

## THE EFFECTIVENESS OF PUZZLE MEDIA IN TEACHING CAUSE-AND-EFFECT SENTENCES TO EFL LEARNERS IN INDONESIA

by

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**Abstract:**

Effective writing instruction is crucial for EFL learners. Nonetheless, teaching cause-and-effect sentences remains a challenge. The current study aims to examine the effectiveness of puzzle media in addressing this challenge. The study employed a pre-experimental, pre-test/post-test design with one group of participants comprising Indonesian high school students. Specifically, this group underwent a pre-test, instructional treatments using puzzle media, and a post-test, along with a questionnaire. The pre-test and post-test were intended to gauge the effectiveness of puzzle media on cause-and-effect sentences as reflected in the participants' ability to use these constructions before vs. after receiving the instructional treatments, whereas the questionnaire was intended to explore their views of the given instructional treatment. The data, comprising the participants' scores on the pre-test and post-test, were analysed using a paired-sample t-test. Results reveal a significant difference between pre-test and post-test scores, indicating that puzzle media is effective in teaching cause-and-effect sentences to EFL learners. Furthermore, the analysis of the participants' responses on the questionnaire indicates that 62.1% of participants found puzzle media engaging and helpful in writing tasks. This study concludes that incorporating puzzle media into EFL writing instruction can enhance learners' mastery of cause-and-effect sentences and foster a more engaging learning experience.

**Keywords:** cause-and-effect sentences, puzzle media, teaching writing skills

**Abstrak:**

Instruksi menulis yang efektif sangat penting bagi pelajar Bahasa Inggris sebagai Bahasa Asing (EFL). Meskipun demikian, mengajarkan kalimat sebab-akibat tetap menjadi tantangan. Studi saat ini bertujuan untuk mengkaji efektivitas media puzzle dalam mengatasi tantangan ini. Penelitian ini menggunakan desain pra-eksperimental, pra-tes/pasca-tes dengan satu kelompok peserta yang terdiri dari siswa sekolah menengah Indonesia. Secara khusus, kelompok ini menjalani pre-test, perawatan instruksional menggunakan media teka-teki, dan post-test, bersama dengan kuesioner. Pra-tes dan pasca-tes dimaksudkan untuk mengukur efektivitas media teka-teki pada kalimat sebab-akibat seperti yang tercermin dalam kemampuan peserta untuk menggunakan konstruksi ini sebelum vs. setelah menerima perawatan instruksional, sedangkan kuesioner dimaksudkan untuk mengeksplorasi pandangan mereka

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*tentang perlakuan instruksional yang diberikan. Data, yang terdiri dari skor peserta pada pra-tes dan pasca-tes, dianalisis menggunakan uji-t sampel berpasangan. Hasil mengungkapkan perbedaan yang signifikan antara skor pra-tes dan pasca-tes, menunjukkan bahwa media teka-teki efektif dalam mengajarkan kalimat sebab-akibat kepada pelajar EFL. Selanjutnya, analisis tanggapan peserta pada kuesioner menunjukkan bahwa 62,1% peserta menganggap media teka-teki menarik dan membantu dalam tugas menulis. Studi ini menyimpulkan bahwa memasukkan media teka-teki ke dalam instruksi penulisan EFL dapat meningkatkan penguasaan pelajar terhadap kalimat sebab-akibat dan menumbuhkan pengalaman belajar yang lebih menarik.*

**Kata kunci:** *kalimat sebab-akibat, media teka-teki, mengajarkan keterampilan menulis*

English writing ability for students is one of the most important skills in learning English, where students are expected to be able to produce and convey their ideas coherently. The cause and effect sentence in English is one of the text types studied by students, where the pattern in writing this sentence is considered a little complicated because it not only pays attention to grammatical forms, but also requires logical and critical thinking skills to write this sentence. With this demand, the majority of high school students have difficulty in composing cause and effect sentences, which is motivated by limited vocabulary, lack of learning motivation, and lack of learning media facilities that are attractive to students (Hidayat & Praseno, 2021; Kurniawan & Styati, 2023).

Deep mastery of grammar, vocabulary, and cohesion simultaneously is a challenge that needs to be overcome when learning to write using a foreign language; therefore, the most challenging literacy skills are writing skills (Bell & Burnaby, as cited in Gienovita Anggraeni & Dahlan Rais, n.d.). In Indonesian EFL (English as a Foreign Language) classes, there are still many students who have difficulty in expressing their ideas in a structured and understandable form of writing, especially when writing cause and effect sentences (Suryadi et al., 2024). Aini et al. (2022) revealed that in the process of composing cause and effect sentences, students still often experience difficulties, especially in terms of sentence construction, linking ideas, and using grammar. Of course, this requires a certain learning method, which is the most commonly taught method that focuses on textbooks, and this method is not suitable for all students' learning styles (Mustain et al., 2022).

The problem factors experienced by high school students in writing cause and effect sentences gave rise to an idea where educators provide solutions in the form of using interactive and interesting media to overcome these problems. The media innovation that will be integrated

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into this writing lesson is the use of puzzle-based media. The effectiveness of this puzzle media has been proven to be able to overcome the problems experienced by high school students in writing cause and effect sentences, where the process of using it is proven to increase student learning motivation, vocabulary mastery, literacy, and problem-solving skills (Biantong et al., 2023; Weng, 2022; Yuliastutik et al., n.d.). The factor that causes puzzle learning media to be able to provide a fun and challenging learning atmosphere is that this media can increase students' interest in learning and minimize anxiety when writing sentences (Fitria, 2023; Safitri & Suryadi, 20235).

Furthermore, the use of puzzle media in the learning process is proven to be able to improve student learning outcomes in various subjects, as several previous articles have proven. Biantong et al. (2023) Noted that the use of puzzle media in the learning process increases the learning motivation of elementary school students, which is in line with the academic achievement of these students as well. In addition to the increased motivation experienced by students in using puzzle media in the learning process, (Wulan N. et al., 2021) revealed that puzzle media can hone students' critical thinking. The use of word-based puzzle media such as crosswords and word search has proven effective in sharpening and improving student memory when the use of this puzzle media is used in the context of learning English (Fitria, 2023; Safitri & Suryadi, 20235).

In terms of students' learning outcomes and their participation in the learning process, it is proven that the digital media platform, Edpuzzle, is able to provide good results, especially in the context of learning to write, where the learning model is a flipped classroom model (Hidayat & Praseno, 2021). On the other hand, the involvement of video-based learning media in Edpuzzle is beneficial to improve students' writing skills at the junior high school level (Khuluq & Aminin, 2024).

In addition to digital puzzle media such as Edpuzzle, another type of puzzle that innovates into a digital-based puzzle is the jigsaw puzzle, where this model is similar to the jigsawGAN. The results of using jigsaw puzzle media in the learning process have the potential to provide positive results, where students can easily show their potential in increasing spatial thinking and information retention (Kovačević et al., 2024). The resulting cognitive abilities are

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certainly very suitable for what is needed in the context of academic writing, including the process of writing cause and effect sentences. This finding is also supported by the combination of learning models that will improve concept understanding and student learning outcomes, namely the combination of problem-based learning models and puzzle media (Indrasari et al., 2023)

Apart from the many studies that have discussed the impact of using puzzle media in the English language learning process, there are still very few that discuss the impact of this puzzle media in learning English for high school students whose focus is writing cause and effect sentences. Moreover, while many studies focus on puzzle-based learning in vocabulary or grammar, limited research has addressed its use in teaching cause-and-effect writing in senior high school EFL contexts. Thus, the research aims to find out how the effectiveness of this puzzle learning media in writing English cause and effect sentences. This research also explores how students' perspectives on using puzzle media to increase their interest and understanding of writing English cause-and-effect sentences. In keeping with the research emphasis, the research question concerns the usefulness of puzzle-based learning media in increasing students' capacity to build cause-and-effect sentences.

To this end, the current study addresses two research questions: (1). Does the use of puzzle media significantly improve EFL learners' ability to construct cause-and-effect sentences in writing? (2). What are EFL learners' perceptions of the effectiveness of puzzle media in teaching cause-and-effect sentences?

## METHOD

### Design

This study used a quantitative pre-experimental design with one group pre-test and post-test model. The focus of this research is to investigate how the effectiveness of using puzzle media as a treatment improves students' ability to write cause-and-effect sentences. Students' ability to compose cause and effect sentences is an operational variable in this study, where the measurement of students' abilities is seen from before the treatment activity using puzzle media and after the treatment.

**Participant**

The participants of this research are 11th-grade students of IPS 2 SMA BIMA Ambulu. The reason why these students were chosen as research subjects is that students have learned the structure of English writing, and were studying cause and effect material when this research process took place in the even semester 2024/2025, so all students in grade 11 are considered capable of learning how to write the correct cause and effect sentences. All students in class 11 IPS 2 will also take the pre-test, post-test, and fill out a questionnaire at the end of the study.

**Instruments**

The research instruments used by researchers are writing tests and questionnaires, which are designed to measure students' cause-and-effect sentence writing skills and their perceptions of puzzle media.

**Writing Test**

This test was designed into two stages: pre-test and post-test. The pre-test and post-test had different numbers of questions, but the content of the questions was almost the same. The pre-test questions amounted to seven questions, and the post-test questions amounted to two dozen questions, where the seven questions were repetitions of the pre-test questions. The type of questions attached contains several keywords and pictures that can help students form perfect cause-and-effect sentences. The assessment itself is done by looking at the sentences that are presented must have a subject, predicate, and object structure.

**Student Questionnaire**

The questionnaire was given at the end of the research session after the post-test activity, which aims to see students' perspectives on the use of puzzle media in the context of writing case-and-effect sentences. The questionnaire was adapted from a previously validated instrument consisting of three main statements and three accompanying statements, which students could fill in using a Likert scale, from number one, which means strongly disagree, to number five, which means strongly agree. The statements in the questionnaire cover aspects of interest, enjoyment, and motivation.

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To ensure the accuracy of the questionnaire in this study, as a research tool, its validity and reliability were also tested empirically. The validity measurement shows whether the questionnaire effectively measures the construct over time. Meanwhile, the reliability of the questionnaire items was also evaluated using Cronbach's alpha, a statistical method commonly used for internal consistency analysis. A Cronbach's alpha value above 0.70 in research methodology literature indicates acceptable reliability, with higher values indicating stronger consistency among the items.

The use of these two instruments is intended so that the data obtained by the researcher covers both objective and subjective aspects, thus providing a thorough and comprehensive picture of the effect of puzzle media on learning to write cause-and-effect sentences.

### **Data collecting technique**

Data collection techniques carried out for this study were carried out in three meetings. First meeting, students were asked to work on pre-test questions totalling seven questions. Where each problem has been given a description of the picture and some keywords (for example, a picture of a student having a stomach-ache, then given a number of words “Boy - stomachache - ate many snacks”). In each picture, students are asked to write a cause-and-effect sentence based on the question instructions that have been listed. The pre-test was conducted within ten minutes and aimed to measure students' initial ability in writing cause and effect sentences in English.

Second meeting, the researcher conducted a treatment process to hone students' thinking skills in constructing cause-and-effect sentences. Students will be divided into six groups, where each group has been given several sets of pictures containing cause and effect sentences, and the pictures given consist of several sets of randomized pictures. Each set of puzzles will explain one cause-and-effect sentence that will be written by the researcher (for example, in one set of pictures, there is a picture of a student studying and another student who got a high score). On the blackboard, the researcher will write the cause-and-effect sentences one by one using different conjunctions. Each sentence will only be given thirty seconds, and students are asked to analyse and find a set of pictures that match the cause-and-effect sentences on the

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board. This process ended with feedback given by the researcher on each cause-and-effect sentence that had been answered with a set of pictures.

Third meeting, the same treatment as the second meeting was carried out, namely using puzzle media as a medium to support students' understanding in understanding cause and effect sentences. However, at this third meeting, students were asked to analyse several sets of puzzle pictures individually. After that, students were asked to work on post-test questions, totalling twelve questions, where seven questions on the post-test were the same as the pre-test questions, while the other five questions were new questions to test students' advanced understanding. At the end of the session, students were asked to complete an online questionnaire to see their perceptions of the use of puzzle media and reflect on their learning experience in learning to write cause and effect sentences.

### **Data analysis technique**

The data analysis technique carried out in this study aims to answer the research question that has been presented in the introduction. The data analysis process itself is carried out in two ways. First, the results of the pre-test and post-test worksheets will be assessed. The criteria for assessing student answer sheets are assessed from the percentage of all question items answered by students with complete sentences in which the subject, predicate, and object are included. In the second step, the results of the assessment will be compared using the Paired Sample t-Test technique. The purpose is to find out whether puzzle learning media is able to improve students' ability significantly, as seen from the difference in the scores they get in the pre-test and post-test.

## **RESULTS AND DISCUSSION**

### **Results**

The students took a test to write a series of cause and effect sentences with different numbers of questions (see Table 1).

| <b><i>Table 1. Descriptive statistics for the writing test</i></b> |                           |
|--------------------------------------------------------------------|---------------------------|
| <i>Test</i>                                                        | <i>Experimental Group</i> |

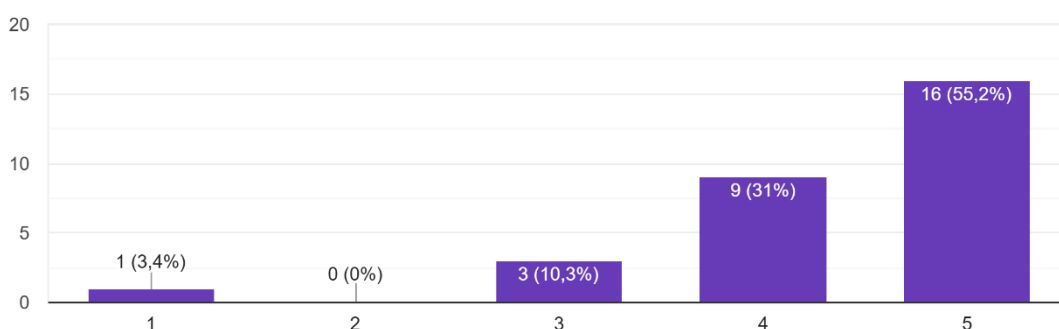
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|                  | <i>M</i> | <i>SD</i> | <i>n</i> | <i>Max</i> | <i>Min</i> |
|------------------|----------|-----------|----------|------------|------------|
| <i>Pre-test</i>  | 12.78    | 18.43     | 29       | 57.1       | 0          |
| <i>Post-test</i> | 72.1     | 25.13     | 29       | 100        | 25         |

Notes: M = mean scores, n = number of participants, SD = standard deviation, Max = maximum scores, Min = minimum scores

The pre-test and post-test results showed different averages, where the pre-test mean score was  $M = 12.78$  ( $SD = 18.43$ ), the minimum score was 0, and the maximum score was 57.1. Based on this score, it is indicated that students, before being given treatment, have difficulty in writing cause and effect sentences. While the average score of the post-test was 72.1 ( $SD = 25.13$ ), the minimum score was 25 and the maximum score was 100. The results of the independent sample t-test showed a difference between the two groups during the pre-test,  $t = -10.251$ ,  $p = <0.001$ ,  $df = 51.353$ . The negative t-value, which is less than 0.001, indicates that, based on a significance level of 0.05, there is a statistically significant difference between the pre-test and post-test scores.

I find the puzzle game activities that have been implemented in English learning interesting .  
29 jawaban



**Figure 1. Students' perceptions of learning cause-and-effect sentence through puzzle media**

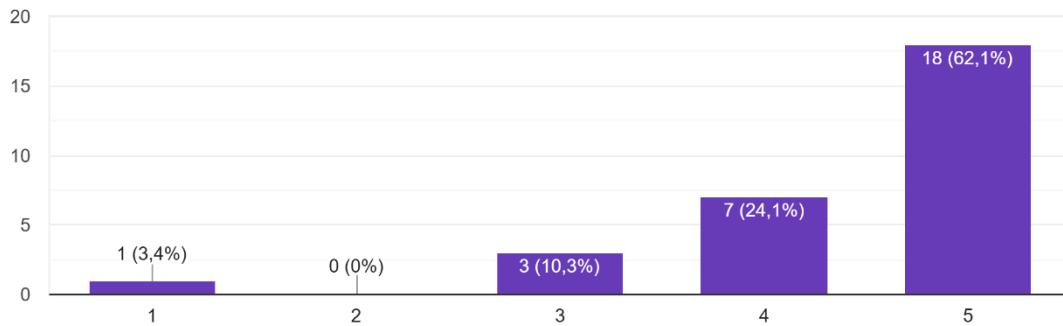
The survey results based on students' perspectives after using puzzle media in the cause-and-effect learning process showed a very good response, where 16 out of 29 students or 55.2% stated that the implementation of puzzle media in the context of writing cause-and-effect

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sentences had an effect on students' interest in cause-and-effect material.

I enjoy playing puzzle games during English learning.

29 jawaban

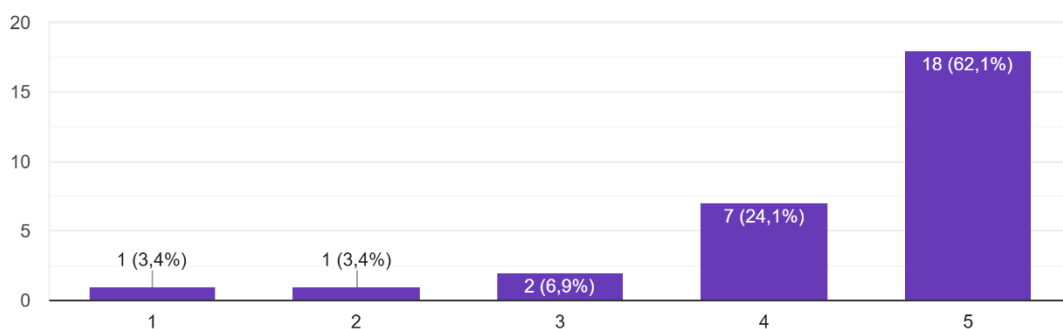


**Figure 2. Student's enjoyment of puzzle games during English lesson**

The survey results based on students' perspectives after using puzzle media in the cause-and-effect learning process showed a very good response, where 18 out of 29 students or 62.1% stated that students felt happy with the learning process using puzzle media in the context of writing cause-and-effect sentences.

Overall, I feel that learning activities like this motivate me .

29 jawaban



**Figure 3. Students' Motivation through Puzzle-Based Learning Activities**

The survey results based on students' perspectives after using puzzle media in the

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learning process of cause and effect showed a very good response, where 18 out of 29 students or 62.1% stated that learning by using puzzle media motivated them in the learning process.

This finding confirms that the potential use of puzzle media not only has a positive impact on students' cognitive abilities, which provides an interesting and effective experience for students, especially in improving students' cause and effect sentence writing ability, but also has a positive impact on the aspect of their learning motivation.

## **Discussion**

### ***Key Findings (RQ1 – Improvement of Writing Ability)***

The findings of this study indicate that there was an improvement in students' ability to write cause and effect sentences after the application of puzzle media. From the statistical analysis that has been carried out, it can be seen that there is significance when viewed from the average pre-test and post-test scores obtained by students. The average score of students showed an increase from the initial average of 12.78 to 72.1 at the end of the test. From the findings, it can be concluded that there was a significant increase in scores for the use of puzzle media, which proved to be effective in improving students' ability to construct cause-and-effect sentences.

### ***Effectiveness of Puzzle Media in Enhancing Writing Skills***

The considerable increase in the average scores of students' pre-test and post-test indicates that the use of interactive puzzle learning media has a significant impact on improving students' English writing skills. Mastery of the cause-and-effect sentence structure certainly cannot be separated from several supporting factors. In line with previous research that puzzle media is an interactive and interesting medium, whose use in the learning process will help students in the success of writing a second language, such as fostering great student learning motivation, sharpening critical thinking, and strengthening vocabulary (Rajendran et al., 2025). In addition, the feedback delivered by teachers when learning using effective interactive game-based media will enable students to get timely instructions, overcome doubts, and learn and understand the language needed to communicate effectively (Rajendran et al., 2025).

### ***RQ2 - Student Motivation and Engagement***

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The results of the questionnaire filled out by students after the post-test activity showed 55,2% of students strongly agreed that learning using puzzle media was interesting, where 62,1% stated that this media attracted students' motivation to learn to write English. This indicates that the involvement of puzzles in learning to write English creates a high level of creating a fun learning atmosphere. This is in line with self-determination theory, which states that a significant increase in learning outcomes is influenced by fun factors in the learning environment, interest, and intrinsic motivation (Erylmaz & Boicu, 2023). The way students think and their engagement in the learning process are some of the consequences when students feel that the learning activities they do have their own meaning and are fun. This is in line with a recent study, which shows that increasing students' motivation and engagement in learning will lead to improved learning outcomes in language acquisition, which is greatly influenced by fun learning environments such as game-based learning (Sugianto, 2023). Moreover, students' commitment to engagement in the learning process, deep understanding, and sustained motivation in learning are tangible effects that arise when educational environments use gamification elements (Sugianto, 2023; Zulhemay et al., 2024).

***Cognitive Benefits and Active Learning***

Puzzle media also contributed to higher-order cognitive processes. According to Bloom's Taxonomy, activities that require students to synthesize, apply knowledge, and synthesize are high-level cognitive skills, which are all a series of puzzle-based learning activities (Nafiati, 2021). The encouragement of active, interactive learning and the process of deep understanding of the cause-and-effect sentence structure is the result of the collaborative and competitive elements in group puzzle activities. In line with previous findings, the use of puzzle media or the use of game media in the learning process strengthens critical thinking, memory retention, and strengthens thinking solving skills (Zulhemay et al., 2024). Multimodal input can support language production and understanding of complex language structures with the use of visual aids (pictures paired with keywords). According to Mayer's Cognitive Theory of Multimedia Learning, a dual-channel approach (auditory and visual) supports the selection, organization, and integration of information in working memory with the help of learning media that combine words and images rather than words (Mayer, 2002, 2005).

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The use of media that involves students' ability to construct cause-and-effect sentences with the help of keywords and pictures is a form of a scaffolded problem-solving approach. Students will analyse the logical relationship between keywords and pictures to reflect the relationship “X causes Y” in constructing coherent and logical cause-and-effect sentences. The impact of this puzzle media changes abstract grammatical concepts and then reassembles cause and effect sentence pieces that internalize syntactic relationships, then reflected in more complex writing. In line with basic cognitive theory, Cognitive Load Theory from (Sweller, 2011) states that the role of visual aids and keywords is a support students in reducing irrelevant mental load, so that complex sentence formation can be focused based on existing cognitive resources.

***Reducing Student Writing Anxiety***

The puzzle media facility in learning to write cause and effect in English will help students in creating a low-stress and supportive learning atmosphere. Students' lack of confidence in their foreign language ability is a common obstacle to writing tasks using a foreign language, which will certainly have an impact on the aspect of writing anxiety among students. Recent research provides evidence that a gamification-based learning process will create a learning environment that is fun, comfortable, and can significantly reduce anxiety in the learning process (Zulhemay et al., 2024).

(Sugianto, 2023) also notes that the gamification-based learning process will also have a domino effect on the enjoyable learning atmosphere in terms of increasing students' enjoyment and sense of accomplishment, both of which are essential for reducing anxiety and fostering a positive sense of learning. Reducing students' anxiety and building students' confidence in writing causal sentences that require rationality are the effects produced when the interactive and immersive nature of the puzzle media itself is gamified. Building confidence will reduce anxiety by utilizing the interactive and immersive nature of puzzle media that provides immediate feedback and fosters a sense of accomplishment.

***Collaborative and Individual Activities Opportunities***

The integration of both group and individual interactive learning in the use of puzzle media provides opportunities for collaborative learning and independent practice. The learning

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process carried out in groups allows students to exchange ideas and build sentence meaning together, while the learning process carried out individually allows students to think critically and take responsibility for their own learning process. The process of working on puzzles that combines group and individual approaches is supported by research that shows that the process of solving puzzles carried out in groups will strengthen social interaction and language development, while if carried out individually, it will strengthen students' understanding of the topic (Falah et al., 2024)

(Falah et al., 2024) emphasizes that the process of working on tasks that combine group and individual approaches will maximize learning outcomes. Peer support, knowledge sharing, and joint problem solving are the benefits that students will get when the assignment process is carried out in groups. Meanwhile, the process of working independently will provide opportunities for each student to practice, reflect, and provide personalized feedback. This combination of group and individual approaches is believed to benefit students' social and cognitive development processes simultaneously.

## **CONCLUSION AND IMPLICATION**

### **Conclusion**

Based on the results of the research and discussion that has been done, it can be concluded that puzzle media effectively improves students' ability in writing cause-and-effect sentences. The increase from the pre-test and post-test results indicates that the use of puzzle media has a positive impact on students' understanding of sentence structure, vocabulary mastery, and into understanding of sentence structure, vocabulary mastery, and the ability to analyse critically.

The use of puzzle media not only helps students in the logical thinking process, but its use is able to creates a fun learning environment, reduce students' anxiety about anxiety about the use of foreign languages in writing, and increase students' motivation and participation in learning foreign languages. participation in learning a foreign language. The collaboration of individual and group learning approaches will help students to students build social meaning and strengthen students' understanding of the material through independent practice. through

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independent practice. This is in line with learning theory constructively and cognitive learning theories that emphasize active involvement in social interaction and multimodal information processing. social interaction and multimodal information processing.

Thus, puzzle media is suitable to be used as an alternative media in the learning process of writing, especially in learning to write cause and effect sentences in English.

### **Limitation**

This research was only conducted with one group, a particular generation group and was only conducted in one class. The duration of the research process was also only conducted in three meetings, which is relatively short. Future research is expected to explore more about the long-term effects of using puzzle media in its application in the context of English education.

### **Implication**

The results of this study have a number of important implications for the practice of teaching foreign language writing. First, that the use of puzzle media in the English language learning process to improve students' writing skills in writing cause and effect sentences makes the learning process more interesting, reduces anxiety, and improves the processing of sentence structures to be more complex. The role of the teacher is to adapt this media according to the needs of each class, both in digital and conventional forms.

Secondly, the results of this study highlight the use of a multimodal approach, which adopts a combination of visual and verbal elements to support comprehension. With the option of multiple pathways for students to process information, teachers can adopt a variety of learning styles.

Thirdly, it is important to emphasize a supportive and pressure-free learning environment for students, where the use of puzzle media can build self-confidence and a positive attitude towards writing. Lastly, the blended learning process by combining group and individual activities tends to be effective in improving the ability to write cause and effect sentences, teachers should collaborate these two activities so that students can benefit from social interaction and personalized feedback.

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