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A Study on the Implementation of Crossword Puzzle Games in Teaching Vocabulary

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A B S T R A C T

Vocabulary is a fundamental component of English language proficiency, supporting the development of listening, speaking, reading, and writing skills. Crossword puzzle games have been used in English as a Foreign Language (EFL) classrooms to support vocabulary learning, yet their theoretical foundations and pedagogical mechanisms require further synthesis. This study aims to review the literature on the use of crossword puzzle games in vocabulary instruction, focusing on their theoretical foundations, learning mechanisms, and implications for vocabulary learning outcomes. Using a library research design, this study examined ten scholarly sources comprising books, journal articles, and an undergraduate thesis. The thesis was included as supplementary literature to broaden the discussion of classroom applications, while the findings were interpreted in relation to the available evidence. The reviewed literature suggests that crossword puzzle games are associated with constructivist learning, social interaction, and game-based learning principles. Their potential contributions to vocabulary learning include active word retrieval, repeated engagement with vocabulary, contextual reasoning, motivation, and peer collaboration. However, the strength of the reported benefits may vary depending on instructional design, learner characteristics, and classroom implementation. This review suggests that crossword puzzle games can serve as a supplementary strategy for EFL vocabulary instruction, although further systematic research is needed to establish the consistency and strength of their effects.

Keywords: *Crossword Puzzle Game, Vocabulary Mastery, EFL, Game-Based Learning, Library Research*

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INTRODUCTION

English serves as an international language in communication, education, technology, and global interaction. Vocabulary plays a central role in developing English proficiency because it enables learners to understand information and express ideas effectively. A sufficient vocabulary repertoire supports the development of listening, speaking, reading, and writing skills (Amiruddin & Razaq, 2022). For this reason, vocabulary instruction remains an essential component of English language teaching, particularly at the secondary school level, where students are expected to develop greater independence in using English for academic and communicative purposes.

Despite its importance, vocabulary acquisition remains a challenge for many English as a Foreign Language (EFL) learners. Limited vocabulary knowledge can hinder comprehension, restrict self-expression, and reduce learners' confidence when using English. Students may also experience difficulties retaining unfamiliar words when they lack appropriate learning strategies (Febriyanti & Riandi, 2020). Wefi et al. (2023) similarly emphasize the importance of vocabulary knowledge in developing English proficiency in EFL contexts. These challenges highlight the need for instructional approaches that encourage active participation and provide meaningful opportunities to encounter, practice, and recall new words. Teachers can incorporate various learning media, including flashcards, songs, and educational games, to create more engaging vocabulary learning experiences.

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One instructional strategy that can support vocabulary learning is the crossword puzzle game. This activity requires learners to identify words by interpreting clues and completing intersecting boxes. During the process, students retrieve previously learned vocabulary, connect word meanings with relevant clues, and apply their knowledge to solve problems. Wefi et al. (2023) discuss crossword puzzles as a learning activity that encourages active engagement with vocabulary. The combination of linguistic recall and problem-solving may also make vocabulary practice more engaging than activities that rely primarily on memorization. However, the learning value of crossword puzzles depends on how teachers select vocabulary, design clues, and integrate the activity into instructional objectives.

Recent studies have consistently demonstrated the positive contribution of crossword puzzle games to vocabulary learning across various EFL contexts. Hanna et al. (2024) reported that the use of crossword puzzles as a pedagogical innovation greatly improved eleventh-grade students' vocabulary knowledge, while Iftitah et al. (2024) found that crossword puzzle games successfully increased the vocabulary achievement of junior high school students in Palu. Similarly, Wijaksono & Siddik (2022) found a significant improvement in students' vocabulary knowledge following the application of crossword puzzle games, and Ilma & Hastini (2023) reported a substantial increase in students' vocabulary achievement across three action-research cycles. Pratolo & Hafizhah (2022) further confirmed, through a quasi-experimental design, that crossword puzzle games improved vocabulary mastery significantly compared to traditional teaching methods.

Several studies have also highlighted that game-based learning strategies such as crossword puzzles are effective largely because they reduce learners' language anxiety, increase motivation, and provide repeated, meaningful exposure to target vocabulary (Hidayah et al., 2023). Successful implementation, therefore, depends not only on the puzzle activity itself but also on the theoretical rationale that explains why and how it contributes to vocabulary development.

Although these studies confirm the effectiveness of crossword puzzle games in improving students' vocabulary, most have employed experimental or classroom-action designs that primarily measure learning outcomes. Comparatively fewer studies have synthesized the broader scholarly literature to explain the theoretical basis and underlying mechanisms of crossword puzzle games in vocabulary learning, such as their contribution to student engagement, vocabulary retention, and active interaction in the learning environment. Therefore, this study seeks to address this gap by conducting library research that critically reviews and synthesizes scholarly sources on the implementation of crossword puzzle games in teaching vocabulary, the theoretical basis and underlying mechanisms of their use, and their implications for vocabulary learning outcomes in EFL contexts.

METHOD

Research Design

This study employed a library research design to examine and synthesize theoretical and empirical literature on the use of crossword puzzle games in vocabulary learning in English as a Foreign Language (EFL) contexts. Library research involves collecting, reviewing, recording, and analyzing information from written sources relevant to a particular research problem (Melfianora, 2017; Zed, 2022). This design was appropriate because the study focused on identifying theoretical foundations, pedagogical mechanisms, and reported learning outcomes without collecting primary data from classroom participants. The review followed a thematic synthesis approach to compare findings across sources, identify recurring patterns, and examine differences in how crossword puzzle games support vocabulary learning.

Data Sources and Selection Criteria

The study analyzed ten scholarly sources, comprising five books and five publications consisting of journal articles and an undergraduate thesis. The five books by Connor (2014); Hadfield (1999); Nation (2001); Thornbury (2002); Wright et al. (2006) provided foundational discussions of language-learning games, vocabulary instruction, and vocabulary acquisition.

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The other five sources, namely Pohloh & Ma'rifatulloh (2025); Ramadhania & Adnan (2022); Rifai et al. (2023); Rizqi & Usman (2021); Siregar et al. (2024), provided research-based discussions of crossword puzzle games and vocabulary learning in EFL or Indonesian educational contexts.

The ten sources were selected to provide a focused analytical basis for addressing the research questions rather than to represent the entire body of literature on crossword puzzle games. The selection included both foundational theoretical works and more recent empirical publications to connect established learning principles with reported classroom applications. Books were included when they provided relevant theoretical explanations or pedagogical principles, whereas journal articles and the undergraduate thesis were considered for their descriptions of research contexts, instructional procedures, and reported findings. The undergraduate thesis served as supplementary evidence for classroom applications and was not treated as equivalent to a peer-reviewed journal article in terms of publication status. All sources were assessed for relevance to the research objectives, clarity of information, and contribution to understanding vocabulary learning. The publication period of 2016 to 2026 applied to recent research publications, while older books were retained when they provided essential theoretical foundations. The relatively small number of sources represents a limitation because it may not capture the full range of evidence or conflicting findings in the field.

Research Instruments

The researcher served as the primary instrument for collecting and interpreting information from the selected literature. Two supporting instruments were used: a documentation checklist and a data-extraction table. The documentation checklist helped assess whether each source met the selection criteria, while the data-extraction table organized information consistently across publications. The extracted information included the author, publication year, source type, research context, research objectives, methods, theoretical perspectives, instructional procedures, and reported findings. Additional fields recorded evidence related to vocabulary retention, active recall, repetition, motivation, learner interaction, and vocabulary learning outcomes. These instruments supported systematic comparison across sources and helped distinguish theoretical arguments from findings reported in empirical studies.

Data Collection Procedures

Data collection involved four stages. First, the researcher searched Google Scholar and the ELTS platform using combinations of the following keywords: crossword puzzle game, vocabulary learning, game-based learning, EFL vocabulary instruction, and vocabulary mastery. Second, the researcher screened the identified publications according to their relevance, credibility, and contribution to the research questions. Foundational books were assessed separately from recent empirical publications because they served different purposes in the review. Third, the researcher read the selected sources and recorded information relevant to the study in the data-extraction table. For empirical publications, the extraction focused on research design, participants, instructional procedures, and reported outcomes. For theoretical books, it focused on concepts and explanations related to vocabulary acquisition and language-learning games. Fourth, the researcher organized the extracted information into preliminary categories reflecting the research objectives. The categories were refined during comparison across sources to identify recurring themes, complementary explanations, and differences in the reported evidence.

Data Analysis

The collected information was analyzed using descriptive analysis and thematic synthesis, guided by the interactive data analysis model of Miles et al. (2014). The analysis involved three interconnected stages. First, data condensation was conducted by selecting relevant statements, theoretical explanations, and research findings from each source.

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Information unrelated to crossword puzzle games, vocabulary learning, or the research questions was excluded. Second, data display involved organizing the extracted information into a comparative matrix and descriptive summaries. The researcher compared the sources to identify recurring explanations of how crossword puzzle games may support vocabulary learning. Third, conclusion drawing and verification involved interpreting the identified patterns and checking each interpretation against the original publications.

Thematic categories were developed through a combination of deductive and inductive coding. Deductive coding used concepts established in the literature, including constructivist learning, social interaction, and game-based learning. Inductive coding captured recurring mechanisms and outcomes reported in the selected sources, including active recall, repeated vocabulary exposure, motivation, collaboration, and vocabulary retention. A theme was retained when the extracted evidence showed a clear connection to the research questions, and its interpretation was checked against the relevant source. The analysis also distinguished theoretical explanations from empirically reported outcomes to avoid treating proposed learning mechanisms as proven effects. By comparing findings across different source types, the study developed a thematic account of the pedagogical potential of crossword puzzle games while recognizing the limitations of the available evidence.

FINDINGS AND DISCUSSION

This section presents the findings and discussion derived from the analysis and synthesis of ten scholarly sources, comprising five primary sources (books) and five secondary sources (journal articles and one undergraduate thesis), relevant to the implementation of crossword puzzle games in teaching vocabulary in EFL contexts. In line with the three components embedded in the research question, the discussion is organized into three main parts: the implementation of crossword puzzle games in teaching vocabulary, the theoretical basis and underlying mechanisms of their use, and their implications for vocabulary learning outcomes in EFL contexts.

The Implementation of Crossword Puzzle Games in Teaching Vocabulary

The findings show that, despite differences in educational level and setting, the implementation of crossword puzzle games follows a fairly consistent procedure across the sources reviewed. According to the primary sources, the general procedure begins with the teacher selecting or introducing vocabulary items that have already been taught, followed by the presentation of a crossword grid accompanied by clues in the form of definitions, synonyms or example sentences (Nation, 2001; Thornbury, 2002). Students then recall the target words from memory and fill them into the interlocking grid based on the given clues, and in some variations, students themselves are asked to construct the crossword and write the clues before exchanging puzzles with classmates to solve (Wright et al., 2006). The activity typically concludes with a review session in which the teacher and students discuss and verify the answers together, reinforcing students' understanding of the target vocabulary.

This general procedure is echoed across the secondary empirical sources, which applied crossword puzzle games in a variety of educational settings ranging from elementary school Ramadhania & Adnan (2022) to junior high school Rifai et al. (2023); Rizqi & Usman (2021); Siregar et al. (2024) and to an EFL classroom outside Indonesia(Pohloh & Ma'rifatulloh, 2025). Across these studies, the teacher first introduced the target vocabulary related to the lesson topic, then distributed crossword puzzle worksheets containing contextual clues, after which students identified and filled in the correct vocabulary items based on the clues provided. Once the task was completed, the teacher and students jointly reviewed the answers to confirm the meanings and correct usage of the target words. The consistency of this procedure across primary and secondary sources, despite differences in learners' age and proficiency level, indicates that crossword puzzle games can be flexibly implemented as a structured, clue-based recall activity in a wide range of EFL vocabulary lessons.

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Theoretical Basis and Underlying Mechanisms

The findings indicate that the effectiveness of crossword puzzle games in vocabulary learning can be explained through both cognitive and psychological mechanisms. From a cognitive perspective, Thornbury (2002) explains that crossword puzzles function as consolidation tasks that require active recall of words from memory, a process aligned with the testing effect in cognitive psychology, whereby retrieving knowledge from memory strengthens the memory trace more than repeated study. Nation (2001) supports this cognitive mechanism by emphasizing that effective vocabulary learning requires learners to encounter target words repeatedly and meaningfully, a condition easily met in crossword activities as clues prompt learners to consider word meaning, spelling and usage simultaneously. Connor (2014) adds that the interlocking structure of the crossword grid imposes an additional cognitive demand, as solvers must cross-check each answer against intersecting words, causing them to revisit and reprocess vocabulary items multiple times within a single problem-solving session.

From a psychological and affective perspective, the findings show that crossword puzzle games reduce the anxiety commonly associated with vocabulary learning by framing practice as an enjoyable activity rather than a formal test (Hadfield, 1999). Wright et al. (2006) further note that crossword puzzles belonging to the "create" family of games give students a sense of ownership over their learning, which enhances intrinsic motivation and self-efficacy. These psychological benefits are corroborated by the secondary sources: Siregar et al. (2024) and Ramadhania & Adnan (2022) both reported highly positive student responses and increased emotional engagement during crossword puzzle activities, while Pohloh & Ma'rifatulloh (2025) found that students taught with crossword puzzles demonstrated greater enthusiasm and persistence than those taught with conventional methods.

These cognitive and psychological mechanisms are consistent with several established educational theories. The active, meaning-focused recall demanded by crossword puzzles reflects constructivist learning theory, in which knowledge is actively constructed rather than passively received; this is empirically supported by Quoc & Van (2023), who found that a social-constructivist teaching approach significantly improved EFL learners' vocabulary retention. The collaborative element present when students create, exchange and discuss crossword puzzles together (Hadfield, 1999; Wright et al., 2006) further reflects Vygotsky's social constructivism and the concept of the zone of proximal development, in which learners accomplish more through social interaction than they could individually. Finally, the motivational and anxiety-reducing effects identified across the sources align with game-based learning theory, as also demonstrated by Ahmed et al. (2022), who found that game-based learning significantly reduced EFL learners' language anxiety while boosting their motivation and vocabulary outcomes.

Implications for Vocabulary Learning Outcomes in EFL Contexts

The synthesized findings reveal that crossword puzzle games consistently produce positive vocabulary learning outcomes across different educational levels and EFL settings. At the elementary level, Ramadhania & Adnan (2022) found that crossword puzzle media effectively supported vocabulary mastery among young learners through a fun and interactive learning experience. At the junior high school level, Rizqi & Usman (2021), Rifai et al. (2023) and Siregar et al. (2024) each reported significant improvements in students' vocabulary achievement following the implementation of crossword puzzle activities, attributing this improvement to increased active recall, classroom engagement and structured practice. Beyond the Indonesian context, Pohloh & Ma'rifatulloh (2025) demonstrated that students taught vocabulary through crossword puzzles in an EFL classroom in Thailand achieved significantly better progress than those taught through traditional methods, suggesting that the benefits of crossword puzzle games are not confined to a single cultural or educational context.

These findings carry several practical implications for English teachers. Crossword puzzle activities can be used as an effective reinforcement exercise when carefully aligned with

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specific vocabulary learning objectives (Hadfield, 1999; Thornbury, 2002), and having students construct their own crossword puzzles may deepen engagement by requiring them to consider word meanings and definitions closely when writing clues (Wright et al., 2006). Furthermore, teachers are encouraged to design crossword activities that expose learners to target vocabulary across a variety of meaningful contexts, since repeated and varied exposure is central to durable vocabulary acquisition (Nation, 2001).

Nevertheless, the reviewed sources also point to several limitations in the practical implementation of crossword puzzle games. These include the limited class time available to complete a full crossword activity, particularly when it involves both puzzle creation and solving (Wright et al., 2006); the varying pace of task completion among students with different levels of vocabulary mastery; the need for additional guidance for learners unfamiliar with the crossword format; and the challenge of maintaining classroom management and sustained attention during extended problem-solving sessions. These limitations suggest that the effectiveness of crossword puzzle games in vocabulary instruction depends heavily on careful lesson planning, appropriate calibration of difficulty level, and competent classroom management on the part of the teacher.

CONCLUSIONS

Based on the results and discussion of the ten studies reviewed in this library research, the researcher concludes that scholarly sources consistently indicate that crossword puzzle games are an effective, theoretically based, and widely accepted medium of vocabulary learning in EFL settings. The ten studies reviewed (books, journal articles, one undergraduate thesis) all confirm that crossword puzzle games are appropriate, beneficial and effective in supporting vocabulary development, regardless of the educational level, research design, or setting. Such convergence in the findings provides strong evidence for the significant role of crossword puzzle games in students' vocabulary development.

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