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The Use of Digital Crossword Puzzle for Vocabulary Learning Media: Primary School Teacher's Voices

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*Theresa Ratu Kuncoro, Zainul Aminin[ab]
[12]Universitas Negeri Surabaya, Indonesia.
Corresponding Author: theresa.rku@gmail.com

A B S T R A C T

Vocabulary mastery is a fundamental aspect of English learning, especially for primary school students, as it supports the development of listening, speaking, reading, and writing skills. To address vocabulary learning challenges, educators can employ engaging interactive media, such as digital crossword puzzles. This qualitative study explores primary school English teachers from a private school experienced regarding the implementation of digital crossword puzzles for vocabulary instruction with their perspectives. This study employed a qualitative research design. Data were collected through questionnaires and interviews. The findings reveal that teachers used different types of digital crossword puzzles, namely picture-based and oral-based digital crossword puzzles. The results indicate that digital crossword puzzles enhance students' engagement, motivation, and vocabulary comprehension through interactive and modern features. However, teachers also encountered challenges, including school policy limitations, preparation difficulties, and cost-related constraints. These findings offer practical insights for integrating digital tools into early language education.

Keywords: *Digital Crossword Puzzle, Vocabulary Learning, Teacher's Voices, Primary School, Learning Media.*

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INTRODUCTION

Vocabulary is an essential component of English learning. It plays a crucial role in improving students' abilities in four language skills: listening, speaking, reading, and writing. A well-developed vocabulary allows pupils to form coherent sentences, improves communication skills, and aids in the effective acquisition of other language abilities (Dewi & Syahuma, 2022). Mastering vocabulary is important for learning English, particularly for young children, because it encourages cognitive development. Children with a big vocabulary are better able to communicate and comprehend the language, both of which are essential for academic success (Agazzi, 2022).

In primary school, EFL learners often acquire a smaller vocabulary than native speakers, due to limited exposure and use of English outside of the classroom. EFL learners can comprehend and retain a specific set of vocabulary items, but their overall vocabulary size persists small often few hundred words after the first few years of learning (Meisani, 2023). To overcome this problem, teachers should explore innovative teaching strategies that actively involve students in the learning process.

Teachers can utilize game strategies to create a teaching and learning process that is enjoyable and easy for pupils to understand. Beyond facilitating traditional teaching methods, digital technology allows for innovative ways such as game-based learning. Game-based learning provides an entertaining and efficient platform for language skill development by combining engaging games with instructional content (Kazu & Kuvvetli, 2023). Teachers may adapt game components to individual student skills, making learning more accessible and entertaining for all students. Students could expand their vocabulary through activities such as employing words in discussions and doing crossword puzzles.

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Digital technology's integration provides flexibility, interactivity, and dynamic communication, which improves the entire learning experience (Kodrle & Savchenko, 2021). When connected with digital technology, crossword puzzles further enhance traditional teaching techniques by giving a more dynamic and accessible learning experience. A digital crossword puzzle is an internet-based puzzle game in which students use clues to fill in or find the proper words in a grid. Students actively participate in learning by filling in the grids depending on the clues provided, which helps them grasp their vocabulary (Kubala, 2023). Digital crossword puzzles are a very interesting and pedagogically efficient form of vocabulary development for young learners.

In addition, previous research has examined the use of crossword puzzles as a learning tool in a variety of educational settings. For example, A'yunin (2023) investigated teachers' perspectives on integrating crossword puzzle games in higher education, providing insights into the obstacles and pedagogical concerns involved. Research by Shohib (2024) concentrated on a specific group of students, demonstrating how crossword puzzles might aid in vocabulary development within a specific demographic. Similarly, Istinaropah (2021) stated that evaluated students' attitudes about crossword puzzle games and their perceived benefits in language development. However, these studies have mostly focused on traditional puzzle formats or certain educational levels, with few distinguishing digitals from non-digital implementations.

Moreover, there is limited research that focuses on digital crossword puzzles for vocabulary development at the primary education level, particularly from the perspective of teachers. This study focuses on English Acquisition teachers that have experienced on using digital crossword puzzle as a strategy for primary students' vocabulary mastery. Specifically, it aims to explore the advantages of digital crossword puzzles and the address common challenges in vocabulary learning on students' vocabulary acquisition

Teacher's Voices

Some researchers define the teacher's voice more broadly as expressing the teacher's thoughts and views. Furthermore, Gyurko (2012) stated that the teacher's voice expresses teachers' knowledge or thoughts on their work at school. A teacher's voice is defined as their perspectives and experiences in education. It signifies that the teacher's speech is based on their experiences or perspectives gained while teaching in school. Frost (2008) defines teacher voice as the views, experience, and perspective of teachers on educational policy and practice, emphasizing the essential role educators play in influencing the educational environment.

Teaching and Learning Media

According to Arsyad et al. (2024), media can be classified into three categories. Visual media include images, realia, maps, miniatures, graphics, digital crossword puzzles, and posters. It helps learners understand abstract topics, improve recall, and increase engagement through visual stimulation. Second, audio media. Audio media are instructional items that transfer information solely through sound and do not require visual input. These often include radio broadcasts, cassette recorders, podcasts, and tape recorders. Third, audio-visual media. Audio-visual combines sound and visual components, allowing students to see and hear the same information. Television shows, educational videos, movies, animations, and interactive multimedia are some common examples. According to the explanation above, the researcher uses visual media, namely a digital crossword puzzle.

Teaching Vocabulary by Using Crossword Puzzle Games

Teaching vocabulary is critical for language development since languages are built on words. By creating a list of terms that your students should be familiar with, a digital crossword puzzle can be used as a learning medium and tool in the learning process to sharpen students' minds by filling in the answers to construct a word. Even human communication relies on words. Games are one way for teaching vocabulary. Games can also help children enhance their vocabulary. According to Anwar (2018) games are ways for convincing learners

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that certain words are useful and worthwhile. Several games may be used in the teaching and learning process. Crossword puzzles are one form of game. Students can acquire new terms and expand their vocabulary by doing crossword puzzles.

A study by Kruawong & Soontornwipast (2021) offered five methods for presenting crossword puzzle in class. First, the teacher gives each student the same crossword puzzle. Second, students work independently to solve puzzles with displayed hints. Third, the teacher divides the class into groups, assigns a different crossword puzzle to each group, and instructs them to solve the puzzles together. Fourth, the teacher assigns a crossword puzzle to each student to complete separately before splitting the class into groups so that students can share their solutions and finish the puzzle together. Finally, the teacher draws the crossword problem on the blackboard and gives oral directions before completing it with the entire class step by step. After then, the class is divided into groups, and each group writes on the chalkboard to complete the missing words. Crossword puzzle activities in the classroom can assist children enhance their vocabulary.

Digital Crossword Puzzle

A digital crossword is an interactive version of the non-digital crossword puzzle, presented through electronic platforms such as websites, mobile applications, or educational software. Digital crosswords can be classified in several ways, particularly by format and function. The most basic distinction is between traditional paper-based crosswords and digital versions, the latter of which can be further divided into web-based crosswords, mobile apps, or software-integrated puzzles (Haitami et al., 2022).

A study by Pohloh & Ma'rifatullah (2023) stated that crossword puzzles can be used to teach and learn vocabulary in classrooms. It consists of; first, oral-based digital crossword puzzle. An oral digital crossword puzzle is a sort of vocabulary game in which clues are offered verbally by live teacher voice, audio recordings, or computer speech features, while pupils are only given blank crossword grids. This puzzle type helps auditory learners improve their listening comprehension and memory. Teachers might repeat the information aloud to help students learn and understand. Second, picture-based digital crossword puzzle. Instead of written suggestions, a picture puzzle relies primarily on images for clues. Students interpret the visual content to determine which vocabulary words fit within the crossword puzzle. This style is especially useful for young learners and vocabulary units that include tangible nouns or descriptive subjects. Third, object-based digital crossword puzzle. An object puzzle requires the usage of actual or virtual objects labelled with clue numbers. Students physically or virtually explore areas to locate these artifacts, acquire the clue, and solve the problem. This kind promotes kinaesthetic learning, critical thinking, and student engagement with their surroundings. In digital media, this can be translated into clickable or draggable things in a virtual room or scavenger hunt exercise.

This study explores the lived experiences of English acquisition teachers who have utilized digital crossword puzzles to support primary school students' vocabulary mastery. Specifically, it addresses the following research questions: (1) What types of digital crossword puzzles does the teacher use as a vocabulary learning media? (2) What are the advantages on the use of digital crossword puzzle as a vocabulary learning media? and (3) What are the challenges on the use of digital crossword puzzle as a vocabulary learning media?

METHOD

Research Design

In this study, the researcher conducted a qualitative study to investigate teachers' perspectives and experiences with the usage of digital crossword puzzles as a vocabulary learning media. According to Creswell & Creswell (2017) qualitative research theory, this approach focuses on understanding the meaning that individuals or groups assign to a social or human situation. This argues for an emphasis on context and participants' viewpoints, which is consistent with the goal of this study, to gain in-depth insights from teachers on their

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experiences of digital crossword puzzles in vocabulary learning media. The researcher used a basic interpretative study to analyse the data acquire from teacher interviews. Ary et al., (2013) explains that this method seeks to understand how people perceive their experiences and the meanings they assign to them.

Participants

This study involved five primary school English teachers from a private institution who had direct classroom experience utilizing digital crossword puzzle games for vocabulary instruction.

Instruments

The research instruments used in this study were validated by an expert validator to ensure their appropriateness before being administered to the participants. The researcher used questionnaire and semi-structured interview. The researcher used an open-ended questionnaire as the primary method to collect information from participants.

Data Collection

The data collection procedure included methodical processes to assure the information acquired. First, the researcher created the tools, which contain open-ended questions as the main data collection tool in the questionnaire. Then, the researcher contacted the teachers to ensure that they fit the set criteria and agree to participate in the study. Once consent was secured, the open-ended questionnaires were distributed to the participants for completion. After the participants complete the questionnaire, the researcher carefully reviews their responses for completeness and clarity. If the data acquired from the questionnaire is insufficient or lacking in depth, the researcher conducted semi-structured interviews to gain more complete and detailed information. Following this, the researcher checked any confusing responses by follow-up conversation to ensure that the data accurately reflect the participants' perspectives. Finally, the researcher created the acquire data and began analyse it, with an emphasis on discovering major themes and insights on the usage of digital crossword puzzles for vocabulary learning.

FINDINGS AND DISCUSSION

Types of Digital Crossword Puzzle

Based on the data analysis, the researcher found that four teachers use picture crossword puzzle and one of them used oral crossword puzzle and picture crossword puzzle. The choice is based on the course objectives and the teachers' teaching styles. A picture crossword puzzle depends primarily on visuals for clues. Here are the statement of the reason using picture-based digital crossword puzzle by the participant based on the questionnaire.

> *T2: "Because it is not too complicated, the visuals/ pictures make it easier for children to answer"*
> *T4: "Picture crossword puzzle can visualize the words/ vocabulary to the students"*
> *T5: "Because I teach grades 1 and 2 in elementary school they still need encourages a visual stimulus to motivate them to learn a new vocabulary. The images I use are images that they look in everyday situation, so that when they are able to solve the puzzle, they can move on to the next step in their learning."*

There is also a statement from the participants that consist with a reason based on the interview.

> *T3: "The picture one"*
> *T3: "It is easier for students to re-read the clue several times"*

Based on these findings, the researcher identified four people who used picture-based crossword puzzles. Visual representations help young learners understand word meanings

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better, especially when abstract explanations are difficult for them to process. Furthermore, using visual information helps students minimize their cognitive load. Instead of processing written clues and meanings concurrently, students might use visuals to direct their thinking. These findings support the statement from Hermawan & Prayoga (2022) stated that digital crossword puzzles are activities that can make learning more fascinating and fun while also allowing students to practice and repeat phrase patterns and vocabulary. Picture crossword puzzles can make learning English more interesting by transforming vocabulary acquisition into an entertaining and interactive experience. This strategy teaches pupils to reflect critically on word meanings, spelling, and context.

The researcher also discovered a teacher who used picture and oral crossword puzzles. She used two types since the learning objectives target diverse skills and students benefit from different modes of information. Here is the statement of the reason using picture-based and oral-based digital crossword puzzle by the participant based on the questionnaire.

> *T1: "For picture crossword puzzle it is facilitating the learning objective of "interpreting visual cues. For oral crossword puzzle it is facilitating the learning objective of "acquiring speaking techniques to explain and ask because students need encouragement to speak English"*

Using picture and oral crossword puzzles allows the teacher to combine visual interpretation abilities and speaking exercise, assisting students in developing their vocabulary across several learning modes. Based on the findings, the researcher determined that the majority of the participants used picture crossword puzzles. This is because picture-based hints are easier for young learners to understand, assist pupils in visualizing terminology more concretely, and give significant motivational support through engaging visual stimuli. This statement is in line with Rohmah et al. (2024) it should be accessible across various devices and platforms, providing ease of use for both teachers and students.

Advantages of Digital Crossword Puzzle

Based on the participants responses, the researcher found the advantages of using digital crossword puzzle regarding the teacher's experiences when implementing in the class. The advantages of using digital crossword puzzles can be grouped into three main categories as follows.

First, digital crossword puzzles are easy to use and already supported by the school's technological facilities. Digital crossword puzzles are simple to use and have previously been supported by the school's technology resources such as computers, tablets, or internet access making deployment quick and uncomplicated. Teachers may easily use the platform and students can perform activities on devices they are already familiar with. Here is the statement of the implementation using digital crossword puzzle by the participant based on the questionnaire.

> *T1: "It is effective because it makes children more interested to learn a new word."*

It emphasizes the platform's simplicity, which adds to enhanced student engagement. The exciting and game-like aspect of digital crossword puzzles fosters a fun learning environment, encouraging students to participate actively and inspires them to discover new words. It is support with the statement by Anwar (2018) games are ways for convincing learners that certain words are useful and worthwhile. Several games may be used in the teaching and learning process. Students can acquire new terms and expand their vocabulary by doing crossword puzzles games. As a pre-teaching exercise, students work individually or in pairs on tablets to complete a puzzle including the keywords for the day's reading. This allows students to discover new terms through cues rather than rote memorization, resulting in a cohesive and dynamic start to the course.

Second, digital crossword puzzle is interactive and attract students' engagement in modern appeal. Digital crosswords puzzle provides a more diverse and visually appealing learning experience than traditional paper-based worksheets. Students enjoy vocabulary

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learning more because of their interactive features, which include clickable boxes, automatic checking, voice clues, and animated responses. Here are the statements of the implementation using digital crossword puzzle by the participants based on the questionnaire.

> *T2: "Children are encouraged to understand and guess new words in a more enjoyable way."*
> *T4: "DCP help students learn vocabulary interactively. There are many features that can be used to increase students' attention to learn."*
> *There is also a statement of implementation from the participants based on the interview.*
> *T3: "It is encouraging students to think about the intended word."*

It is related to statements by Rahini et al. (2024) this convenience encourages more regular engagement, which can lead to longer-term cognitive improvement. Unlike traditional paper puzzles, digital versions can be played on a variety of devices, allowing users to interact with them at any time and from anywhere. Teachers can use the track progress option to improve formative assessment. For example, while students are solving a puzzle during a rotation exercise, the teacher can use a live dashboard to determine which clues are providing the greatest difficulty.

Third, digital crossword puzzle can create teachers own-creativity. Teachers can quickly create their own crossword puzzles using the offered templates, which allow them to tailor vocabulary sets, themes, and difficulty levels. This flexibility allows teachers to match crossword material to instructional objectives, existing units, or specific learning outcomes. Here is the statement of the implementation using digital crossword puzzle by the participant based on the questionnaire.

> *T5: "DCP can stimulate students' vocabulary comprehension. Many words will be revealed from the pictures they open, which will certainly add to their new vocabulary."*

Teachers do not have to design learning media from the beginning; instead, they can efficiently adapt ready-made templates by adjusting vocabulary content, topics, and difficulty levels to meet students' competence levels and learning goals. This finding aligns with Lestari & Yulia (2018) that discovered teaching with crossword puzzles was an excellent strategy for improving students' vocabulary mastery. The puzzles not only enhanced student enthusiasm, but also gave repeated exposure to new terminology in a relevant context, thereby improving the learning process's effectiveness and memory while the teacher also creates the creativity of a learning media to teach.

Challenges of Digital Crossword Puzzle

Based on the participants responses, the researcher found the challenges of using digital crossword puzzle regarding the teacher's experiences when implementing in the class with. The challenges of using digital crossword puzzles can be grouped into three main categories as follows.

First, school policy limitations. One difficulty comes from school policies, such as the establishment of "No Gadget Day," which limits the usage of digital gadgets in the classroom. This policy limits instructors' ability to include digital media and forces them to modify lesson plans to direct learning over technology-based activities. Here is the statement of the participants based on the questionnaire.

> *T1: "School sometimes implements "No Gadget Day" which is minimizing the use of gadgets or digital media and focusing more on direct interaction."*

Teachers can use different strategies. During "No Gadget Day," digital crossword puzzles can be printed or used as teacher-led activities presented on LCDs, ensuring that learning objectives are satisfied while following to school policies. This finding is in line with Suciningrum et al. (2019) as educational technologies advance, including adaptive learning

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capabilities into digital crossword applications may help to customize vocabulary instruction by delivering unique challenges that are tailored to each student's pace and needs.

Second, preparing learning media has some difficulties. Teachers encountered challenges in developing effective learning materials. These are the statement of the participants based on the questionnaire.

T2: "Writing the clues/ riddles that is easy for children to understand"
T4: "Preparing and providing differentiation learning model of DCP based on students' abilities. Teachers prepare several crossword models tailored to each student's abilities."
T5: "Sometimes there are crossword puzzles that are not very interesting for children"
There is also a statement from the participants that consist with a technical problem based on the interview.
T3: "It really had to be done manually because the options for AI were not as abundant back then as they are now"

Teachers face pedagogical problems when preparing digital crossword puzzles. Teachers must put in extra time and effort to developing clear and age-appropriate clues, as well as designing varied puzzles to accommodate students' varying abilities. It is related to the statement of Haitami et al. (2022) that the most basic distinction is between traditional paper-based crosswords and digital versions, the latter of which can be further divided into web-based crosswords, mobile apps, or software-integrated puzzles. They may serve different purposes some focus on general vocabulary development, while others target subject-specific terminology or language skills such as synonyms, antonyms, or spelling. To handle the workload, teachers can use collaborative clue-building. In this activity, students are divided into small groups and assigned a certain chapter from a textbook. Each group is in charge of creating three riddle-style hints for a common class puzzle. The teacher then organizes them into a single digital template

Third, digital crossword puzzle has some cost-related constraints. Designing fully personalized puzzles frequently necessitates access to premium services, which means teachers must pay a subscription fee, which can be prohibitively expensive for some teachers. Here is the statement of the participants based on the questionnaire.

T5: "When we want to make our own design, we have to pay for a premium account."

As a result, even the teachers understand the instructional usefulness of digital crossword puzzles, they may be unable to fully capitalize on their potential. The necessity to pay for premium access may also inhibit teachers from trying out more innovative or varied learning activities, limiting classroom creativity. The findings support the statement from Oktorinna et al. (2022) that is one big risk is the possibility of technological difficulties, compatibility issues between apps. During planned teacher's meeting hours, the school may organize a tech-sharing workshop. In this activity, a teacher who has mastered a particular digital puzzle tool teaches others how to utilize the school-funded version to generate ad-free, subject-specific content.

CONCLUSIONS

This study found that digital crossword puzzles provide an engaging and enjoyable experience for teaching vocabulary to primary school students. Teachers used two types: picture-based and oral-based puzzles. Picture-based puzzles were more popular because visual clues help young learners understand and visualize vocabulary while reducing confusion. Oral-based puzzles also supported speaking practice and encouraged students to ask questions in English. Digital crossword puzzles offer several advantages. They are accessible through familiar digital platforms, interactive, and adaptable to students' learning objectives, vocabulary topics, and proficiency levels. They also encourage teachers to create more personalized learning activities. However, challenges include school policies such as "No Gadget Day," difficulties in preparing learning materials, and additional costs for

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premium platform features. Overall, digital crossword puzzles can support vocabulary learning while creating a more engaging and enjoyable classroom environment. Despite limitations related to preparation, school policies, and costs, they remain a useful teaching medium for young learners.

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DECLARATION

Author Contributions: All authors actively participated in the completion of this study, with individual contributions based on their respective expertise. Their roles covered the development of the research content, statistical and data analysis, English language review, and manuscript preparation. All authors contributed to reviewing and approving the final version of the manuscript.

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