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Original Paper

The Effectiveness and Optimization Pathways of Fragmented Learning in University English Vocabulary Acquisition

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Abstract

Against the backdrop of flourishing digital education, fragmented learning has emerged as a significant approach for university students to build English vocabulary. This paper analyzes the characteristics, theoretical foundations, and effectiveness of fragmented learning in university English vocabulary acquisition. Drawing on empirical cases and cognitive science principles, it reveals both the advantages in enhancing vocabulary memorization efficiency and the challenges posed by systemic shortcomings. Further optimization pathways are proposed, including goal-oriented planning, integration of multimodal resources, and gamified incentive mechanisms. These aim to provide college students with scientific and efficient fragmented vocabulary learning solutions, promoting systematic knowledge construction and the formation of long-term memory.

Keywords

fragmented learning, university English vocabulary, Ebbinghaus curve, mobile learning, multimodal resources

1. Introduction

With the widespread adoption of internet technology and mobile devices, fragmented learning has emerged as a primary mode for contemporary university students to accumulate English vocabulary. By transforming scattered time into learning opportunities and leveraging the convenience of digital resources, it overcomes the temporal and spatial constraints of traditional classroom learning. However, the non-systematic nature of fragmented learning has also sparked debates regarding knowledge fragmentation and inconsistent learning outcomes. Balancing the flexibility of fragmented learning with systematic approaches has become crucial for enhancing the efficiency of university English vocabulary acquisition.

2. Literature Review

2.1 Concept and Characteristics of Fragmented Learning

Fragmented learning refers to informal learning conducted by learners using fragmented time, fragmented media, and fragmented resources. It lacks explicit goals or direction, yet it is not merely the accumulation of knowledge and information. Instead, it requires learners to actively think, select and reconstruct knowledge from an overload of information, and rebuild connections between knowledge points. “Accumulating small amounts to achieve a large sum” is the universal principle and specific strategy of fragmented learning, with selection being its key. The purpose of fragmented learning is to create value and meaning—learning for acquisition, with a results-oriented approach.

2.2 Importance and Methods of Vocabulary Building in University English

English vocabulary forms the foundation of language learning, and a rich lexicon enhances university students’ listening, speaking, reading, and writing abilities. Traditional vocabulary learning methods, such as memorizing word lists and completing vocabulary exercises, are often tedious and fail to meet students’ needs for learning during fragmented time. In recent years, with the advancement of mobile learning technology, utilizing fragmented time for English vocabulary learning has become a growing trend.

2.3 Current Research on Applying Fragmented Learning to English Vocabulary Acquisition

Existing studies have examined the application of fragmented learning in vocabulary building. Some research indicates that fragmented learning can boost learner motivation and efficiency. By strategically utilizing fragmented time, learners can expand their vocabulary without disrupting regular studies or daily life. However, other studies point out that fragmented learning suffers from issues such as scattered content and lack of systematic structure, which may hinder learners' deep understanding and long-term retention of vocabulary.

3. Research Methodology

3.1 Research Participants

This study involved 200 students from freshman to junior years at a university. These participants exhibited varying levels of English proficiency but all possessed a foundational knowledge of the language.

3.2 Experimental Design

The 200 students were randomly divided into an experimental group and a control group, each comprising 100 participants. The experimental group employed a fragmented learning approach for English vocabulary acquisition, while the control group utilized traditional concentrated learning methods. The experiment spanned one semester, during which data on learning time, content, and effectiveness were recorded for both groups.

3.3 Data Collection and Analysis

Data was gathered through questionnaires, vocabulary tests, and learning journals. Questionnaires

assessed students' attitudes toward fragmented learning; vocabulary tests evaluated vocabulary acquisition and learning outcomes; learning journals documented daily study activities. Statistical analysis compared differences between groups in vocabulary acquisition, learning efficiency, and satisfaction levels.

3.4 Research Findings

3.4.1 Effectiveness of Fragmented Learning in English Vocabulary Acquisition

3.4.2 Vocabulary Acquisition Volume

Experimental results indicate that over the one-semester study period, students in the experimental group acquired an average of 20% more vocabulary than those in the control group. This demonstrates that fragmented learning effectively utilizes students' fragmented time, increases vocabulary learning opportunities, and thereby enhances vocabulary acquisition.

3.4.3 Learning Efficiency

Regarding learning efficiency, the experimental group demonstrated superior performance. Since fragmented learning allows flexible scheduling based on student' time and energy levels, learners can study when most alert, avoiding fatigue and distraction associated with prolonged concentrated study. Consequently, experimental group students mastered more vocabulary per unit of time.

3.4.4 Learning Satisfaction

Student surveys revealed higher satisfaction with the fragmented learning approach among the experimental group. They perceived it as flexible and convenient, accommodating their temporal and spatial learning needs. Additionally, the diverse content enhanced learning engagement.

4. Challenges of Fragmented Learning in English Vocabulary Acquisition

4.1 Disjointed Learning Content

While fragmented learning effectively utilizes spare moments, it often results in unsystematic content. When studying vocabulary during breaks or commutes, students typically memorize only spellings and basic definitions, neglecting usage and collocations. For instance, when learning "implement," they might only recall its meaning as "carry out" without recognizing its common pairing with "policy" in phrases like "implement a policy." This superficial approach prevents students from building a comprehensive vocabulary knowledge system. It's akin to constructing a house by merely stacking bricks without an overall structural design—resulting in an unstable and functionally inadequate building.

4.2 Lack of Learning Continuity

The discontinuous scheduling of fragmented learning disrupts continuity. Studying different vocabulary content at different times impairs students' memory and comprehension of words. According to the forgetting curve theory, timely review and repetition enhance memory retention. However, in fragmented learning, students might study technical vocabulary one day and everyday vocabulary the next, lacking effective review and transition between sessions. This makes it difficult for the brain to

establish strong connections between new words and existing knowledge, reducing memorization effectiveness and impairing the understanding of how vocabulary functions in different contexts.

4.3 High Demands on Self-Management Skills

While fragmented learning grants students autonomy over scheduling and content, it demands exceptional self-management skills. Students must strategically allocate fragmented time to ensure efficiency, yet many lack time management awareness and techniques, failing to utilize time effectively. Additionally, fragmented learning is prone to external distractions like phone notifications and environmental noise. Some students struggle with self-discipline, becoming easily distracted during study sessions, which undermines their motivation and initiative, ultimately leading to suboptimal learning outcomes.

5. Discussion

5.1 Analysis of Factors Behind the Effectiveness of Fragmented Learning

The significant effectiveness of fragmented learning in building university English vocabulary stems from multiple underlying reasons. This section provides a detailed analysis from three key dimensions: maximizing fragmented time utilization, aligning with cognitive learning principles, and stimulating learning interest.

5.1.1 Making the Most of Fragmented Time

In the daily lives of modern college students, uninterrupted blocks of study time are often limited, with academic assignments, club activities, and personal matters occupying much of their schedule. However, there exists a wealth of seemingly insignificant fragmented time—such as breaks between classes, commutes to and from school, waiting in lines, and brief intervals before or after meals. Though individually brief, these fragments can accumulate into substantial learning opportunities when effectively utilized, significantly boosting vocabulary acquisition.

Take class breaks as an example: the 10-minute intervals between lessons offer ample chance for quick vocabulary review via mobile apps. Over the course of a day, the cumulative study time from multiple breaks adds up considerably. With consistent effort over time, students can accumulate a substantial vocabulary without even realizing it. Similarly, commuting to and from school presents another opportunity. For students using public transportation, the journey typically involves a certain amount of time. They can utilize this period to listen to English vocabulary audio, building mental associations between pronunciation and meaning. This approach maximizes time usage without disrupting their regular commute. Queuing is another common scenario for fragmented time. Whether waiting in line at the cafeteria or at the bank, students can pull out their phones to browse concise vocabulary resources like flashcards or short English passages, building their vocabulary while waiting.

This efficient utilization of fragmented time breaks the traditional reliance on fixed schedules and locations for learning. It allows study to flexibly integrate into students' daily lives, providing more opportunities and time for vocabulary accumulation, thereby effectively enhancing learning outcomes.

5.1.2 Alignment with Cognitive Learning Principles

From a cognitive science perspective, spaced learning demonstrates clear advantages over massed learning in enhancing efficiency, and fragmented learning is a quintessential manifestation of spaced learning. The human memory system operates according to unique principles: the brain does not memorize and consolidate information instantly but requires repeated exposure and reinforcement.

In block learning, students often concentrate on a large volume of vocabulary over an extended period. This approach can easily lead to mental fatigue and information overload, resulting in shallow memory retention and increased susceptibility to forgetting. For instance, if a student attempts to memorize 50 new words in one afternoon, the sheer volume of information received in such a short time makes it difficult for the brain to process and store each word deeply. As a result, most of the content is likely forgotten by the end of the day or the next day.

Fragmented learning, however, distributes study content across multiple time slots. Each session is shorter, with a moderate amount of material, aligning with human memory patterns. Repeated exposure to the same vocabulary at different times reinforces memory each time. For instance, a student might spend 10 minutes in the morning learning 10 new words, then 10 minutes at noon reviewing those 10 words and learning 5 new ones, followed by 10 minutes in the evening for comprehensive review and consolidation. This spaced learning approach allows the brain ample time to process and store vocabulary information, helping students better memorize and consolidate words into long-term memory.

Furthermore, spaced repetition prevents monotony and boredom during learning, maintaining students' attention and motivation. With shorter study sessions, fatigue is less likely to set in, allowing students to sustain high learning efficiency. Thus, fragmented learning aligns with cognitive principles and enhances vocabulary acquisition effectiveness.

5.1.3 Stimulating Learning Interest

Traditional English vocabulary learning methods are often monotonous and tedious, primarily involving memorizing vocabulary books and completing vocabulary exercises. This approach easily leads to student boredom, diminishing their motivation and initiative. In contrast, fragmented learning offers flexibility and variety, allowing students to freely select learning content and methods based on their interests and needs. This provides ample space for stimulating students' interest in learning.

In terms of content selection, students can choose vocabulary materials based on their hobbies and interests. For instance, sports enthusiasts might study sports-related vocabulary—such as names of athletic events, famous athletes, and common expressions about competitions. Music lovers can expand their vocabulary by learning words from English songs, appreciating music while experiencing the charm of English words. This interest-driven approach encourages students to engage more proactively in learning, boosting their motivation.

Fragmented learning also offers diverse methods. Students can learn vocabulary through short English videos, often presented in engaging formats like animations or sitcoms that capture attention, enabling

learning in a relaxed and enjoyable atmosphere. For instance, some English learning videos introduce new vocabulary through engaging plots and dialogues, providing detailed explanations and examples to facilitate understanding and memorization. Listening to English songs is another popular fragmented learning method, allowing students to absorb vocabulary and expressions while appreciating beautiful melodies and experiencing the rhythmic beauty of the language. Additionally, highly interactive learning methods like online vocabulary games and word competitions allow students to engage with peers through communication and friendly competition, enhancing both enjoyment and challenge.

Through these diverse learning materials and approaches, fragmented learning caters to varied student interests, ignites enthusiasm for vocabulary acquisition, encourages active participation, and ultimately improves learning outcomes.

6. Optimization Pathways for Identified Issues

6.1 Establishing a Systematic Learning Framework

To address fragmented learning content, students should construct a systematic learning framework. Vocabulary can be categorized by themes (e.g., daily scenarios, academic fields, cultural contexts), parts of speech (e.g., verbs, nouns, adjectives), or difficulty levels (e.g., foundational, intermediate, advanced). Integrating related words forms a cohesive knowledge system. For example, under the "travel" theme, group words like "hotel" (noun), 'book' (verb, meaning to reserve a hotel), and "comfortable" (adjective, describing hotel ambiance) into one category. Simultaneously, use mind mapping tools to connect and organize learned vocabulary. Consider a mind map for the "environmental protection" theme: the central term is "environmental protection," branching out to "pollution," "recycle," and "conservation." Each branch further subdivides into specific vocabulary—such as "air pollution" and "water pollution" under "pollution"—deepening understanding and retention.

6.2 Develop a Coherent Study Plan

Students should create a structured study plan to scientifically allocate time and content. Divide the week into segments—such as after waking up, during breaks, after lunch, or before bed—and dedicate each slot to specific vocabulary topics. For example: - Learn 10 everyday vocabulary words after waking up - Review the previous day's vocabulary during breaks - Study 10 academic vocabulary words after lunch - Summarize the day's learning before bed This ensures consistency and structure in learning. Additionally, regular review and summarization are crucial—such as systematically revisiting weekly vocabulary on Sundays through dictation and sentence construction to reinforce knowledge.

6.3 Enhancing Self-Management Skills

Improving self-management skills is central to ensuring the effectiveness of fragmented learning. Students can enhance their motivation and self-discipline by setting clear, specific, and measurable learning goals—such as mastering 200 high-frequency vocabulary words within a month—developing detailed study plans that break down larger objectives into daily tasks, and utilizing learning reminders

like phone alarms or notification features in educational apps. Simultaneously, students must learn to manage external distractions like phone notifications and ambient noise. Techniques such as disabling phone alerts and selecting quiet study environments help maintain a positive learning mindset and consistent study habits.

6.4 Integrating Diverse Learning Resources and Methods

To enrich content and enhance learning outcomes, students should combine multiple resources and approaches. Beyond vocabulary apps, they can: watch English films to reinforce vocabulary through audiovisual immersion; and participate in English corners to practice vocabulary usage through conversation. Additionally, employ memory techniques like association (e.g., linking “ambulance” to “I can't die”) and root/suffix recognition (e.g., understanding “bio-” as life makes “biology” easier to recall) to boost vocabulary retention efficiency.

7. Conclusion

This study demonstrates that fragmented learning yields significant results in university English vocabulary acquisition, increasing vocabulary accumulation, learning efficiency, and satisfaction. However, fragmented learning also presents challenges such as scattered content, lack of coherence, and high demands on self-management skills. These issues can be effectively addressed through optimized approaches such as establishing a systematic learning framework, developing coherent study plans, enhancing self-management skills, and integrating diverse learning resources and methods. This will further improve the effectiveness of fragmented learning in English vocabulary acquisition. Future research could explore leveraging emerging technologies like artificial intelligence and virtual reality to optimize fragmented learning models, providing more personalized and efficient learning solutions for university students' English vocabulary development.

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