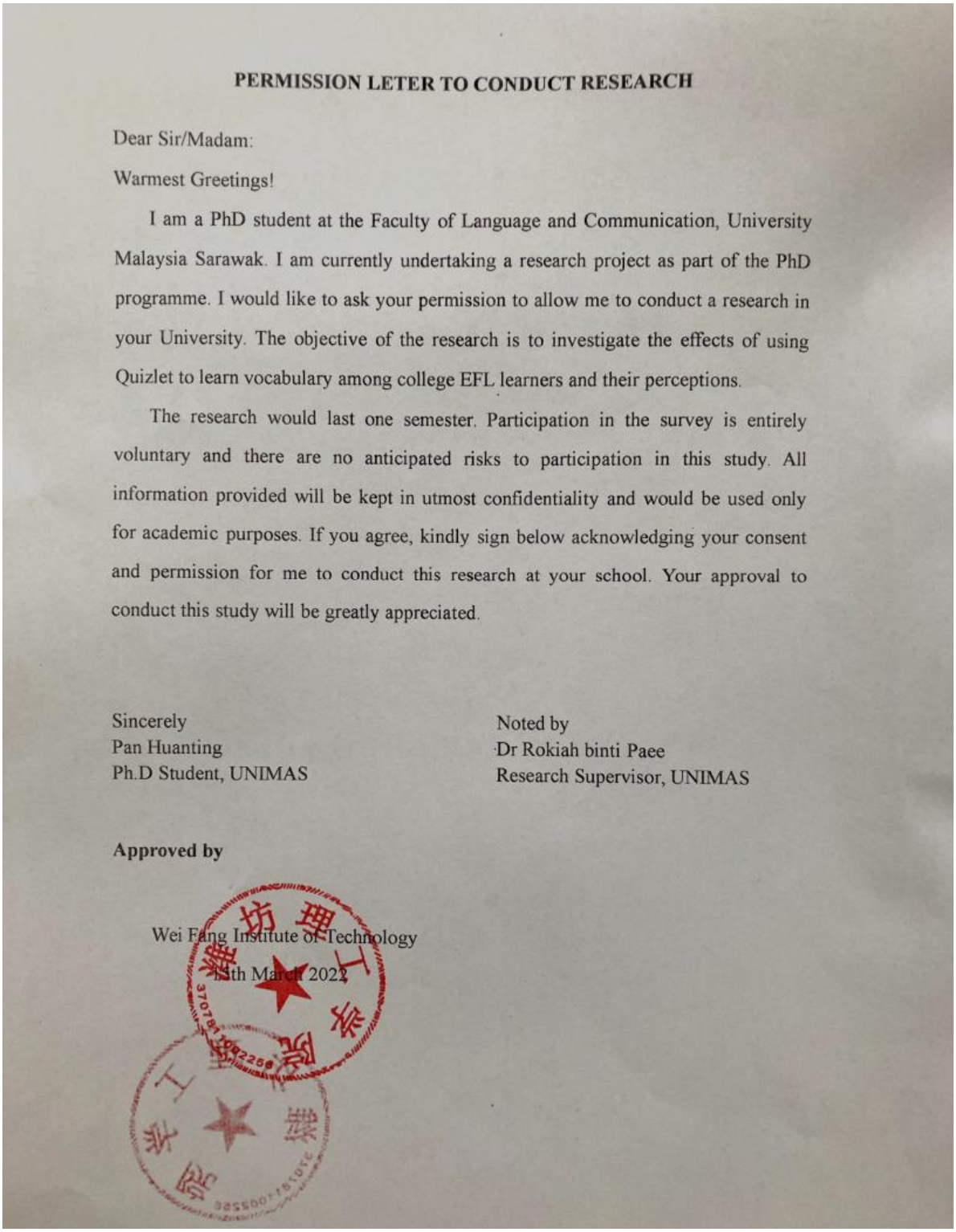
	3. I would like to use Quizlet learning English productive vocabulary knowledge.	-0.429	-0.564
Attitude	4. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining.	-0.529	-0.248
	5. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	-0.56	-0.377
	6. When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more effective.	-0.498	-0.559
	7. The advantage of using Quizlet overweighs the disadvantages of using it.	-0.218	-0.785
	1. The Quizlet website and/or mobile app was clear and understandable.	-0.346	-0.465
	2. For me, it is easy to learn English vocabulary through Quizlet.	-0.145	-0.544
Ease of use	3. For me, it is easy to learn English receptive vocabulary knowledge through Quizlet.	-0.5	0.483
	4. For me, it is easy to learn English productive vocabulary knowledge through Quizlet.	0.06	-0.98
	5. For me, it is easy to become skillful in using Quizlet.	-0.717	0.368
	6. For me, it is easy to use Quizlet.	-0.626	0.563
	1. I want to learn English vocabulary with Quizlet in the future.	-0.659	0.545
	2. I want to learn English receptive vocabulary knowledge with Quizlet in the future.	-0.692	1.019
Behavioral intention	3. I want to learn English productive vocabulary knowledge with Quizlet in the future.	-0.692	1.019
	4. I will use Quizlet often.	-0.281	-0.75
	5. I am going to positively utilize Quizlet to learn English vocabulary.	-0.467	-0.488
	6. I will add Quizlet as another medium to learn English.	0	-1.171

7. Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.	-0.322	-0.792

Appendix I Sample Thematic Coding Process

Evidence/ original response (from the transcription; excerpts from transcriptions)	Initial Coding	Sub-themes	themes
Yes, listening skills will also be improved, because Quizlet has pronunciation practice, we play it in the listening practice is the official pronunciation, and then the pronunciation on Quizlet is also the official pronunciation, they are similar, so it is easier to understand.	The sound feature on Quizlet is beneficial to learners' listening skills.	Improve listening skill	Useful
It's quick to be familiar, as all the features marked on the interface. There are no mess things. Watching the interface, you know what you want to do next. It's pretty good.	The user interface is very clear and easy to use.	User friendly	Ease of use
I always do it in my spare time when I have nothing to do. When I get up in the morning, when I brush my teeth, or when I have a meal, or after class, and then sometimes I just have nothing to do, I open Quizlet. Well, if you want to memorize a word, you can open it and you don't have to carry around a big book of vocabulary.	Quizlet can be used in a fraction of the time and is conveniently portable.	Like Quizlet	Positive attitude
Quizlet will be used in the future because I can create word sets on Quizlet by myself, and I think it will still be used in the future. I've used a vocabulary learning app before, *Baicizhan*, and I think Quizlet has more features. Learning words with Quizlet is not so boring.	Would like to use Quizlet in the future as it allows users to create their own word sets.	Would like to use in the future	Behavior intention

Appendix J Consent Form of Institution



PERMISSION LETER TO CONDUCT RESEARCH

Dear Sir/Madam:

Warmest Greetings!

I am a PhD student at the Faculty of Language and Communication, University Malaysia Sarawak. I am currently undertaking a research project as part of the PhD programme. I would like to ask your permission to allow me to conduct a research in your University. The objective of the research is to investigate the effects of using Quizlet to learn vocabulary among college EFL learners and their perceptions.

The research would last one semester. Participation in the survey is entirely voluntary and there are no anticipated risks to participation in this study. All information provided will be kept in utmost confidentiality and would be used only for academic purposes. If you agree, kindly sign below acknowledging your consent and permission for me to conduct this research at your school. Your approval to conduct this study will be greatly appreciated.

Sincerely
Pan Huanting
Ph.D Student, UNIMAS

Noted by
Dr Rokiah binti Paee
Research Supervisor, UNIMAS

Approved by

Wei Fang Institute of Technology
15th March 2022

研究实施许可书（In Chinese）

尊敬的领导：

您好！我是马来西亚砂拉越大学语言与交流学院的在读博士生，目前正在进行一个研究项目作为我的博士课题。我想征求您的许可，允许我在您的大学进行研究。本研究的目的是调查大学英语学习者对使用 Quizlet 进行词汇学习的效果，以及学习者对 Quizlet 的看法。

本研究将持续一个学期。参与本研究的学生完全自愿，参与本研究没有风险。研究中学生提供的所有资料将会严格保密，只作学术用途。如果您同意，请在下面签字，表示您同意并允许我在贵校进行这项研究。

非常感谢您批准进行这项研究。

学生：潘焕亭
马来西亚砂拉越大学博士生

导师：Rokiah binti Paee 博士
马来西亚砂拉越大学博士研究生导师

同意开展研究

潍坊理工学院

2022 年 3 月 15 日

Appendix K Consent Form of Participants

Consent Letter to Students

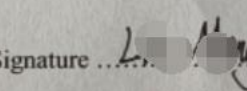
Dear Students,

I am a PhD student at the Faculty of Language and Communication, University Malaysia Sarawak. I am currently undertaking a research project as part of the PhD programme. The objective of the research is to investigate the effects of using Quizlet to learn vocabulary among college EFL learners and their perceptions.

I would like to invite you to participate in this study in order to help me collect data. Your careful completion of the survey, test and interview will contribute greatly to obtaining real data, which is crucial for more accurate findings. The study does not pose any psychological or physical harm to the participants.

I guarantee that your name and identity information that you will provide will be strictly confidential and will not be used anywhere. If you have any questions about the study, please feel free to contact the researcher, Pan Huanting (E-mail: pan200538@qq.com, H/P: 17863689608). If you agree to participate in this study, please sign your name below.

Thank you for your assistance and cooperation.

Consent Form
I have read and understood the information provided about this research project. I approve to participate in the study. Your Signature .....  Date 2022.3.20.....

致学生的同意书（In Chinese）

亲爱的同学们：

您好！我是马来西亚砂拉越大学语言与交流学院的一名在读博士生。我目前在进行一项研究作为我的博士课题。本研究的目的是调查大学英语学习者使用 Quizlet 学习英语词汇的效果以及学习者对 Quizlet 的看法。

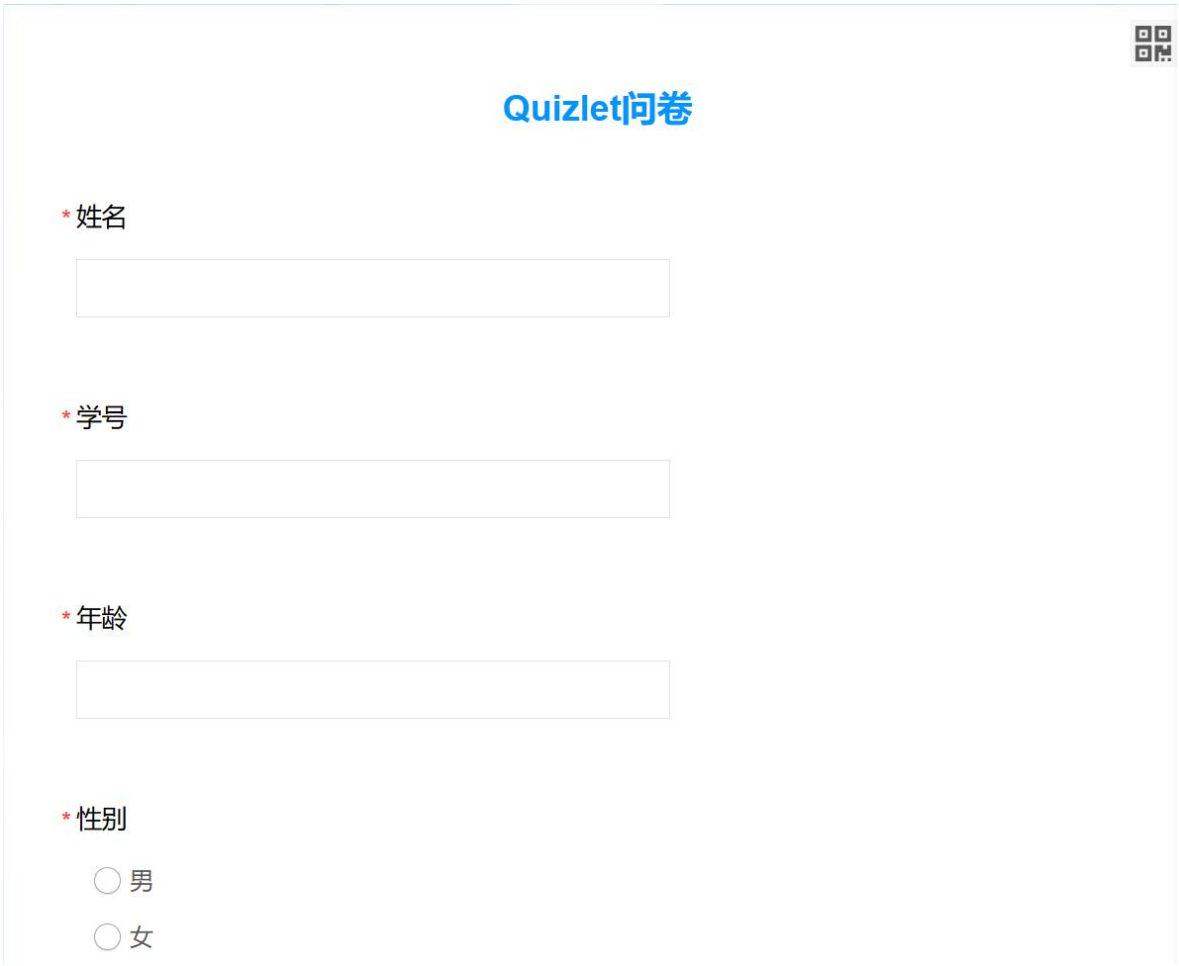
我真诚邀请您参加这项研究以完成数据收集工作。我诚恳邀您认真完成调查问卷、测试和访谈，这对于我获得真实的数据和准确的结果至关重要。本研究将不会对您造成任何心理或身体上的伤害。

本人承诺将严格保密您的姓名和身份信息，不会用到与本研究无关的其他任何地方。如果您对本次研究有任何疑问，请联系潘焕亭（E-mail: pan200538@qq.com, H/P: 17863689608）。如果您愿意参加该项研究，请在如下的同意书上签字。

非常感谢您的协助与合作！

同意书
我已经阅读并理解了关于这个研究项目提供的信息。 我同意参加这项研究。 学生签名 刘[redacted]雨 日期 2022.3.20

Appendix L Web-based Questionnaire for Actual Study



Quizlet问卷

* 姓名

* 学号

* 年龄

* 性别

男

女

* 学习英语多少年了?

* 1-1.每周我完成Quizlet上的词汇练习作业后，还会使用Quizlet学习英语词汇。

非常不同意 非常同意

* 1-2.我认为使用Quizlet可以提升我的英语词汇知识。

非常不同意 非常同意

* 1-3.我认为使用Quizlet可以提升我的英语语言能力。

非常不同意 非常同意

* 1-4.我认为使用Quizlet可以增加我的英语接受性词汇知识。

非常不同意 非常同意

* 1-5.我认为使用Quizlet可以增加我的英语产出性词汇知识。

非常不同意 非常同意

* 2-1.Quizlet帮助我更快的学习英语词汇。

非常不同意 非常同意

* 2-2.通过使用Quizlet我的英语接受性词汇知识增加了。

非常不同意 非常同意

* 2-3.通过使用Quizlet我的英语产出性词汇知识增加了。

非常不同意 非常同意

* 2-4.Quizlet的使用帮我提升了阅读技能。

很不满意 很满意

* 2-5.Quizlet的使用帮我提升了英语写作技能。

非常不同意 非常同意

* 2-6.Quizlet的使用帮我提升了英语口语技能。

非常不同意 非常同意

* 2-7.Quizlet的使用帮我提升了英语听力技能。

非常不同意 非常同意

* 3-1.我对使用Quizlet学习英语词汇持积极态度。

非常不同意 非常同意

* 3-2.我喜欢使用Quizlet学习英语接受性词汇知识。

非常不同意 非常同意

* 3-3.我喜欢使用Quizlet学习英语产出性词汇知识。

非常不同意 非常同意

* 3-4.与传统的课堂词汇学习相比，Quizlet的使用让我的词汇学习更加有趣。

非常不同意 非常同意

* 3-5.与传统的课堂词汇学习相比，Quizlet的使用让我的词汇学习更加多样化。

非常不同意 非常同意

* 3-6.与传统的课堂词汇学习相比，Quizlet的使用让我的词汇学习更具创新性。

非常不同意 非常同意

* 3-7.使用Quizlet的优点大于缺点。

非常不同意 非常同意

* 4-1.Quizlet的网页版或手机应用程序清晰易懂。

非常不同意 非常同意

* 4-2.对我来说，通过Quizlet学习英语词汇很容易。

非常不同意 非常同意

* 4-3.对于我来说，通过Quizlet学习英语接受性词汇知识很容易。

非常不同意 非常同意

* 4-4.对我来说，通过Quizlet学习英语生产性词汇知识很容易。

非常不同意 非常同意

* 4-5.对我来说，使用Quizlet很容易。

非常不同意 非常同意

* 5-1.以后我想用Quizlet来学习英语词汇。

非常不同意 非常同意

* 5-2.我想以后用Quizlet学习英语接受性词汇知识。

非常不同意 非常同意

* 5-3.我想以后用Quizlet学习英语产出性词汇知识。

非常不同意 非常同意

* 5-4.我将经常使用Quizlet。

非常不同意 非常同意

* 5-5.我要积极利用Quizlet来学习英语词汇。

非常不同意 非常同意

* 5-6.我将添加Quizlet作为另一种学习英语的工具。

非常不同意 非常同意

* 5-7.Quizlet帮助我学习了大学英语词汇，所以我想即使本学期大学英语课程结束后，使用Quizlet学习也会很好。

非常不同意 非常同意

Appendix M Non-web-based Questionnaire for Actual Study in English

Please circle a number from 1 to 5 that best expresses how much you agree or disagree with the following statements. Please do not leave any item empty.

1 = Strongly Disagree

2 =Disagree

3 =Neutral

4 =Agree

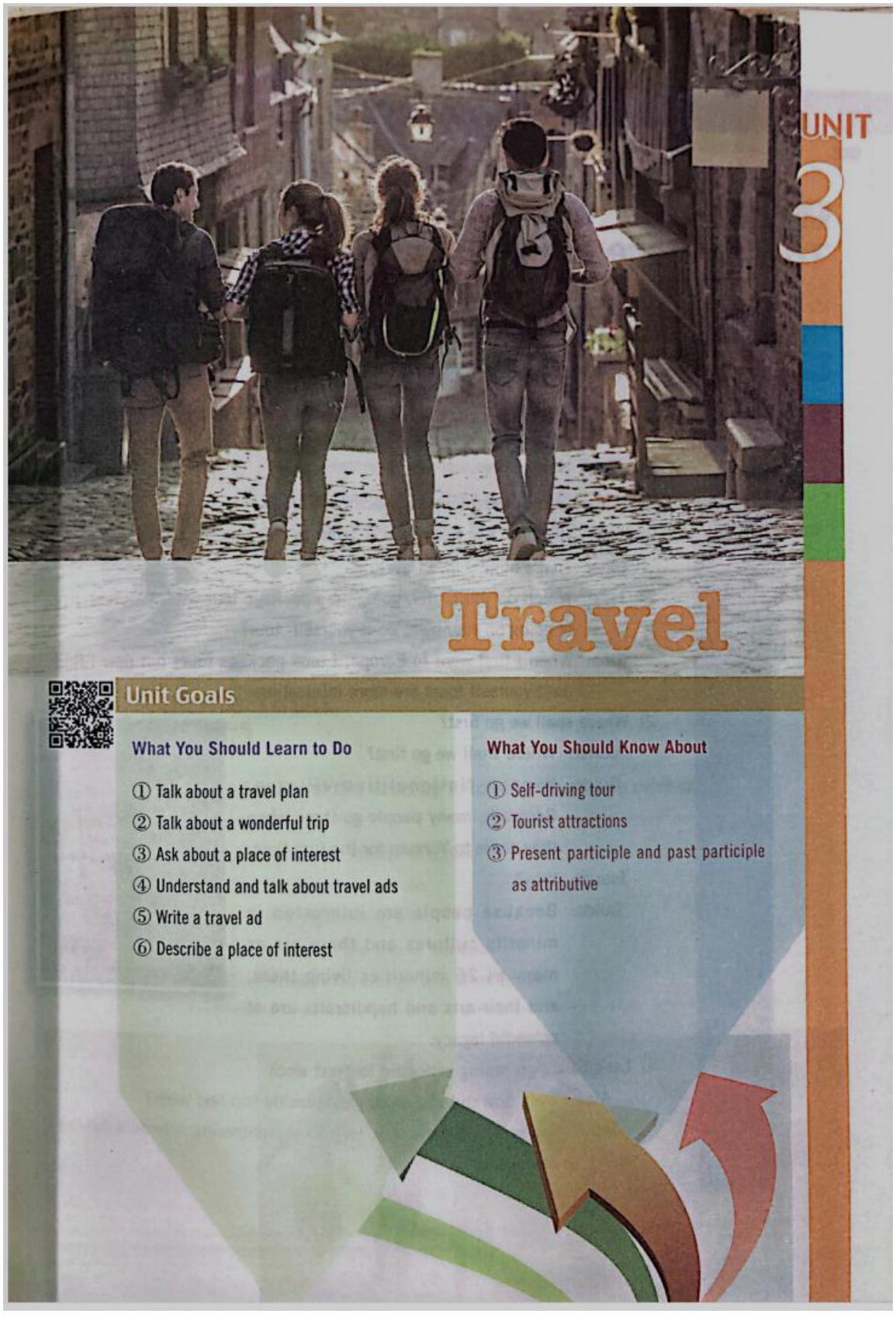
5 =Strong agree

NO.	Items	Five Likert scale				
1-1	After finishing the vocabulary practice assignment on Quizlet, I also use Quizlet to learn vocabulary every week.	1	2	3	4	5
1-2	3. I believe that using Quizlet can improve my English vocabulary knowledge.	1	2	3	4	5
1-3	I believe that using Quizlet can improve my English language competency.	1	2	3	4	5
1-4	I believe that using Quizlet can increase my English receptive vocabulary knowledge.	1	2	3	4	5
1-5	I believe that using Quizlet can increase my English productive vocabulary knowledge.	1	2	3	4	5
2-1	Quizlet helped me learn English vocabulary more quickly.	1	2	3	4	5

2-2	My Receptive vocabulary knowledge was improved by using Quizlet.	1	2	3	4	5
2-3	My Productive vocabulary knowledge was improved by using Quizlet.	1	2	3	4	5
2-4	The use of Quizlet helped me to improve my reading skills.	1	2	3	4	5
2-5	The use of Quizlet helped me to improve my writing skills.	1	2	3	4	5
2-6	The use of Quizlet helped me to improve my speaking skills.	1	2	3	4	5
2-7	The use of Quizlet helped me to improve my listening skills.	1	2	3	4	5
3-1	I have a generally favorable attitude towards using Quizlet learning English vocabulary.	1	2	3	4	5
3-2	I would like to use Quizlet learning English receptive vocabulary knowledge.	1	2	3	4	5
3-3	I would like to use Quizlet learning English productive vocabulary knowledge.	1	2	3	4	5
3-4	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more entertaining.	1	2	3	4	5
3-5	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more diverse.	1	2	3	4	5
3-6	When compared to traditional classroom vocabulary learning, the use of Quizlet made my vocabulary learning more creative.	1	2	3	4	5
3-7	The advantage of using Quizlet overweighs the disadvantages of using it.	1	2	3	4	5

4-1	The Quizlet website and/or mobile app was clear and understandable.	1	2	3	4	5
4-2	For me, it is easy to learn English vocabulary through Quizlet.	1	2	3	4	5
4-3	For me, it is easy to learn English receptive vocabulary knowledge through Quizlet.	1	2	3	4	5
4-4	For me, it is easy to learn English productive vocabulary knowledge through Quizlet.	1	2	3	4	5
4-5	For me, it is easy to use Quizlet.	1	2	3	4	5
5-1	I want to learn English vocabulary with Quizlet in the future.	1	2	3	4	5
5-2	I want to learn English receptive vocabulary knowledge with Quizlet in the future.	1	2	3	4	5
5-3	I want to learn English productive vocabulary knowledge with Quizlet in the future.	1	2	3	4	5
5-4	I will use Quizlet often.	1	2	3	4	5
5-5	I am going to positively utilize Quizlet to learn English vocabulary.	1	2	3	4	5
5-6	I will add Quizlet as another medium to learn English.	1	2	3	4	5
5-7	Quizlet helped me study College English vocabulary, so I think it would be good to use Quizlet even after finishing college English course in the future.	1	2	3	4	5

Appendix N Excerpts of Unit 3 of the Textbook



Section ①

Talking Face to Face

Imitating Mini-Talks

Speak and Recite

❶ **Work in pairs. Look at the picture and recite the following mini-talks for sightseeing.**

Window on Key Words

1) I heard you've been to many places in Europe.

Jack: Hi, Gina! I've heard you've been to many places in Europe?

Gina: That's right. I love traveling.

Jack: Which do you prefer, going on a package tour with a tour agency or going on your own, do-it-yourself- tour?

Gina: When I first went to Europe, I took package tours but now I find do-it-yourself tours are more interesting.

2) Where shall we go first?



Tourist: Where shall we go first?

Guide: Yunnan Nationalities Villages. Generally, many people go there when they come to Yunnan for the first time.

Tourist: Why?

Guide: Because people are interested in minority cultures and there are as many as 26 minorities living there, and their arts and handicrafts are of splendid legacy.

3) Let's fix a sightseeing schedule for next week.

Alex: Well, how did you enjoy your seaside trip last week?

Belly: It was fun. By the way, let's fix a sightseeing schedule for the next week.

Alex: Would you like to join a conducted tour of the city?

Belly: No. I'd rather have a visit by myself.

4) Where did you go for your summer vacation?

John: Where did you go for your summer vacation?

Mary: I went to San Francisco with a few friends.

John: That sounds like fun. How long did you stay there?

Mary: Just one week.

5) Have you ever been to Paris?

Helen: Have you ever been to Paris?

Tom: Yes. There're so many places of interest to visit.

Helen: Oh, I've heard about them. I plan to see the Louvre and the Eiffel Tower.

Tom: I don't think one day is enough to see much of the city.

Acting Out the Tasks

Speak and Perform

❷ **Work in pairs and perform the tasks by following the above mini-talks.**

TASK

1) Choose the means of travel.
2) Introduce a schedule.
3) Fix a sightseeing plan.
4) Talk about the trip to London.
5) Discuss where to go and what to see.



Studying Travel Ads

Study and Imitate

❸ **Travel advertisements are always with us. They provide useful information for people to know where to go. Read the following ad and try to use the information in your face-to-face talks.**

Sample

The Great Wall

Natural Features

The Great Wall rises and falls with the contours of the mountains westward, crossing several provinces, municipalities and autonomous regions for 6 700 kilometers.

Purpose of Construction

As one of the most magnificent ancient defense works, the Great Wall is known as one of the wonders of the world.

Highlights Built

Beacon towers were also built at fixed intervals for passing on military information. All these indicate the important role of the Great Wall in military defense.

Following Sample Dialogues

Imitate and Perform

❹ **Read the following sample dialogues and try to perform your own tasks.**

What a significant scenic spot it is!

Mr. Ahrens: Look, the Great Wall! It is really amazing!

Miss Zhang: I have known about it since I was a child, and I've finally come to see it in person.

Mr. Ahrens: I wonder why the ancient Chinese people built the Great Wall.

Miss Zhang: It was a military defense, and it is a man-made wonder, one of the Eight Wonders of the World.

Mr. Ahrens: It was said that the Great Wall was first built by the First Emperor of Qin Dynasty, right?

Miss Zhang: Not really. The construction began from the Warring States period about

2 500 years ago.

Mr. Ahrens: What's the length of the Great Wall?

Miss Zhang: The Great Wall is about 6 700 kilometers from east to west.

Mr. Ahrens: What were those separate towers used for?

Miss Zhang: They were beacon towers used in ancient time mainly for communication by fire signals.

Mr. Ahrens: That's very impressive.

It Was Really a Wonderful Trip.

(Julia had a wonderful trip to Paris and London. Peter is asking about her impressions of the two cities.)

Peter: So it was really a wonderful trip. Which city did you like better, Paris or London?

Julia: That's hard to say. There were both good things and bad things about the two cities.

Peter: Wait a minute! What are the bad things?

Julia: Traffic, for one. The traffic in Paris was pretty bad, and the traffic in London was even worse.

Peter: That's true. All big cities have bad traffic.

Julia: Well, forget it. Let's talk about the good things.

Peter: OK.

Julia: The art galleries in Paris were fantastic. And the Louvre was amazing.

Peter: I love the galleries in London, but I like the ones in Paris even more.

Putting Language to Use

Speak and Complete

Imagine you are Wang Na. You want to know about the local attractions in Shanghai. Fill in the blanks according to the Chinese provided.

Receptionist: Good afternoon. Can I help you?

Wang Na: Good afternoon. I _____. (这是我第一次来这里度假。) I am wondering where I should go and see.

Receptionist: Well. You can go to Lujiazui to see some buildings that represent modern Shanghai, like the Pearl Tower or Jinmao Tower.

Wang Na: Sounds great. 2 _____? (还有什么其他推荐的吗？)

Receptionist: You can also go to Xujiahui that represents old Shanghai, where you can find many famous roads. One you should visit in particular is Wukang Road, 3 _____.(它有始建于20世纪20年代和30年代早期的伟大传统建筑。)

Wang Na: 4 _____? (你觉得那儿会有很多人吗？)

Receptionist: On the weekdays, there are not so many people around. It is rather quiet actually.

Wang Na: 5 _____. (非常感谢你的建议。) By the way, where can I find typical Shanghai cuisine?

Receptionist: I would definitely recommend Yuanyuan Restaurant which is not far from here. 6 _____. (他们有传统的上海菜。) But I am afraid that 7 _____. (这家餐馆很受欢迎，晚餐时间可能是订满的)

Wang Na: I am drooling already. Thank you.

Speak and Communicate

6 **Imagine you are Selena and you are talking with Linda about your trip to Beijing in the summer vacation. Play your role according to the clues given in brackets.**

Selena: 1 (告诉Linda你这个暑假要去北京旅游。)

Linda: Really? That's wonderful. Beijing is an ancient city and a great place for sightseeing.

Selena: 2 (问她是否去过北京，这座古城有哪些地方可以游览。)

Linda: Yes, I taught English in Beijing for one year. In Beijing, there are so many beautiful places to see. The Forbidden City should be your first choice.

Selena: Oh, I see. 3 (告诉她你计划先去游览故宫，然后再去颐和园，还有天坛。)

Linda: You shouldn't forget about the Great Wall.

Selena: Certainly. 4 (表示登长城一直是梦寐以求的事情。)
Linda: How long will you stay there?
Selena: 5 (说你要待上一周时间。)

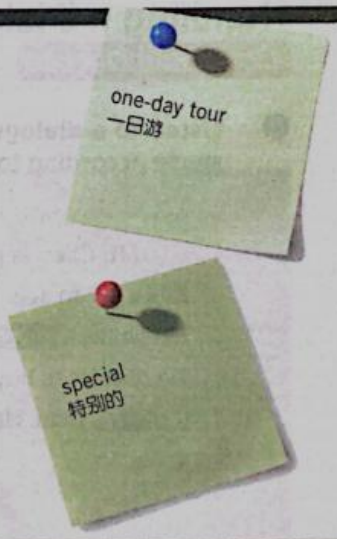
Section II
Being All Ears

Learning Sentences for Workplace Communication

Listen and Repeat

❶ **Listen to ten topic-related sentences for workplace communication and try to remember them.**

1) Can you introduce some of your tours to me?
2) The tour that goes to Shanghai leaves every other day.
3) Excuse me. Could you tell me where the tourist information center is?
4) Do you have a sightseeing brochure for the city?
5) How much is the Shangri-La tour for 7 days?
6) Where are you going for your summer holiday?
7) How long will you stay there?
8) Do you have a **one-day tour**?
9) Is there anything **special** you want to see?
10) The trip is about five and a half hours long.



Listen and Match

❷ **Listen again to the above sentences rearranged in sequence, and then match them with their Chinese translation.**

1) _____ a. 暑假你打算去哪儿?
2) _____ b. 香格里拉 7 日游多少钱?
3) _____ c. 你有这座城市的旅游手册吗?
4) _____ d. 你们有一日游的团吗?
5) _____ e. 打扰一下，你能告诉我旅游咨询处在哪儿吗?
6) _____ f. 到上海的旅行每隔一天发团一次。
7) _____ g. 你有特别想去看看的地方吗?
8) _____ h. 这次旅行大约需要五个半小时。
9) _____ i. 你能给我推荐一些你们的旅行线路吗？
10) _____ j. 你会在那里待多久?

Handling a Dialogue

Listen and Decode

❸ **Listen to a dialogue and decode the message by finding the correct choices in shade according to what you have heard.**

Mr. Chen is going to visit Shenyang with his friend. Shenyang is a big city and has a lot to see. He wants to travel on 1 (February, June, January) 1st, so he goes to Sunshine, a 2 (ticket station, travel agency, book shop) to purchase 3 (air, railway, sea) tickets. He decides to buy two 4 (economy, business, first) class tickets. They will cost him 5 (2029, 1029, 129) yuan. He pays 1050 yuan in 6 (cash, credit card, money) and gets his change, 21 yuan.

Understanding a Short Speech / Talk

Listen and Complete

Listen to an announcement twice and during the second listening, put back the missing words in the blanks.

Ladies and gentlemen, the captain has turned on the Fasten Seat Belt sign. Please take your 1 _____ and fasten your seat belt.

At this time, we request that all cell phones be turned off for the 2 _____ duration of the flight. We request that all other 3 _____ devices be turned off until we fly above 10 000 feet. We will notify you when it is _____ to use such devices.

4 We 5 _____ you that this is a non-smoking flight. Smoking is not 6 _____ _____ on the entire aircraft, including the lavatories.

If you have any 7 _____ during our flight today, please don't 8 _____ ____ to ask one of our flight attendants. Thank you.

After-Class Activity

iSmart has more.



Section III

Trying Your Hand

Practicing Applied Writing

Write and Simulate

❶ **Read the following sample of travel instruction and learn to write your own.**

Sample

The Best of China Tour

4 DAYS & 3 NIGHTS——Beijing

Day 1 Arrival

Welcome to Beijing, the capital of China. On arrival, you will be met by our CITS guide and transferred to your hotel. Dinner will be served in the hotel as well as the breakfast in the following three days.

Day 2 City Tour

Morning tour to Tiananmen Square, located in the heart of the capital, and the Forbidden City — one of the greatest feasts of ancient Chinese architecture. Afternoon sightseeing includes Summer Palace — a former summer resort area of the royal family, and a visit to the Temple of Heaven, where the emperors prayed for good harvests. Enjoy the famous Beijing roast duck in the evening.

Day 3 Suburb Tour

Full day excursion to the Great Wall — the landmark of China. It is one of the most amazing feasts of man-made construction on earth visible from outer space. After lunch, a drive to the Ming Tombs, along the way with giant marble figures and animals guarding the tomb area for deceased emperors of the Ming Dynasty. Beijing Opera or acrobatic performance will be attended in the evening.

Day 4 Departure

Your journey comes to an end this morning as you board an express train for Hong Kong.

Write and Match

❷ **Match the English expressions in Column A with the Chinese equivalents in Column B.**

A	B
1) the capital of China	a. 中国国际旅行社
2) CITS	b. 明十三陵
3) Tiananmen Square	c. 紫禁城
4) the Forbidden City	d. 天坛
5) the royal family	e. 天安门广场
6) the Temple of Heaven	f. 中国的首都
7) the landmark of China	g. 京剧
8) Beijing Opera	h. 杂技表演
9) acrobatic performance	i. 中国的地标
10) the Ming Tombs	j. 皇家

Read and Find

❸ **Read the following travel ad and find out the details below.**

Come to Canada

Canada is a friendly country that is close to home. You'll arrive as a tourist, but you'll leave as a friend. Ski on our snowy mountaintops and swim in our clear blue lakes. Enjoy the clean air of the country and the excitement of our cities.

For more information, call your travel agent or Holiday, Inc. (800-324-4839)



The country to visit:
Attitude towards tourists:
Activities arranged:
Contact:

Writing Sentences and Reviewing Grammar

Window on Grammar



Present Participle and Past Participle as Attributive

分词有现在分词和过去分词两种形式,可以在句中作定语或状语。分词单独作定语时可放在所修饰的名词之前或之后；分词短语作定语则需放在它所修饰的名词之后。试比较:

现在分词单独作定语:修饰的是发出该动作的名词

I've just read a fascinating book on the history of the stock exchange.

我刚读了一本引人入胜的介绍证券交易史的书。

过去分词作定语:修饰的是承受该动作的名词

The population is aging in some of the industrialized countries.

在一些工业化国家人口正在老化。

现在分词短语作定语:

The road joining the two towns was built last year.

连接两镇的道路是去年建造的。

过去分词短语作定语:

Our house, shaded completely by old trees, stays cool in summer.

我们家的房子完全被老树遮挡着，夏天很凉快。

Write and Apply Rules

❹ **Find the correct choices in brackets to complete the sentences.**

1) There are a lot of fans _____ (hoped, hoping) for a glimpse of the movie star.
2) The tourist _____ (looking at, looked at) the map is a relative of my father.
3) People _____ (lived, living) in cities can enjoy more of modern life.
4) Here is a notice _____ (warned, warning) people not to litter the beach.
5) Computers _____ (imported, importing) from abroad are usually more expensive.
6) People _____ (wishing, wished) to go on the tour have to book in advance.

7) Do you hear a man _____ (talked with, talking with) your brother in the living room?
8) Those houses _____ (pulled down, pulling down) were built thirty years ago.
9) The devices _____ (using, used) by advertisers to gain people's attention seem to be effective.
10) Most of the people _____ (invited, inviting) to the reception are old friends of mine.

Write and Translate

Translate the following sentences into English.

1) 昨天讨论的问题十分重要。

_____

2) 他是一个举止得体的人。

_____

3) 已经养成的习惯很难改变。

_____

4) 主席宣读了一份预先准备好的声明。

_____

5) 孩子们更喜欢由橘汁、糖和水制成的饮料。

_____

6) 他得在规定的时间内作出决定。

_____

7) 我们将在下次会议上讨论他提出的计划。

_____

8) 你认识在台上唱歌的那个女孩吗?

_____

Write and Describe

⑥ Write a short passage of about 100 words to describe the picture below. Some useful expressions are provided to help you. The title of your passage is "Visit the Yellow Mountain".



- Location: Anhui;
- Famous For:
  mountain scenery,
  the sea of clouds,
  wondrous pines,
  unique rocks;
- Recognition:
  World Natural and Cultural Heritage,
  National 5A Tourist Attraction.

After-Class Activity

iSmart has more.

Section Ⅳ

Maintaining a Sharp Eye

Passage Ⓐ

Taxi in London

For a true travel experience and to truly enjoy the London streets, make an effort to take a **load** off those tired, tourist-**worn** feet and experience taxiing the way it should be done, by **professionals**.

重负；精疲力竭的
专业人士

Now if you're from the States as I am, the thought of taking a taxi sends your **pulse** racing about as much as a trip to the supermarket. That's because a ride in the **cab** for us is simply being pushed **sideways** in the back of a **smelly** car and being **ignored** by the driver who is on the cell-phone to his girlfriend and worrying how far out of the way we're being routed to run up the meter. Let's face it, Terry was right: The only qualification you need to be a cab driver in the States is to just have a face. This is why I was so taken aback by the experience my wife and I had this summer while traveling through the UK.

脉搏
出租车；向侧面地
发臭的；忽视

Exiting Heathrow Airport, the driver gave us a friendly smile as greeted us with a **"hallo"** and opened the back door for us to step into the back of his **spacious** taxi, offering more leg room than the passenger side of my own **sedan**. We stretched out in the back seat and I couldn't help thinking that if this car was available for **hire** when I were to my **senior prom**, I would gladly have shelled out the **bucks**.

离去
（等于hello）
宽敞的
轿车
租用；高中毕业舞会
元（等于dollar）

As soon as we were free of the busy Heathrow's traffic, our driver, Terry, as we soon found out, engaged us in conversation. By the time we reached our hotel, we were old friends. He told us that we must try Yorkshire **pudding** but keep away from any Shepherd's **Pie** that wasn't homemade, like his wife's (We were half expecting an invitation). At the hotel, Terry, not walked, but ran our luggage up to the front door. I wouldn't have been surprised at all if he would have checked us in and

布丁；馅饼

carried our bags **straight** up to our room. After we over-**tipped** him, he tipped his cap and wished us well. I miss Terry.

直接地；给小费

Note Heathrow Airport 希思罗机场（英国伦敦）。

Window on Useful Expressions

make (an) effort	（做出）努力
take off	脱掉；取消
race about	在…来回奔走
take aback	感到吃惊
stretch out	伸展
senior prom	高中毕业舞会
shell out	掏（钱）
keep away	（from)避开

Read and Think

❶ **Answer the following questions according to the passage.**

1) For the author, what is a professional choice for experiencing London, to go on foot or to take a taxi?

_____

2) Which country is the author from?

_____

3) What is the author's impression on US's taxi drivers?

_____

4) What did the taxi driver do for the author and his wife?

_____

5) How does the author describe Terry, the London taxi driver?

_____

ad and Complete

Fill in the blanks with the proper words given below, changing the form if necessary.

space	ignore	professional	smelly	homemade
senior	sideways	straight	exit	load

1) She is taking some of the _____ off the secretaries.
2) He _____ all the "No Smoking" signs and lit up a cigarette.
3) They were accommodated in a _____ room upstairs.
4) He believes that co-operation with the media is part of his _____ duties.
5) All our products are _____ with the freshest vegetables and fruits.
6) It seems hard to believe that such things went on among _____ directors.
7) The garbage was so _____ that he nearly threw up.
8) He made his way to the _____ in a cloud of security men.
9) We had to get through the narrow opening _____.
10) He arrived at the office at nine o'clock in the morning and went _____ to the advertising section.

ad and Translate

Translate the following sentences into English, using the phrase after each sentence.

1) 如果你把手伸出就能感觉到在下雨。stretch out
_____
2) 我们努力了解每个客户的业务和目标。make an effort
_____
3) 史密斯先生决定出售他在那家公司的股份。sell out
_____
4) 近年来他一直从事科研工作。be engaged in
_____
5) 我劝你离他远点，他很危险。keep away from
_____

Read and Simulate

❹ **Pay attention to the italicized parts in the English sentences and translate the Chinese sentences by simulating the structures of the English sentences.**

1
- *For* a true travel experience and to truly enjoy the London streets, make an effort to take a load off those tired, tourist-worn feet and experience taxing the way it should be done, by professionals.
- *For* added safety, please lock the door to the kitchen.

⇒
- 为了这次演出，她已经学会了用西班牙语演这个角色。

2
- *This is why* I was so taken aback by the experience my wife and I had this summer while traveling through the UK.
- I thought *this is why* I've travelled thousands of miles.

⇒
- 这就是我作出这一决定的原因。

3
- We stretched out in the back seat and *I couldn't help thinking* that if this car was available for hire when I were to my senior prom, I would gladly have shelled out the bucks
- *I couldn't help laughing* every time I think of that.

⇒
- 我无法忘记她有多漂亮。

4
- *By the time* we reached our hotel, we were old friends.
- *By the time* I got to the top of the hill, I was quite out of breath.

⇒
- 我到家时累得无法动弹了。

5
- *I wouldn't have been surprised* at all if he would have checked us in and carried our bags straight up to our room.
- *I wouldn't have got burned* if I would have been in the shade like all the other tourists.

⇒
- 要是知道你昨天晚上很忙，我就不会来了。

upon departure 离开或动身的时候 U1P1
upon request 应…请求 U1P1
ask about 征求对…的意见 U1P2
be satisfied overall 总体满意 U1P2
customer feedback 顾客反馈 U1P2
go on a trip 去旅行 U1P2
home in on 瞄准，针对 U1P2
in short 简言之 U1P2
meet the need(s) of 满足…的需要 U1P2
meet the standard(s) of 达到…的标准 U1P2
set the tone for 为…定基调 U1P2
with *sth.* in mind 把…记在心头 U1P2

UNIT 2

cream /kriːm/ *n.* 奶油，奶油食品 U2S1
customer /ˈkʌstəmə/ *n.* 顾客，主顾 U2S1
fork /fɔːk/ *n.* 叉，餐叉 U2S1
madam /ˈmædəm/ *n.* 夫人 U2S1
pour /pɔː/ *v.* 倒出（液体） U2S1
reserve /rɪˈzɜːv/ *v.* 预订 U2S1
slice /slaɪs/ *n.* 薄片，切片，部分 U2S1
soda /ˈsəʊdə/ *n.* 汽水，苏打水 U2S1
well-done /ˌwel ˈdʌn/ *a.* 煮烂了的 U2S1
wine /waɪn/ *n.*（葡萄）酒 U2S1
bill /bɪl/ *n.* 账单 U2S2
special /ˈspeʃəl/ *n.* 特色菜 U2S2
tip /tɪp/ *v.* 付小费 *n.* 小费 U2S2
café /kəˈfeɪ/ *n.* 小餐厅，咖啡屋 U2S3
sandwich /ˈsænwɪdʒ/ *n.* 三明治 U2S3
bless /bles/ *v.* 保佑 U2P1
cliché /ˈkliːʃeɪ/ *n.* 老生常谈，老套 U2P1
cuisine /kwɪˈziːn/ *n.* 烹饪 U2P1
float /fləʊt/ *v.* 漂浮 U2P1
guy /gaɪ/ *n.* 家伙 U2P1
locate /ləʊˈkeɪt/ *v.* 位于 U2P1
plus /plʌs/ *conj.* 另外 U2P1
regional /ˈriːdʒənəl/ *a.* 当地的 U2P1
snack /snæk/ *n.* 小吃 U2P1
target /ˈtɑːgɪt/ *v.* 以…为目标，瞄准 U2P1
unlimited /ʌnˈlɪmɪtɪd/ *a.* 无限的 U2P1
vegetarian /ˌvedʒɪˈteərɪən/ *n.* 素食主义者 U2P1
wonder /ˈwʌndə/ *v.* 想，想知道 U2P1
active /ˈæktɪv/ *a.* 活跃的，积极的 U2P2
add /æd/ (to) *v.* 添加 U2P2
bride /braɪd/ *n.* 新娘 U2P2
consideration /kənˌsɪdəˈreɪʃən/ *n.* 考虑周到 U2P2
couple /ˈkʌpəl/ *n.*（一对）夫妻 U2P2
excited /ɪkˈsaɪtɪd/ *a.* 激动的 U2P2
expectation /ˌekspekˈteɪʃən/ *n.* 期望 U2P2
experience /ɪkˈspɪəriəns/ *v.* 体验 U2P2
grace /greɪs/ *n.* 风度，文雅 U2P2
groom /gruːm/ *n.* 新郎 U2P2
intelligent /ɪnˈtelɪdʒənt/ *a.* 聪明的 U2P2
magic /ˈmædʒɪk/ *n.* 魅力 U2P2
memory /ˈmeməri/ *n.* 回忆 U2P2
radiance /ˈreɪdiəns/ *n.* 容光焕发，辐射 U2P2
remarkable /rɪˈmɑːkəbəl/ *a.* 非凡的，显著的 U2P2
sincerely /sɪnˈsɪəli/ *ad.* 真心地 U2P2
thoughtfulness /ˈθɔːtfəlnɪs/ *n.* 体贴，关心 U2P2
toast /təʊst/ *n. v.* 敬酒，举杯敬酒 U2P2

go Dutch （用餐）各付各的账 U2S1
service charge 服务费 U2S2
be located in / beside 坐落在 U2P1
City God's Temple 城隍庙 U2P1
da bao *v.* 打包 U2P1
go out for lunch 外出吃午饭 U2P1
go places 到处走走，去各地 U2P1
have a nice time 玩得开心 U2P1
have something secret in their plan 有什么秘密事在策划 U2P1
lol (laugh out loud) 大声笑 U2P1
signature dish 招牌菜 U2P1
the best place to eat / live / see 吃 / 住 / 观光的最好地方 U2P1
treat *sb.* to lunch 请某人吃午饭 U2P1
wonder about 想，考虑 U2P1
Yu Garden 豫园 U2P1
as time goes by 随着时间的流逝 U2P2
bring back memory 引起回忆 U2P2
drink a toast to 为…干杯 U2P2
lifelong partnership 终生伙伴 U2P2
sincere wish 真诚的祝愿 U2P2
with great pleasure 高兴地（做…） U2P2

UNIT 3

buck /bʌk/ *n.* 元（等于 dollar） U3P1
cab /kæb/ *n.* 出租车 U3P1
exit /ˈeksɪt/ *v.* 离去 U3P1
hallo /ˈhæləʊ/ *int.*（等于 hello） U3P1
hire /haɪə/ *n.* 租用 U3P1
ignore /ɪgˈnɔː/ *vt.* 忽视 U3P1
load /ləʊd/ *n.* 重负 U3P1
pie /paɪ/ *n.* 馅饼 U3P1

professional /ˌprəˈfeʃənəl/ *n.* 专业人士 U3P1
pudding /ˈpudɪŋ/ *n.* 布丁 U3P1
pulse /pʌls/ *n.* 脉搏 U3P1
sedan /sɪˈdæn/ *n.* 轿车 U3P1
sideways /ˈsaɪdweɪs/ *ad.* 向侧面地 U3P1
smelly /ˈsmelɪ/ *a.* 发臭的 U3P1
spacious /ˈspeɪʃəs/ *a.* 宽敞的 U3P1
straight *ad.* 一直地；直接地 U3P1
tip /tɪp/ *v.* 给小费；倾斜 U3P1
worn /wɔːn/ *a.*（指人）看起来筋疲力竭的 U3P1
appointment /əˈpɔɪntmənt/ *n.* 约见 U3P2
briefly /ˈbriːfli/ *ad.* 简短地 U3P2
contact /ˈkɒntækt/ *n.* 联系 U3P2
deal /diːl/ *n.* 交易，买卖 U3P2
gatekeeper /ˈgeɪtˌkiːpə/ *n.* 看门人，守门员 U3P2
gracious /ˈgreɪʃəs/ *a.* 有礼貌的，文雅的 U3P2
handle /ˈhændl/ *v.* 处理 U3P2
identify /aɪˈdentɪfaɪ/ *v.* 说明身份 U3P2
pad /pæd/ *n.* 记事本 U3P2
prior /ˈpraɪə/ *a.* 先前的 U3P2
proper /ˈprɒpə/ *a.* 适当的 U3P2
reference /ˈrefərəns/ *n.* 参考，查考 U3P2
say /seɪ/ *v.* 比如说 U3P2
state /steɪt/ *v.* 说明 U3P2
technique /tekˈniːk/ *n.* 技巧 U3P2
virtually /ˈvɜːtʃuəli/ *ad.* 实际上，事实上 U3P2

place of interest 名胜 U3S1
make (an) effort （做出）努力 U3P1
take off 脱掉；取消 U3P1
race about 在…来回奔走 U3P1
take aback 感到吃惊 U3P1
stretch out 伸展 U3P1
senior prom 高中毕业舞会 U3P1
shell out 掏（钱） U3P1
keep away (from) 避开 U3P1
be sure to be polite 一定要有礼貌 U3P2
follow up at a later time 随后跟上 U3P2
from the start 从一开始 U3P2
have a reference later 以后查考 U3P2
leave the door open 敞开大门 U3P2
listening noise 接听电话的应答声 U3P2
make or break deals 做成或打断交易 U3P2
on a positive note 以积极正面的口气 U3P2
reach the party 接通对方 U3P2
remind... of 提醒，使想起 U3P2
take / leave a message 记录 / 留口信 U3P2
telephone etiquette 电话礼仪 U3P2

UNIT 4

alright /ˌɔːlˈraɪt/ *a.* 好的 U4S1
congratulation /kənˌgrætʃʊˈleɪʃən/ *n.* 祝贺 U4S1
decline /dɪˈklaɪn/ *v.* 谢绝 U4S1
drag /dræg/ *v.* 拽，拖拉 U4S1
embassy /ˈembəsi/ *n.* 大使馆 U4S1
movie /ˈmuːvi/ *n.* 电影 U4S1
request /rɪˈkwest/ *v.* 请求 U4S1
roller-skating /ˈrəʊlə ˈskeɪtɪŋ/ *n.* 滑旱冰 U4S1
skiing /ˈskiːɪŋ/ *n.* 滑雪 U4S1
super /ˈsuːpə/ *a.* 好极了 U4S1
suggestion /səˈdʒesʃən/ *n.* 提议 U4S1
anniversary /ˌænɪˈvɜːsəri/ *n.* 周年纪念 U4P1
auction /ˈɔːkʃən/ *n.* 拍卖 U4P1
barbecue /ˈbɑːbɪkjuː/ *n.* 烧烤野餐 U4P1
benefit /ˈbenɪfɪt/ *v.* 资助 U4P1
cordially /ˈkɔːdiəli/ *ad.* 衷心地 U4P1
guild /gɪld/ *n.* 同业公会 U4P1
plaza /ˈplɑːzə/ *n.* 广场 U4P1
recruitment /rɪˈkruːtmənt/ *n.* 招聘 U4P1
reunion /riːˈjuːnjən/ *n.* 团聚 U4P1
acceptable /əkˈseptəbəl/ *a.* 可接受的 U4P2
cocktail /ˈkɒkteɪl/ *n.* 鸡尾酒 U4P2
commonly /ˈkɒmənli/ *ad.* 通常地 U4P2
crime /kraɪm/ *n.* 大错 U4P2
desire /dɪˈzaɪə/ *v.* 希望 U4P2
embarrassing /ɪmˈbærəsɪŋ/ *a.* 尴尬的 U4P2
executive /ɪgˈzekjʊtɪv/ *n.* 主管 U4P2
format /ˈfɔːmæt/ *n.* 格式 U4P2
given /ˈgɪvən/ *a.* 给定的 U4P2
guideline /ˈgaɪdlaɪn/ *n.* 指导方针 U4P2
image /ˈɪmɪdʒ/ *n.* 形象 U4P2
investigation /ɪnˌvestɪˈgeɪʃən/ *n.* 调查研究 U4P2
likely /ˈlaɪkli/ *a.* 可能的 U4P2
mystery /ˈmɪstəri/ *n.* 谜 U4P2
notation /nəʊˈteɪʃən/ *n.* 标记 U4P2
occasion /əˈkeɪʒən/ *n.* 场合 U4P2
preprinted /prɪˈprɪntɪd/ *a.* 预先印好的 U4P2
reception /rɪˈsepʃən/ *n.* 招待会 U4P2
remind /rɪˈmaɪnd/ *v.* 提醒 U4P2
seminar /ˈsemɪnɑː/ *n.* 研讨会 U4P2
timing /ˈtaɪmɪŋ/ *n.* 时间选择 U4P2