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English Vocabulary Learning Strategies: Insights from Computer Specialties Students

Summary

This study explores English vocabulary learning strategies used by computer specialties students at Kyiv National University of Technologies and Design. Investigating student essays (n = 94), the research identified a preference for active learning (regular practice, English media with subtitles) and contextualization (associative learning). This contrasts with the curriculum's emphasis on memorization. These findings highlight the need for curricular reform to embrace technology and active engagement strategies, empowering students to excel in the English--dominated field of computer science.

Keywords: active learning, computer specialties students, learning strategy, English vocabulary, university

1. Introduction

Strong English language proficiency is an undeniably crucial asset for computer specialties students. Within the contemporary scientific landscape, a significant portion of the field's most advanced research and development is documented and disseminated primarily in English. This necessitates a well-developed vocabulary to navigate the field's complex terminology, fostering collaboration with international peers and active participation in professional conferences and workshops. Given that vocabulary is an essential building block of linguistic proficiency, devoting focused effort to vocabulary acquisition becomes a critical aspect of successful English language learning (Purwanto et al., 2022, p. 179).

The rapid pace of technological innovation in computer science and information technology demands a reevaluation of university curricula to ensure graduates possess the necessary skills and knowledge to thrive in this ever-evolving landscape (Malykhin et al., 2024, p. 182). A crucial component of this reevaluation must be a focus on strong English language proficiency. Graduates with a well-developed vocabulary and communication skills will be better positioned to contribute and collaborate on a global scale.

Kugai & Vyshnevska's research (2023, pp. 95–96) as for the peculiarities of teaching foreign languages to computer specialties students found that integrating foreign language education into computer science curricula presents unique challenges due to the interplay between language acquisition and the specific cognitive demands of the field. Among the challenges the authors mention cognitive overload and analytical thinking, technical jargon and domain-specific terminology, time constraints and intensive curriculum, abstract concepts and concrete expression, limited exposure to cultural contexts. These distinctive difficulties call for tailored pedagogical approaches. This can include teaching them techniques like spaced repetition for vocabulary retention, active learning approaches for grappling with technical jargon, and encouraging them to seek out cultural contexts beyond the classroom to bolster their understanding. However, simply employing specific techniques, while

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valuable, is not sufficient. Equipping students with the ability to develop their own learning strategies empowers them to independently navigate the challenges they face.

Learners leverage a toolbox of methods, called learning strategies, to improve their understanding, retention, and use of new information. These deliberate tactics aim to make learning both more effective, meaning it leads to deeper understanding, and more efficient, by maximizing progress in a shorter time. Learning strategies can be applied throughout the learning cycle, from initial information gathering to final evaluation of one's knowledge (Drew, 2023). By shifting students from passive information receivers to active language learners, learning strategy instruction equips them with the procedures and knowledge needed to optimize their learning experience. This allows them to not only understand how to learn effectively but also confidently apply their acquired skills to achieve success (Syafryadin, 2020, p. 34).

There is a lot of research on vocabulary learning strategies in various populations, but insights from computer science students, who have a specific academic and professional need for strong English, are relatively scarce within the last five years.

In this regard, this study aims to address this gap by investigating the vocabulary learning strategies employed by computer specialties students at Kyiv National University of Technologies and Design. Understanding these strategies can provide valuable insights for educators and students alike, ultimately improving English language proficiency.

2. Research Methodology

Research Background

The study aimed to thoroughly examine the learning strategies that computer specialties students use when learning English vocabulary, and to identify which strategies they consider effective and which they do not. The main goal was achieved through the completion of a sequence of the following subgoals:

- identify the most commonly used learning strategies among computer specialties students for acquiring English vocabulary;
- analyze the perceived effectiveness of different learning strategies among computer specialties students;

- compare the learning strategies used by computer specialties students with those recommended by the curriculum of the "Foreign Language" discipline;
- formulate recommendations for improving the effectiveness of English vocabulary learning among computer specialties students.

Sample

The study sample was selected using a purposive and convenience sampling, based on the fact that all participants are computer specialties students at Kyiv National University of Technologies and Design.

A total of 94 Ukrainian students in their 1st through 4th year of studies, pursuing the following computer science specialties at Kyiv National University of Technologies and Design (Kyiv, Ukraine) participated in the study (all 94 students who participated in the study completed the assigned task) (Table 1):

- 46 students – Computer Sciences;
- 36 students – Software Engineering;
- 12 students – Information Systems and Technologies.

Table 1. Distribution of participants

Specialty	Number of Students (N)
Computer Science	46
Software Engineering	36
Information Systems and Technologies	12

Source: own study (n = 94).

Instruments and Procedures

In English lessons, students were assigned an essay in which they were asked to describe the strategies they use to learn English vocabulary. No list of strategies was provided. In their papers, students did not indicate their surnames or gender, only the specialty they are studying. This was done intentionally, as it was aimed to eliminate any potential bias that could influence the analysis of the data.

Students were required to address two questions in their essays:

- What strategies do they employ to learn English vocabulary?

– Which strategies do they deem effective and which do they not?

Data Analysis

A qualitative analysis of the data collected through student essays aimed to achieve the subgoals outlined in the research background section. Thematic analysis was employed on the student essays. This method involved a close examination of the essays to identify recurring themes and keywords related to the strategies students use for learning English vocabulary. The essays were further analyzed to understand the perceived effectiveness of different learning strategies. Students discussed not only which strategies they used but also which ones they found beneficial and which ones they deemed less effective. A comparison was made between the learning strategies reported by the students and the strategies recommended by the curriculum of the "Foreign Language" discipline at Kyiv National University of Technologies and Design. Informed by the analysis of commonly used strategies, perceived effectiveness, and curriculum alignment, recommendations will

be formulated to improve the effectiveness of English vocabulary learning among computer specialties students.

The study was conducted in October 2023, and it took 2 months to analyze the results. The essays were analyzed using thematic analysis to identify recurring themes and strategies employed by the students.

3. Results

The analysis revealed a variety of strategies employed by the students, with some being more prevalent than others. The students have provided their own interpretation of the strategy names (Table 2).

The most frequently mentioned strategies include:
- Practicing new vocabulary regularly (reviewing vocabulary lists, using flashcards, and incorporating new words into daily conversations):

  "Success in learning new English words can be achieved through a variety of strategies or a combination of them. But it is important to practice regularly, repeat new vocabulary in different contexts, and incorporate them into everyday speech".

Table 2. Study Results: English Vocabulary Learning Strategies (N=94) (sorted by most popular)

Strategy	Number of students (N)	Percentage (%)
Practicing new vocabulary regularly	38	40.43
Watching movies/TV shows in English with subtitles	37	39.36
Using associative learning	27	28.72
Using online language learning apps (Quizlet, Duolingo, Memrise)	26	27.66
Using flashcards	23	24.47
Playing computer games in English	20	21.28
Conversing with native English speakers	16	17.02
Watching short videos in English on social media	16	17.02
Context-based vocabulary learning	14	14.89
Using spaced repetition	13	13.83
Listening to English songs	9	9.57
Creating a glossary of terms	8	8.51
Gamification	6	6.38
Practicing writing new words repeatedly	6	6.38
Reading books in English	5	5.32
Partnering up for vocabulary acquisition	5	5.32
Word grouping based on difficulty level	5	5.32
Online dictionary translation	5	5.32
Learning vocabulary through professional activities (coding)	5	5.32

Source: own study (n = 94).

"I constantly put new vocabulary into practice, trying to incorporate it into my spoken and written language. This helps me solidify my knowledge and improve my communication skills".

- Watching movies/TV shows in English with subtitles (students found this approach helpful for enhancing listening comprehension and learning new vocabulary in context):

"For me, the most effective strategy is watching movies or TV shows. This is an interesting way to learn, as simply memorizing words is very boring for me and therefore not effective. By listening to native speakers, I have started to understand pronunciation better and how they use certain phrases in everyday life".

"For me, an effective method is watching videos and movies in English because you can immediately hear the pronunciation. In general, learning anything is effective if it brings you enjoyment".

- Using associative learning (connecting new words with existing knowledge or creating mental images to aid memorization):

"When I learn new words, I try to connect the word with a familiar image or associate it with an emotion. This makes the memorization process easier".

"I use the associative method. For example, I need to remember the word 'responsibility'. I imagine myself being responsible for an important project and this way I learn the word faster".

- Using online language learning apps (students utilize various language learning apps to practice vocabulary, grammar, and pronunciation):

"When I need to learn new words, I use smartphone apps. They are very convenient because I can study anywhere. They are also helpful because they remind me with notifications. This is great because sometimes I lose motivation or simply forget about the lesson".

"I enjoy using language learning apps like Duolingo. The app has levels like a video game, which motivates me to keep progressing and learn a lot of new things".

- Using flashcards (flashcards are a popular tool for memorizing new vocabulary and their meanings):

"My favorite strategy is using flashcards. They allow me to translate and memorize words in a fun way".

"Flashcards are a great way for me to learn English words. Seeing and writing them all the time helps them stick in my head. I also like that I can take my flashcards with me anywhere, so I can study even when I'm on the go".

The students also provided insights into the perceived effectiveness of different strategies. They generally agreed that strategies that involved active engagement and contextual learning were more beneficial.

Then the analysis was conducted to compare student-reported learning strategies with those recommended by the "Foreign Language" curriculum. While some overlap was identified, notable discrepancies emerged. The curriculum emphasized grammar rules and traditional vocabulary learning methods, such as memorizing word lists and definitions. In contrast, students gravitated towards strategies that fostered active engagement, contextual learning, and the use of technology.

4. Discussion

This study aimed to explore the English vocabulary learning strategies of computer specialties students at Kyiv National University of Technologies and Design. The findings shed light on the student's preferred methods for acquiring English vocabulary and highlight a potential gap between student preferences and curriculum recommendations.

Strong English language proficiency is a cornerstone for success in computer science. The field's advancements are primarily documented and disseminated in English, necessitating a well-developed vocabulary to navigate its complexities (Purwanto et al., 2022; Kugai & Vyshnevska, 2023). This study contributes to the growing body of research on effective vocabulary learning strategies by focusing on a specific population – computer specialties students – whose needs may differ from general English language learners.

The results align with existing research on effective vocabulary learning strategies. The most frequently reported strategies are well-supported by research (Rachmawati, 2017; Thiendathong et al., 2021). These strategies promote active engagement, spaced repetition, and contextualization, all of which have been shown to enhance vocabulary retention.

The student preference for strategies that leverage technology, such as online language learning apps and watching English media, aligns with the growing emphasis on technology-aided language learning. These platforms can offer interactive exercises, gamified elements, and readily available content, making learning more engaging and accessible (Kugai & Vyshnevska, 2023).

This study provides valuable insights but has limitations. Firstly, it focuses on a single university, limiting generalizability. Future research could involve replicating the study with a broader sample of computer science students across different universities. Secondly, the study relied on self-reported strategies, which may be subject to recall bias. Future research could incorporate interviews or learning diaries to gain a deeper understanding of students' cognitive processes during vocabulary learning.

5. Conclusions

The study's findings confirm that effective strategies such as regular language practice, watching English movies, using associative learning, and utilizing language learning apps and flashcards were prevalent among students. However, a gap emerged between these student preferences and the curriculum's emphasis on memorization. This highlights the need for curricular reform to embrace technology-aided learning and active engagement strategies, ultimately empowering computer science students to excel in the English-dominant field.

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