The Effectiveness of Asynchronous Mooc Learning for Vocabulary Acquisition Among Chinese Undergraduates

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ABSTRACT

Asynchronous online learning has increasingly been recognized as a flexible and accessible approach for enhancing language proficiency among ESL and EFL learners. Although the overall impact of asynchronous learning on language acquisition has been extensively examined, investigations into its specific influence particularly on vocabulary development remain comparatively limited. This study examines the effectiveness of asynchronous online learning, via the Chinese University MOOC platform, in expanding English vocabulary among Chinese undergraduate students. Employing a mixed-methods design, 30 non-English majors completed a four-week online vocabulary course. Quantitative data were collected through pretests and posttests using the Productive Vocabulary Levels Test (PVLT) to assess knowledge of word form, meaning, and use. Semi-structured interviews investigated learners' experiences, perceptions of the platform, and challenges encountered, providing qualitative insights to complement the quantitative analysis. Results indicated significant gains in learners' productive vocabulary and the interview data revealed that students valued the platform's flexibility and reported increased motivation and autonomy in learning, yet also cited limitations such as limited peer interaction and occasional technical issues. These results suggest that asynchronous MOOC-based instruction can effectively enhance English vocabulary size. Implications of this study highlight the potential of asynchronous platforms for vocabulary acquisition and highlight the need to address these limitations in course design.

Keywords: Asynchronous Learning, Vocabulary Acquisition, MOOC platforms

INTRODUCTION

Vocabulary acquisition is the cornerstone of second language (L2) learning and plays a vital role in enabling learners to improve their communicative competence and for overall development of the specific language skills (i.e., listening, speaking, reading and writing). Without sufficient vocabulary, learners cannot express their thoughts or understand the meaning of others (Schmitt, 2020; Meganathan et al., 2019). As Wilkins (1972) said, 'without grammar, people can't express much; without vocabulary, they can't express anything' (p.80). This statement profoundly points out the centrality of vocabulary in language communication. Therefore, for L2 learners, the limitation of vocabulary size and vocabulary depth can pose a big challenge the process of language use (Nation, 2001; Huckin, 1995; Read, 2000).

While vocabulary breadth usually refers to the total amount of words learners have mastered, vocabulary depth involves the understanding of collocation, polysemy, grammatical function and contextual appropriateness (Nation, 2001). If learners only accumulate vocabulary without understanding how it is used in real contexts, it will be difficult for them to express themselves accurately in real communication. Only when both vocabulary breadth and vocabulary depth are well developed can learners improve their fluency and use the L2 accurately and appropriately in real communication (Webb, 2007). Furthermore, improved vocabulary competence can also enhance learners' self-confidence, reduce language anxiety (Horwitz et al., 1986), and stimulate their motivation for language learning (Meganathan et al., 2020). Therefore, vocabulary acquisition is one of the central components of L2 acquisition in terms of communicative competence, language skill development, and learning psychology.

Meanwhile in the Chinese educational context, English is not only a crucial subject in basic education but is also widely recognised as a core competency contributing to individuals' career advancement, national modernisation, and international cooperation (Qi, 2016). Despite its importance, traditional vocabulary instruction in China continues to be heavily influenced by exam-oriented pedagogies, relying on rote memorisation, vocabulary list recitation, and translation-focused techniques (Yang & Dai, 2011). Although these methods may support short-term retention of spelling and basic word meanings, they often fail to promote deeper lexical competence, including collocational knowledge, contextual usage, and pragmatic functions essential for authentic communication (Schmitt, 2008; Wang, 2023). Within this teacher-centered instructional model, vocabulary learning becomes largely individual and passive students are expected to memorise on their own after receiving limited explicit instruction on word form and meaning (Oxford & Crookall, 1990; Yang & Dai, 2011). As a result, vocabulary learning is frequently undervalued in the broader process of L2 acquisition, leading to gaps between receptive knowledge and productive use. Recognising these limitations, studies (e.g., Ponniah, 2016; Meganathan et al., 2019, 2020, 2024; Schmitt, 2014) have increasingly advocated for diversified and strategic vocabulary learning approaches that can better support learners' needs and promote more effective vocabulary development.

Alternative learning approaches that overcome the limitations of conventional instruction and provide greater opportunities for learners to acquire the three core dimensions of vocabulary form, meaning, and use through meaningful contexts and a balanced combination of intentional and incidental vocabulary learning (Meganathan et al., 2019; Ponniah, 2016). Only when all three aspects are enhanced can learners confidently use the learned vocabulary to communicate with others in real-life interactions, thereby achieving a comprehensive improvement in language proficiency.

Accordingly, the emergence and widespread adoption of digital learning models in recent years have introduced new avenues for improving L2 vocabulary acquisition beyond traditional classroom methods. For instance, asynchronous learning platforms (e.g., Massive Open Online Courses, Duolinguo App, Bubei Words App) provide a flexible and autonomous learning environment for vocabulary learning. This mode breaks the constraints of time and space, provides learners with diverse learning resources, and at the same time enhances the learning experience and outcomes through multimodal resources (e.g., video explanations, interactive exercises, vocabulary quizzes, instant feedback, etc.) (Shandra & Chystiakova, 2021; Varkey, 2023; Vidhiasi, 2021; Hew & Cheung, 2014). In vocabulary learning, asynchronous platforms can help learners recognise words, strengthen their memory, and deepen their understanding of vocabulary meaning and use through multiple exposures and diverse resource designs (Perveen, 2016). Therefore, asynchronous learning platforms such as MOOC are considered an innovative means to enhance the efficiency of L2 vocabulary acquisition and have been widely used worldwide (Zhang & Tananuraksakul, 2023).

LITERATURE REVIEW

Oxford and Crookall (1990) classified vocabulary learning techniques into four main categories:

contextualization, semi-contextualization, full contextualization and adaptable strategies. Under these strategies, there are 13 mainstream vocabulary learning strategies, including vocabulary lists, associative memory, visual representations, structured review, etc., which provide references of great practical value for both learners and educators. Meanwhile, Schmitt (2008) similarly encourages the use of diverse strategies in vocabulary learning, arguing that implicit and explicit learning should be combined, and that meaning, form, and fluency should be well integrated so that learners can be helped to construct learning frameworks effectively in a systematic way.

Adequate vocabulary not only provides a basis for comprehension for language input (e.g., reading and listening), but also provides expressive resources for language output (e.g., writing and speaking); Nation (2006) found that the vocabulary required for comprehending an ordinary text should cover at least 95-98% of the vocabulary of the text, or else learners' comprehension will be interrupted frequently due to the interference of unfamiliar words. Vocabulary also plays a central role in writing and oral expression. An increase in vocabulary enables learners to organise language more flexibly and accurately, express complex ideas, and respond appropriately in different contexts. According to Nation (2006), for L2 learners, 2000-3000 words are needed to achieve everyday communication, but 8000-9000 words are needed to accurately comprehend a various text (e.g. novels, newspapers). These figures highlight the magnitude of the challenge faced by learners in vocabulary acquisition and reinforce the importance of effective vocabulary learning strategies in L2 development.

When examining learners' vocabulary level, most studies usually determine the change in their vocabulary level by measuring the change in their vocabulary size. Uchihara and Clenton (2020) found that learners with more vocabulary are usually perceived to have higher vocabulary proficiency in oral expressions. Although learners with more vocabulary did not use a lot of low-frequency vocabulary (i.e., what is perceived as complex vocabulary) in their expressions, their overall fluency and accuracy were higher than those of others in their oral expressions. This is also consistent with the view of Nation, proving that vocabulary is a vital indicator of language ability.

At the same time, numerous studies have shown that vocabulary depth contributes independently and significantly to language comprehension and expression (Alqallaf & Ahmed, 2022). First, vocabulary depth enhances learners' precise grasp of word meanings and reduces the likelihood of ambiguity, thus improving reading and listening accuracy (Stæhr, 2008). Second, rich vocabulary depth helps learners to use vocabulary flexibly in writing, reading and speaking, increasing the variety and naturalness of language output (Laufer & Waldman, 2011; Read & Dang, 2025). Li and Kirby (2015) found that vocabulary breadth is a stronger predictor of identifying surface meanings of words in reading, while vocabulary depth helps learners predict and understand deeper textual meanings for more abstract or generalized reading tasks. Vocabulary breadth and vocabulary depth, as the two core dimensions of vocabulary knowledge, play complementary and critical roles in L2 acquisition. Therefore, in vocabulary learning, learners should take both into account, laying a good foundation and expanding the depth of vocabulary, so as to acquire vocabulary more firmly and comprehensively (Yang & Dai, 2011; Read & Dang, 2025).

As a learning model that is not constrained by time or space, asynchronous learning has been widely adopted by learners in recent years, particularly following the outbreak of the COVID-19 pandemic. Due to the inability of educational institutions to establish complex online teaching systems, asynchronous learning

quickly gained popularity and widespread application due to its flexibility, and even became the primary mode of teaching and learning under special circumstances (Daniel, 2020). Many researchers have found through their studies (e.g., Yip & Kwan, 2006; Ajabshir & Sadeghi, 2019; Karaaslan, 2018; Choo & Ng, 2024) that asynchronous learning can effectively help learners master more L2 vocabulary. This study argues that assessing learners' vocabulary mastery should be approached from a deeper and more comprehensive perspective. While this perspective can be assessed from multiple angles, existing research has primarily focused on learners' basic mastery of vocabulary size. Many studies have directly compared changes in learners' vocabulary size before and after intervention by setting up pre-tests and post-tests (e.g., Sudarmaji, 2022; Al-Jarf, 2005; Karaaslan, 2018), thereby intuitively demonstrating that the use of asynchronous learning platforms can effectively enhance learners' vocabulary reserves.

What's more, when exploring the role of asynchronous learning platforms in L2 vocabulary acquisition, many studies (e.g., Karaaslan, 2018; Rigo & Mikuš, 2021; Zarei & Amani, 2018) have chosen to set up comparison tests between a control group (traditional synchronous learning) and an experimental group (asynchronous learning) to compare the effects of the two learning modes on vocabulary acquisition. Sudarmaji (2022) employed this method to compare the effects of synchronous and asynchronous vocabulary learning on English vocabulary acquisition among junior high school students. The results showed that the experimental group's vocabulary scores were significantly higher than those of the control group after the intervention, indicating that asynchronous mobile learning is superior to traditional teaching in enhancing vocabulary mastery. Additionally, due to objective factors such as differences in learners' proficiency levels and platform usage, as well as the higher demands of asynchronous learning on learners' self-management skills, another study (Lotfi & Hosseini, 2019) found that learners who received synchronous instruction outperformed those who received asynchronous instruction in vocabulary learning outcomes post-intervention.

While synchronous and asynchronous learning have distinct characteristics, it is undeniable that the features of both learning methods can complement each other in enhancing learners' vocabulary mastery from different perspectives. Synchronous learning offers real-time interaction and feedback, helping learners clarify doubts, solve problems, promote understanding and engagement, and enhance collaborative and communication skills. Asynchronous learning, on the other hand, offers more personalised learning options, allowing learners to understand, practice, and review at their own pace (Hrastinski, 2008). Studies by Khodaparast and Ghafournia (2015) as well as Koivuniemi (2012) revealed that if learners combine traditional synchronous instruction with supplementary learning via asynchronous learning platforms, it can help students master vocabulary more effectively. In addition to that Perveen (2016) also found through a survey of learners' subjective perceptions that students tend to prefer a blended learning model combining synchronous and asynchronous learning, supporting the view that combining both modes can better enhance English proficiency.

Despite the growing adoption of digital and asynchronous learning platforms for L2 vocabulary acquisition, several gaps remain in the current literature. First, most studies have focused primarily on learners' vocabulary size, with limited attention to vocabulary depth, including collocation, polysemy, grammatical function, and contextual usage (Alqallaf & Ahmed, 2022). Second, while asynchronous platforms such as MOOCs offer flexible, autonomous, and multimodal learning opportunities, few studies (e.g., Zhang & Tananuraksakul, 2023) have examined their effectiveness for Chinese university students**,** who face unique educational and linguistic challenges in English learning. Third, existing research often emphasizes overall vocabulary gains (e.g., Meganathan 2024; Read & Dang, 2025; Derakhshan & Khatir, 2015), neglecting learners' subjective experiences, challenges, and strategies in navigating asynchronous learning environments. Finally, although some studies have compared synchronous and asynchronous learning, there is a lack of comprehensive

investigation into how asynchronous learning alone impacts both the breadth and depth of vocabulary knowledge, and how learners perceive and internalize these gains.

Addressing these gaps is essential to provide a more holistic understanding of how asynchronous learning can support effective L2 vocabulary acquisition in higher education contexts. The present study aims to investigate the effectiveness of asynchronous vocabulary learning using a MOOC platform among Chinese university students. Specifically, it seeks to (1) evaluate the impact of this learning model on learners' vocabulary breadth and depth, and (2) examine participants' perceptions of asynchronous vocabulary learning and the challenges they encounter while engaging with the platform. By addressing both quantitative outcomes and learners' subjective experiences, this study provides a comprehensive understanding of how MOOC-based asynchronous learning can support L2 vocabulary acquisition in higher education contexts.

METHODLOGY

Research Design

This study adopts a mixed-methods approach, which combines quantitative analysis and qualitative exploration to systematically assess the role of asynchronous learning platforms (especially Chinese University MOOC platform) in Chinese undergraduates' L2 vocabulary learning. The study was conducted in two phases to ensure the systematic and comprehensive nature of the data. The first phase utilised an experimental pre-test and post-test design, in which the researcher first administers a pre-test to the participants in order to assess their existing vocabulary levels prior to vocabulary learning using the Chinese University MOOC platform. At the end of the one-month online asynchronous learning, participants were given the posttest to assess the changes in their vocabulary levels after the learning. A follow up interview was conducted to access the participants vocabulary acquisition experiences during the asynchronous learning process.

Participants

The participants of the study consists of 30 undergraduate students from Chinese universities, aged between 20 and 23, who were non-English majors. To minimize the potential impact in English proficiency affecting the study results, participants were required to have passed the College English Test Level 4 (CET-4) with a score of at least 500. Since this study focused on online learning, a questionnaire was given to ensure that participants have a high level of interest and motivation in learning English. All participants voluntarily agreed to participate in this study. To protect their privacy, participants appearing in interviews will be identified by pseudonyms.

Instruments

Pre-tests and post-tests were conducted using Nation's Productive Vocabulary Levels Test (PVLT), a tool designed to assess learners' productive vocabulary knowledge in terms of form (spoken form, written form, and word parts), meaning (core meaning, associations, and polysemy), and use (grammatical functions, collocations, and contextual use). The PVLT primarily measures learners' vocabulary use through gap-filling and word stem completion tasks. Typically, the PVLT includes five vocabulary levels to evaluate learners' vocabulary mastery; in this study, the 2,000–3,000-word level was selected to assess participants' learning outcomes. The study focused on the 2,000 and 3,000 PVLT word levels because the participants, who were intermediate-level learners, were not expected to have attained higher-level vocabulary bands such as the 5,000 or 10,000 word levels, making these ranges more suitable for accurately capturing their productive vocabulary knowledge.

In addition, a semi-structured interview lasting approximately 15 minutes was conducted to gather learners' feedback and perceptions of their learning experiences on the Chinese University MOOC platform. The interviews focused on participants' perceptions and the challenges they encountered during the vocabulary learning process. All interviews were audio-recorded with participants' consent and subsequently transcribed for analysis.

Treatment

The treatment in this study involved an asynchronous vocabulary learning intervention conducted through the China University MOOC platform. Participants completed a course titled "Vocabulary Memorization Skills for the Core Examination Points of the University English Grade 6 Exam," designed to enhance their vocabulary knowledge. The course lasted approximately 10 hours and incorporated multimodal instructional resources, including live courses, pre-recorded video lectures by senior teachers, vocabulary exercises, past examination questions, and memory enhancement strategies.

These resources were accessible anytime and anywhere, allowing participants to study at their own pace, thereby reflecting the flexibility and autonomy inherent in asynchronous learning. The live and recorded lessons featured detailed vocabulary explanations and memorization techniques presented by an experienced English tutor, Jia Kun, who holds a Master's degree in TESOL from the University of Hong Kong and a Grade 8 Certificate in English. The course content emphasized a comprehensive understanding of vocabulary, extending beyond word recognition and basic meaning to include collocations, grammatical functions, and contextual usage.

As illustrated in Figures 1 and 2, the initial course interface displayed the types of materials available to learners. Within the video lessons, learners could monitor their progress, adjust playback speed, and review summaries of key strategies. The platform also included a discussion forum integrated with the live courses to facilitate real-time interaction between learners and instructors. Participants were required to complete all learning tasks within four weeks, dedicating approximately 2.5 hours per week to coursework. The platform automatically recorded learning data such as video viewing duration and exercise completion to monitor progress and ensure the reliability of the intervention.

Figure 1 Course Interface

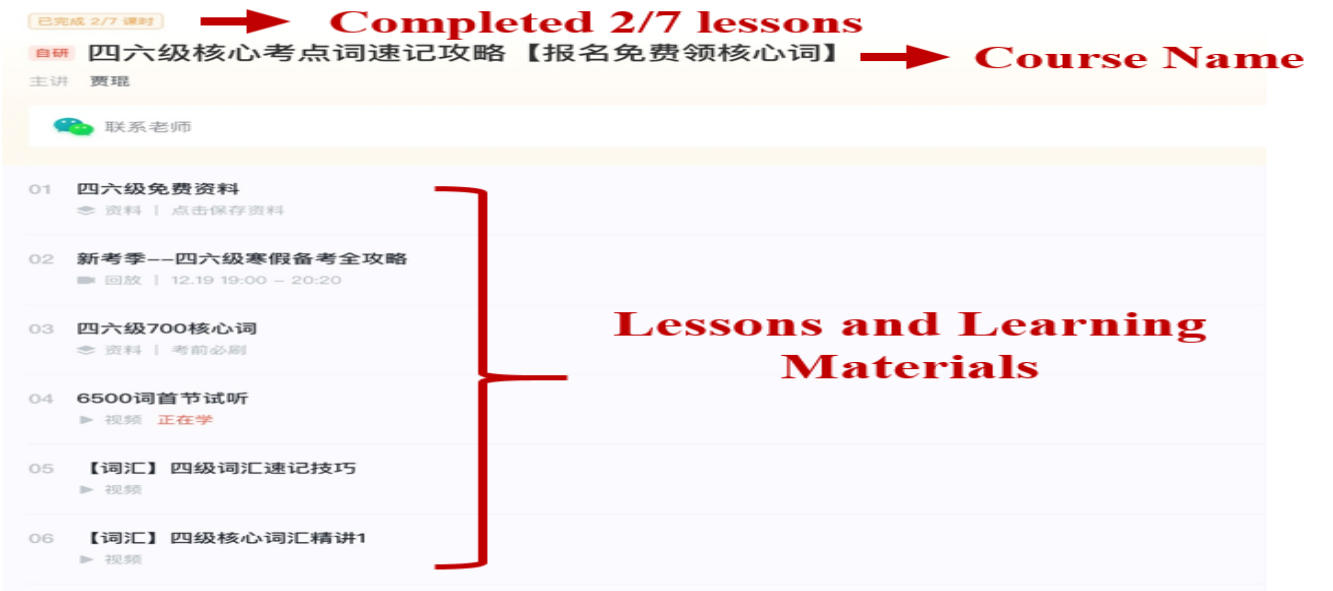

Figure 2 Video Course Interface

Figure 2 Video Course Interface

Data Collection Procedure

The first phase involved quantitative data collection. During the first week, all eligible participants completed a pre-test to assess their initial vocabulary proficiency. The test was administered via the online meeting platform Tencent Meeting. Participants were required to complete the test within a specified timeframe and immediately submit screenshots of their results under camera supervision to ensure academic integrity.

Beginning in the second week, all participants enrolled in an online vocabulary course titled “Vocabulary Memorization Techniques for the College English Test Band 6 Core Exam Points” on the China University MOOC platform. Participants completed the course within four weeks, averaging at least 2.5 hours of video lectures per week. Individual study schedules were determined by the participants according to their availability. They were also required to review the accompanying learning materials. At the end of the four-week course, all participants took a post-test of equivalent difficulty to the pre-test administered in the first week to measure the effectiveness of asynchronous learning on vocabulary mastery.

The second phase involved qualitative data collection. After participants had completed both the learning tasks and post-test in the sixth week, researchers employed stratified random sampling based on pre-test scores to select six students two each from high, medium, and low proficiency groups for follow-up interviews. The interviews were conducted in a semi-structured format, focusing on participants’ experiences with vocabulary learning on the platform, their perceived learning outcomes, and the challenges they encountered. Each interview lasted approximately 15 minutes and was audio-recorded with participants’ consent. The recordings were transcribed verbatim to support subsequent thematic analysis.

Data Analysis

This study employs mixed methods approach to comprehensively analyse data, combining quantitative statistical analysis with qualitative thematic analysis, to fully assess the actual impact of asynchronous learning platforms on Chinese undergraduate students' English vocabulary acquisition and their learning experiences. For the quantitative analysis, SPSS software was used to perform paired sample t-tests on the pre-test and post-test scores of the PVLT to determine whether there was a statistically significant improvement in participants’ vocabulary proficiency following the asynchronous learning intervention. In addition, effect sizes were calculated to assess the magnitude of the intervention effect and to evaluate whether the observed changes in participants’ performance held practical educational significance.

For the qualitative analysis, thematic analysis was conducted to organise and interpret the interview data. The coding process was carried out manually by the researchers. First, each interview transcript was carefully read and initially categorized to identify emerging themes. This was followed by several rounds of refinement and synthesis to establish core thematic categories. The coding combined both theory-driven and data-driven approaches. On the one hand, analytical dimensions were established based on Nation's vocabulary knowledge framework form, meaning, and use and principles of self-regulated learning theory. On the other hand, new themes were inductively derived from participants' statements, allowing for a richer understanding of their learning behaviors, emotional responses, and strategy use within the asynchronous learning environment.

RESULTS AND DISCUSSION

Quantitative Findings

Paired-sample t-tests and effect sizes were calculated using SPSS software to address the following research question: Is there a significant difference between the participants' pre-test and post-test Productive Vocabulary Levels Test (PVLT) scores?

The results indicated that the mean score on the pre-test was 10.20, whereas the mean score on the post-test increased to 11.07, yielding a mean difference of 0.87. This increase suggests that most participants' vocabulary output ability improved following the four-week asynchronous learning intervention. Regarding data distribution, the standard deviation of the pre-test was 1.32, while that of the post-test was 1.64, indicating a slight increase in variability among participants' post-test scores. Although individual differences in performance were somewhat greater after the intervention, the overall variation remained within a manageable range.

Table 1 Descriptive Statistics

Item	Sample Size	Mean	Standard Deviation	Maximum	Minimum
Pre-test	30	10.20	1.32	13	7
Post-test	30	11.07	1.64	14	8

To determine whether the observed improvement in vocabulary scores was statistically significant, a paired samples t-test was conducted, and the results are presented in Table 2. The mean difference between post-test and pre-test scores was -0.87 (indicating that post-test scores were higher than pre-test scores), with a t-value of -3.112 and a two-tailed p-value of 0.004. Because the p-value is below the conventional threshold of 0.01, the difference is considered statistically significant at the 1% level. These results support the hypothesis that asynchronous learning via MOOC platforms can produce meaningful gains in students' vocabulary proficiency over a relatively short instructional period. The findings indicate that the improvement in participants' vocabulary scores was unlikely due to chance, suggesting that the asynchronous learning intervention had a positive effect on vocabulary acquisition.

Table 2 Paired Samples T-test

Item	Mean	Standard Deviation	Mean Difference	t	p
Pre- test	10.20	1.32	-0.87	-3.112	0.004**
Post- test	11.07	1.64			

*p<0.05**p<0.01

To evaluate the practical significance of the learning effect, Cohen's d was calculated. The resulting value of 0.568 corresponds to a medium effect size according to Cohen's (1988) guidelines (0.2 = small, 0.5 = medium, 0.8 = large). This indicates that the asynchronous learning intervention not only produced a statistically significant improvement but also had a meaningful educational impact. The medium effect size suggests that asynchronous learning can serve as an effective pedagogical approach for enhancing vocabulary acquisition. Furthermore, the 95% confidence interval for the mean difference ranged from -1.436 to -0.297, which does not include zero, providing additional evidence of the robustness of the observed effect.

Table 3 Effect Size Analysis

Comparison Groups	**Mean Difference**	**Confidence Interval(95%CI)**	**df**	**Standard Deviation of the Difference**	**Cohen's d**
Pre- test vs Post-test	-0.87	-1.436~-0.297	29	1.525	0.568

Qualitative Findings

The qualitative analysis of the study revealed four main themes. These themes are examined in turn, with learners' perspectives and emotions illustrated through representative quotations. The data provides a deeper understanding of the underlying mechanisms of asynchronous vocabulary learning and enriches the interpretation of participants' experiences on the MOOC platform.

Positive Feedback on Asynchronous Learning

The data indicated that interviewees reported varying degrees of positive experiences regarding vocabulary expansion, firmness of memorisation, and flexibility in vocabulary use. This finding is consistent with previous research on asynchronous language learning platforms (e.g., Karaaslan et al., 2018; Choo & Ng, 2024) which highlights how the flexible and multifaceted features of such platforms facilitate vocabulary acquisition and consolidation from multiple perspectives.

"In live classes, teachers use Chinese words or pictures with similar pronunciations to explain vocabulary, which helps me remember words more deeply. For example, when the teacher explained the word "ambulance," because its Chinese pronunciation is similar to "I can't die," I can associate its meaning with the word as soon as I see it."(Jasmine)

"The teacher was very detailed in explaining each word during the lecture and would compose jingles for us to remember the words, for example, when memorizing the word 'balloon', she associated the ball with the moon and said that the ball can only fly to the moon when it becomes a balloon. That made me remember it well." (Alice)

These descriptions illustrate that, during asynchronous learning, participants developed a deeper understanding of the meaning of vocabulary. In traditional classroom settings, teachers often have limited time to help students memorize words. In contrast, asynchronous platforms provide targeted courses without the constraints of a fixed teaching schedule, allowing instructors to employ creative strategies that enhance vocabulary retention. The use of native-language associations to support lexical understanding aligns with the Association dimension in Nation's (2001) vocabulary framework. This strategy not only deepens learners' comprehension of word meanings but also facilitates recall and contextual application (Aitchison, 2012). Through frequent exposure to contextual cues and diverse interpretive methods, learners gradually construct a

semantic network linking vocabulary to specific contexts, thereby achieving deeper mastery of word meanings and promoting transfer to practical usage (Meganathan, 2019).

“The teacher categorizes and explains words with fixed affixes or roots, which helps me form a general impression of them. Then, when I encounter specific vocabulary, I can judge the emotional connotation of their meanings. For example, words beginning with “mal” have negative connotations, so when I see the word “malicious,” I can immediately associate it with a negative meaning.” (Mike)

“I kept spelling 'embarrassment' wrong, always forgetting whether it was two r's or two s's. Then my teacher said something funny, 'A person who is mocked has to endure double the shame, so there are two r's and two s's.' This stuck in my mind right away. I memorized that one and never misspelled it again.”

Regarding the form dimension of vocabulary, interviewees’ feedback emphasized both spelling memorization and morphological understanding. Instruction on word formation enabled learners to grasp the logic underlying new words and develop the ability to analyze and infer the meanings of unfamiliar words. This reasoning-based strategy helps learners comprehend new vocabulary more effectively and prevents reliance on rote memorization. As Hamzah et al. (2009) noted, knowledge of word structure is a crucial aid for vocabulary learning, enhancing both efficiency and retention. By recognizing roots and affixes, participants were able to infer the general meaning of words, facilitating quicker contextual comprehension in exams (McBride-Chang et al., 2008). In terms of spelling memorization, respondents reported that mnemonic explanations and associations provided on the platform were highly effective for mastering frequently misspelled words. Ben’s example illustrates a localized spelling strategy that integrates Chinese linguistic habits and emotional cues, which improves both spelling accuracy and memory durability (Ghazal, 2007).

“I used to only use some more basic collocations when I wrote essays, and these collocations sometimes didn't fully express my meaning, but after the teacher explained and summarized richer collocations I feel I can express more accurately.” (Alice)

“I used to write 'I think' and 'a lot of' in my essays, but the teacher said they were too colloquial and should be replaced by 'in my opinion/view' or 'a large number of', then I noticed that academic writing should use more formal words.” (Emily)

Interviewees indicated that through the numerous examples sentences and summarized collocations presented in MOOC courses, they not only “recognize the word” but also “know how to use it.” In traditional classrooms, due to time constraints, learners' mastery of vocabulary collocations is relatively limited. Therefore, when they need to use collocations, they often rely on their native language as a reference and directly translate and construct collocations based on the combinations of native language words (Ellis, 1997). This approach often neglects the collocation patterns of verbs and nouns, as well as adjectives and nouns in English, causing learners to make a large number of collocation errors.

On the other hand, MOOC courses present learners with a large number of high-frequency collocations through contextual displays, phrase cards, and contextualized multiple-choice questions, helping them accumulate more vocabulary collocations. This also transforms vocabulary from isolated use to integrated output, significantly enhancing the accuracy and authenticity of expression. Additionally, they gain a deeper understanding of the functional, tonal, and appropriateness aspects of vocabulary in specific contexts. As Nation (2001) argues, true mastery of a word involves not only understanding its meaning and form but also grasping its usage patterns and stylistic features across different contexts, and this “deep vocabulary knowledge” is crucial for advanced expression. Many students often encounter issues such as “inappropriate

vocabulary use" and "style mismatch" in writing or speaking, which stem from a lack of stylistic awareness (Biber & Conrad, 2009). However, MOOC courses enable learners to select vocabulary more accurately in different communicative tasks through extensive contextualized presentation and targeted categorization.

Feedback from interviews indicates that teachers employed strategies such as native language coordination, association methods, and rich contextual input in asynchronous learning sessions, which significantly enhanced learners' deep understanding and retention of vocabulary meanings. Such designs inherently represent intentional learning strategies, where learners are explicitly aware that they are engaged in vocabulary learning, with the goal of memorizing and mastering the vocabulary in the course. Additionally, due to the flexible viewing mechanisms of asynchronous courses, learners continuously receive extensive contextual input through repeated exposure to video content and example sentence explanations. This process inevitably involves some incidental learning, which also positively promotes vocabulary retention (Meganathan 2019; 2020).

Positive Role of Platform Design

The respondents generally agreed that some of the features of the platform were designed to enhance the efficiency and depth of vocabulary learning to a great extent.

"In the usual classroom the teacher sometimes speaks faster, and the teacher starts to speak the next word before I can hear it clearly. But on the MOOC platform I can pause or go back to a point at any time." (Ben)

Compared to traditional teaching models, asynchronous learning platforms enable learners to adjust their learning pace flexibly based on their language proficiency and schedule. For an example, learners can control video playback speed, choose the order of learning content, and watched instructional materials. This self-regulated learning mechanism, which allows learners to adjust their pace and input methods, reflects the asynchronous platform's respect for individual differences while also effectively enhancing students' sense of engagement and control during learning. According to Little (1991)'s self-regulated learning theory, autonomy is an important psychological mechanism influencing language learners' long-term motivation and learning outcomes.

Additionally, MOOC platforms widely employ multimodal methods to present vocabulary content, including live streams, videos, audio, images, and written materials. This not only provides learners with multidimensional, immersive language input but also significantly enhances the intuitiveness and efficiency of vocabulary learning.

"When the teacher talks about the difference between 'implement a policy' and 'execute a plan', she has two sets of images of the meeting and the execution of the operation. 'execute' puts more emphasis on 'action' and 'implement' is more policy or strategy oriented." (Jasmine)

"The platform will prompt me that the word 'symptom' has been wrong twice, and will also recommend that I add it to my vocabulary error book to review it repeatedly, so that I can strengthen my memory of the word." (Mike)

These excerpts suggest that while purely linguistic explanations can help learners initially grasp the semantic differences between synonyms, memory of such vocabulary often fades without multidimensional reinforcement. On MOOC platforms, instructors use images and typical collocations to aid memory, which can

to some extent deepen learners' recall. In addition to graphic support, MOOC platforms incorporate a wealth of authentic language materials, such as reading questions, audio clips, and dialogue simulations, providing contextualized input that overcomes the limitations of traditional textbooks teaching “isolated examples” (Gilmore, 2007).

Perceived Benefits and Perceptions of MOOC Functions

During the interviews, most participants expressed positive and affirming attitudes toward the asynchronous learning model, noting that MOOC-based instruction provided substantial flexibility, autonomy, and sustainability for vocabulary learning.

“Usually busy during the day when there are classes, can only go back to the dormitory in the evening to learn, usually live classes are arranged in the evening, so that the staggered. If I don't want to learn today or something happens I can also watch the replay the next day.”(Alice)

“Although there are times when the teacher speaks a bit fast, I can set the video to 0.75x speed or I can watch it more than once so that I have enough time to take notes.” (Emily)

These excerpts suggest that participants valued the temporal flexibility offered by the MOOC platform, which allowed them to engage in learning at a pace aligned with their individual schedules. The functional design of the MOOC platform enables learners to adjust to their own pace of life and language base, which enhances the sense of control in the learning process, and thus promotes the activation and retention of motivation and improves the Learning efficiency. In addition, respondents generally believe that vocabulary learning itself has a strong “repetitive” and “rhythmic variability”, and asynchronous learning can effectively adapt to the individual needs of different learners in terms of memorization cycle, review frequency and learning rhythm.

As seen in the experts below, the most participants noted that they are willing to continue to use asynchronous learning platforms for learning when necessary. This suggests that, due to the lower cost and increased efficiency associated with asynchronous online learning, a considerable number of learners prefer such platforms as a more practical option for improving their proficiency and preparing for examinations, compared to more costly traditional face-to-face training courses.

“I've now gotten used to memorizing a little bit of words every day using the platform, which has that punch card and wrong word reminder function. I think it's a lot more effective than the kind of mechanical brushing of word books I used to do, and when I have spare time even for ten minutes I can review it.” (Ben)

“I used this kind of platform (Chalk Education) before when I took the teacher's license exam, I followed the teacher for several months, and finally I passed the exam, so I think this kind of learning mode is effective for me, and I'm willing to use the MOOC platform when I study for the sixth grade.” (Emily)

The interview findings indicate that learners’ willingness to continue using the platform is influenced not only by its usability and content, but also by the stable learning habits they have developed over extended use. Over time, learners internalize knowledge of the platform’s functions, allowing these features to become an integral part of their learning behavior. In this sense, the asynchronous learning platform transitions from being merely an external tool to serving as a structural support system within their overall learning process. Moreover, participants’ willingness to engage with the platform is driven not only by present positive experiences but also by positive perceptions shaped through previous successful learning outcomes. Consequently, the platform has

been incorporated into their cognitive schema as an "effective learning tool", leading to transfer effects and strategic generalization. From a cognitive psychology perspective, this phenomenon can be interpreted as cognitive model transfer, in which learners associate learning strategies with successful outcomes based on past experience and attempt to replicate or extend these strategies to new learning tasks (Gick & Holyoak, 1980).

Negative Feedback of Asynchronous Learning

Although most respondents acknowledged the flexibility and extensive resources provided by MOOC platforms for vocabulary learning, they also highlighted several difficulties and challenges faced during actual use. The primary issue reported by the participants was the limited interaction and insufficient feedback offered by the platform.

"Sometimes I see example sentences that I don't quite understand and want to ask about them, but the teacher can't see the messages either, and there is no one who can answer my doubts, unlike in the classroom where I can ask questions on the spot." (Alice)

"After learning the usage of some vocabulary words, I want to ask the teacher or classmates whether such collocations are appropriate, but no one usually replies to me in the comment section." (Mike)

Several interviewees mentioned that one of the major challenges in vocabulary learning through MOOC platforms is the "lack of verification or guidance on language usage," referring to the limited interaction and practical feedback available. Although MOOC platforms offer a wide range of well-structured vocabulary explanations and exercises, learners often lack timely, practical feedback on their word usage. This gap not only disrupts learning continuity but also hinders the immediate resolution of language-related difficulties. In addition, the asynchronous nature of these platforms reduces real-time communication opportunities with teachers and peers, limiting learners' chances to practice meaningful language production and receive targeted corrective guidance.

As Swain (2005) emphasized, effective language learning requires not only comprehensible input but also productive output that stimulates deeper processing and enhances retention. In other words, vocabulary can only be fully acquired through repeated attempts and corrective feedback in authentic usage (Nation, 2001). Therefore, although MOOC platforms are highly effective in facilitating vocabulary input, they remain insufficient in supporting output-based learning processes and interactive language development at the pragmatic level. Moreover, while the "high flexibility" of asynchronous learning serves as a major advantage, it simultaneously places greater demands on learners' self-regulation skills. Many participants reported difficulties in maintaining consistent learning behavior and a stable study schedule due to the absence of external supervision and fixed timelines.

"Although I know that this course can help me master more vocabulary of CET-6, because it's still a long time before the exam and the content of this course is not too much, so my study is intermittent, and there are times when the interval is a little bit longer I forget a little bit about what I've learned before." (Doris)

"I had planned to watch half an hour to an hour of the course every day, but sometimes I got busy during the day and missed it and procrastinated, then I didn't open the platform for a couple of days, and I didn't catch up on the content until close to the time of the course deadline." (Jasmine)

Since asynchronous learning is a learning model that allows learners to freely arrange their own schedules, feedback from interviewees indicates that learning behavior is prone to interruption when there is a lack of self-planning or external reminders. This is particularly true when tasks are heavy or course intensity is high, as students are more likely to procrastinate and experience reduced learning efficiency. For students who have not yet developed mature learning strategies, this high degree of freedom may actually become an obstacle to completing tasks. However, self-regulation requires long-term persistence, which demands that learners possess a high level of self-control. Many learners are easily distracted by environmental factors, emotions, or external temptations. Therefore, the lack of effective reminders and supervision on asynchronous platforms also exacerbates procrastination and interruptions to some extent.

CONCLUSION

This study investigated the impact of asynchronous vocabulary learning on the English vocabulary proficiency of Chinese university students. Through a combination of quantitative test data and qualitative interview analysis, the findings indicate that asynchronous learning has a positive effect on L2 vocabulary acquisition. The results demonstrated an overall improvement in learners' vocabulary output ability following the intervention. Statistical analysis showed that post-test accuracy increased significantly after four weeks of asynchronous learning, with a moderate effect size. Interview feedback further supported these findings, with students reporting that the flexibility and diverse learning resources offered by the asynchronous platform facilitated vocabulary retention and engagement.

This study provides meaningful evidence that asynchronous learning via MOOC platforms can positively influence L2 vocabulary acquisition among Chinese university students. Its significance lies in demonstrating that digital, self-directed learning environments are not only capable of supporting vocabulary breadth but also contribute to learners' productive use of vocabulary, complementing traditional classroom instruction. The findings highlight that flexibility, multimodal resources, and repeated exposure to key features of asynchronous platforms indeed can enhance learners' engagement, motivation, and retention of vocabulary, offering practical strategies for higher education contexts where large class sizes and limited instructional time often constrain individualized learning. Furthermore, the study broadens current understanding by showing how self-paced digital tasks can create individualised learning pathways, enabling learners to revisit, rehearse, and personalize vocabulary learning in ways that may not be feasible in face-to-face instruction.

From a pedagogical perspective, the study implies that integrating asynchronous learning into L2 curricula can provide students with opportunities to reinforce and expand vocabulary outside of formal classroom settings, promoting more autonomous and self-regulated learning. For educators, the results suggest the value of designing digital tasks that balance vocabulary input, meaningful practice, and opportunities for learner reflection to maximize both comprehension and productive use. In particular, embedding interactive elements such as formative quizzes, automated feedback, and multimodal vocabulary presentation may further enhance the effectiveness of asynchronous learning environments.

While the study provides valuable empirical evidence of the effectiveness of asynchronous learning for English vocabulary development among Chinese undergraduates, several factors should be considered in interpreting the results. First, the sample size was relatively small, which may limit generalizability. Nonetheless, the observed improvements provide meaningful insights into how asynchronous learning can support L2 vocabulary acquisition. Future research might also consider including delayed post-tests (e.g., 1–3 months after the intervention) to assess retention and application over time. Additionally, future studies should explore a more diverse range of participants across different proficiency levels to determine whether

asynchronous learning benefits lower-proficiency learners equally. Incorporating comparison groups such as synchronous, face-to-face, or blended learning conditions would also help establish clearer causal relationships between learning mode and vocabulary development.

The study underscores the potential of blended approaches that combine asynchronous and synchronous elements, allowing learners to benefit from both flexible (Cahyani et al., 2021), self-paced study and interactive feedback from instructors and peers. Finally, this study contributes to the growing body of research on digital L2 learning in China, addressing a gap in understanding how asynchronous platforms support vocabulary acquisition in higher education. The results can guide curriculum developers, instructional designers, and policymakers in implementing effective technology-enhanced learning strategies, ultimately fostering more effective, engaging, and learner-centered English instruction.

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