



USING TECHNOLOGIES TO FILL LEXICAL GAPS IN THE PROCESS OF TEACHING THE MOTHER LANGUAGE

Khasanov Abdumannon,
Doctor of Philology (DSc), Institute of the Uzbek Language,
Literature and Folklore, Academy of Sciences of the
Republic of Uzbekistan, Tashkent
abdumannonhasanov3137@gmail.com
ORCID: 0000-0002-8656-0521

Abstract

Vocabulary development is a key indicator of linguistic competence and cognitive growth, particularly within the context of formal education. This study examines the phenomenon of lexical gaps in learners' vocabulary and the mechanisms through which these gaps are formed and compensated in the Uzbek language. Special attention is given to the role of school education as a structured social environment that systematically expands lexical knowledge through subject-specific terminology and conceptual learning. The analysis demonstrates that while school education significantly enriches students' vocabulary, the long-term retention of lexical units depends on their frequency of use, semantic transparency, and degree of integration into everyday communication. Complex international and discipline-specific terms are often acquired through memorization and tend to remain unstable in learners' vocabulary unless reinforced by professional practice. Drawing on lexicographic data and the concept of lexical space, the study argues that lexical gaps are not random but reflect functional and cognitive demands placed on the speaker. The findings contribute to lexicology, sociolinguistics, and language policy by clarifying the interaction between education, lexical structure, and vocabulary sustainability.

Keywords: Education, pedagogy, educational technologies, vocabulary, word acquisition, new word, lexical gaps, children's vocabulary, word usage, animation, animation approach, pedagogical effectiveness.

INTRODUCTION

Vocabulary acquisition is one of the central processes in language development and plays a decisive role in shaping communicative competence. The size and structure of an individual's vocabulary reflect not only linguistic knowledge but also cognitive maturity and social experience. In this regard, lexical gaps – understood as the absence or instability of certain lexical units within a speaker's vocabulary – represent a natural and inevitable phenomenon in language learning.





Formal school education constitutes a key institutional framework for vocabulary expansion. It provides learners with systematic exposure to new concepts, disciplines, and terminological systems, thereby significantly enriching their lexical repertoire. Previous studies have shown that school instruction introduces a large number of subject-specific lexical units, many of which are absent from everyday communication and are acquired primarily through reading and writing activities. At the same time, the effectiveness of vocabulary acquisition is closely related to learners' age-specific cognitive abilities, which facilitate the memorization and use of complex and polysyllabic words.

However, not all lexical units introduced in the educational process become stable components of an individual's vocabulary. Research has indicated that terms borrowed from foreign languages or those that do not conform to the internal word-formation patterns of the language often remain peripheral and require deliberate memorization. Moreover, many scientific terms taught in school have acquired the status of international units, especially in the natural and mathematical sciences [2]. While such terms contribute to vocabulary expansion, they are frequently forgotten after the completion of formal education unless they are regularly used in professional contexts.

To conceptualize this phenomenon, the notion of lexical space provides a productive analytical framework. Just as physical space is structured and bounded, lexical space consists of interconnected units that occupy specific functional positions within the language system. Lexical gaps can thus be understood as unfilled or weakly filled segments of this space. Filling these gaps is largely determined by social factors, with education playing a central mediating role.

The objective of this study was to analyze the nature of lexical gaps in learners' vocabulary and to identify the mechanisms through which they are formed and compensated in the Uzbek language. By integrating lexicographic analysis with insights from sociolinguistics and educational linguistics, the study seeks to clarify the relationship between vocabulary development, lexical space, and formal education.

METHODS

This study employed a qualitative methodological framework grounded in educational linguistics and pedagogical theory. The analysis was based on Howard Gardner's theory of multiple intelligences as the primary conceptual model for assessing the educational potential of animation technologies [6]. The research design focused on identifying and systematizing the types of intelligence most





directly influenced by animated educational materials and evaluating their role in enhancing the quality of the learning process.

The empirical basis of the study consisted of analytical observation of animated educational videos and multimedia presentations used in school instruction. Particular attention was given to the integration of audiovisual elements, narrative structure, and visual symbolism, which are considered key components of animation-based learning materials. These elements were analyzed in relation to five types of intelligence defined in Gardner's model: musical-rhythmic, visual-spatial, linguistic-verbal, logical-mathematical, and intrapersonal intelligence.

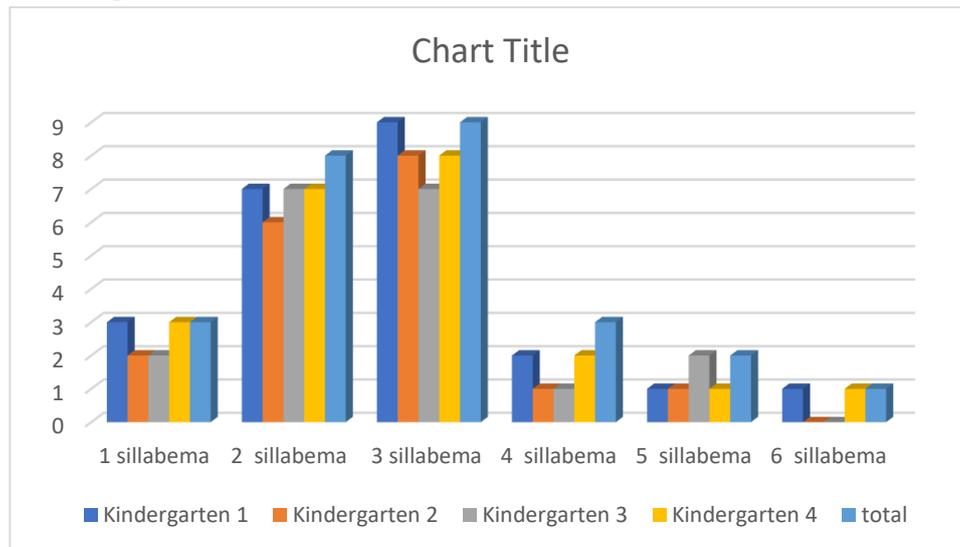
The method of functional analysis was applied to determine how specific features of animation technology – such as synchronized audio, dynamic visual representation, and contextualized imagery – contribute to learners' perception, memorization, and interpretation of educational content. In addition, a comparative method was used to contrast animation-based instructional materials with traditional text-based explanations in terms of their cognitive accessibility and multimodal engagement [5].

The study also relied on a descriptive-analytical approach to interpret pedagogical outcomes reported in existing educational practices, including classroom observations and instructional materials developed by animation studios for school curricula [7]. These materials were examined for their relevance to age-specific cognitive characteristics of learners and their potential to support long-term knowledge retention.

By combining theoretical modeling with qualitative analysis, the methodology enabled a comprehensive evaluation of animation technologies as a multifaceted educational tool. This approach allowed the study to identify indirect and direct cognitive effects of animation on different types of intelligence, while avoiding experimental manipulation and focusing on pedagogically grounded interpretation.

RESULTS

In our small study, the word acquisition performance of more than 100 children in 4 kindergartens was analyzed. A year-long observation revealed that they can learn up to 20-30 new words in a month. This is an average. But among these children there are also children who have mastered only 10-15 words. Observations have shown that children are more likely to learn words with fewer syllables. Learning and using words that are hard to pronounce and complex can be a bit of a challenge for young children:



As can be seen from the diagram, the rate of acquisition of 2-syllable words by young children in observation is much better. Acquisition of 1- and 3-syllable words is also satisfactory. But such an opinion cannot be said about words with 4-6 syllables.

In school education, young people will have great opportunities to increase their vocabulary while acquiring the literacy of writing and reading in a special environment. In this case, school education provides a wide range of knowledge, teaches various subjects, and focuses on teaching many new words related to relevant subjects, which ensures rapid enrichment of children's vocabulary. At the same time, the fact that school education covers a long period is also of great importance in increasing the vocabulary of students. Also, the age characteristics of students increase their ability to easily memorize and use polysyllabic words.

Naturally, learning such words causes a little difficulty for the student: complex terms that come from a foreign language and do not fit into the word formation patterns of the language can be kept stable in the vocabulary only by memorization [4]. Everyone knows that today the main terms of natural and mathematical sciences taught in school education have become international units. Studying these concepts is also important in increasing the student's vocabulary [1]. Such terms, which are rarely used in everyday life, may be forgotten by the student after finishing school. Only professionals who deal with this term can keep it in their vocabulary for life.

In the explanatory dictionary of the Uzbek language, the word space is described as follows: 1. An empty space surrounded by certain boundaries; location 2. Infinite universe, space, sky; endless space. 3. Vacant land, place. 4. Phys. A place without air, a vacuum [2]. As the first term in this comment, the concept of "space surrounded by certain boundaries" is as clear as day for Uzbek speakers. The concept of lexical space formed on the basis of this concept also serves to name a space in a certain



system. The gap in the child's vocabulary has the same characteristics. Filling it is the goal of the social environment, especially the educational process.

The results of the study indicate that school education plays a key role in the formation and expansion of students' vocabulary. During the educational process, learners acquire a wide range of lexical units through different school subjects, which contributes to the systematic enrichment of both active and passive vocabulary. In particular, the introduction of subject-specific terminology enhances students' ability to comprehend abstract concepts and to use them appropriately in oral and written communication [8].

The findings also demonstrate that the extended duration of school education, combined with age-related cognitive characteristics of students, facilitates the acquisition of complex, polysyllabic, and borrowed lexical units. However, terms that do not conform to the internal word-formation patterns of the language are predominantly retained in the vocabulary through memorization. As a result, many such units tend to remain unstable in active usage and are prone to attrition after the completion of formal schooling.

Further analysis reveals that international terms widely used in natural and mathematical sciences significantly increase the quantitative volume of students' vocabulary, while their functional use in everyday communication remains limited. These lexical units are typically preserved in long-term vocabulary only by individuals who continue to engage with the corresponding professional fields.

The study also confirms the relevance of the concept of lexical space for describing vocabulary development. Based on the semantic interpretation of the word space as a bounded yet structured domain, lexical space is understood as a system in which lexical units occupy specific positions and perform distinct functions. Vocabulary gaps in children's language competence exhibit similar characteristics: they represent unoccupied or weakly developed areas within this lexical space. The findings suggest that filling such gaps constitutes a central objective of the social environment, particularly the educational process, which functions as the primary mechanism for systematic vocabulary expansion.

DISCUSSION

The findings of the present study confirm that vocabulary development in children is closely linked to the structure and duration of formal education, as well as to the cognitive and social environment in which language acquisition takes place. The results support previous studies indicating that school education serves not only as a medium for transmitting knowledge but also as a primary mechanism for systematic





lexical expansion (Umurzakova, 2021). Through subject-based instruction, learners are consistently exposed to new lexical units, which gradually fill existing gaps in their lexical competence.

The observed instability of complex and borrowed terms in students' active vocabulary aligns with earlier research emphasizing the limited assimilation of lexical units that do not conform to the internal word-formation patterns of a language. As noted in prior studies, memorization-based acquisition often results in short-term retention rather than stable integration into the lexical system. This finding reinforces the view that lexical units become fully functional only when they are cognitively motivated and structurally transparent to the language user.

The dominance of international terminology in natural and mathematical sciences further illustrates the tension between lexical expansion and functional usage. While such terms significantly increase the quantitative dimension of vocabulary, their limited presence in everyday communication restricts their long-term activation. This observation is consistent with the idea that professional relevance and frequency of use are decisive factors in determining whether a lexical unit remains in a speaker's permanent vocabulary.

The concept of lexical space provides a productive theoretical framework for interpreting these processes. Similar to physical space, lexical space is structured, bounded, and organized according to functional principles. Vocabulary gaps in children's language can thus be interpreted as unoccupied or weakly developed zones within this system. The gradual filling of these gaps through education and social interaction reflects the dynamic nature of the lexical system and its constant adaptation to cognitive needs.

Moreover, the findings highlight the decisive role of the educational environment in regulating the balance between lexical economy and lexical sufficiency. While language tends to avoid excessive proliferation of new words, the emergence of new concepts in cognition inevitably generates a need for nomination. Education mediates this contradiction by selecting, stabilizing, and legitimizing certain lexical units while allowing others to remain context-bound or temporary.

Overall, the discussion suggests that filling lexical gaps is not a spontaneous process but a socially and cognitively conditioned phenomenon. The interaction between thinking, language structure, and educational practice determines which lexical units become entrenched in the language system and which remain peripheral. These results contribute to a deeper understanding of vocabulary development as a dynamic process shaped by both internal linguistic mechanisms and external social factors.





CONCLUSION

This study has demonstrated that vocabulary development is a dynamic and socially conditioned process closely connected with formal education, cognitive growth, and the internal structure of language. The findings show that lexical gaps in children's vocabulary are not accidental but arise as a natural consequence of unequal exposure to concepts, communicative needs, and patterns of language use.

The analysis confirms that school education plays a central role in filling lexical gaps by systematically introducing new lexical units related to academic disciplines. However, the stability of these units in learners' vocabulary depends on their structural transparency, frequency of use, and functional relevance. Lexical items that are acquired mainly through memorization, particularly complex international terms, tend to remain peripheral and are often lost after the completion of formal education unless they are reinforced by professional or practical usage.

The concept of lexical space has proven to be an effective analytical tool for explaining vocabulary gaps and their compensation. Lexical space, similar to physical space, is structured and selective: not all introduced words become fully integrated elements of the system. The filling of lexical gaps is thus influenced by both internal linguistic mechanisms and external social factors, with education acting as a key mediator between cognitive demand and linguistic supply.

Overall, the results highlight the importance of conscious lexical policy in education, emphasizing not only the quantitative expansion of vocabulary but also its qualitative integration into the learner's linguistic competence. The study contributes to lexicology and sociolinguistics by clarifying the mechanisms through which lexical gaps emerge and are compensated, and it provides a foundation for further research into vocabulary development and language planning in educational contexts.

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