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Enhancing Students' Learning Interest and Conceptual Understanding in Sociology: Using the Analogy Method and Canva Infographic Media

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ABSTRACT

This study evaluates the effectiveness of combining the analogy method with Canva infographics to enhance conceptual understanding and student engagement in Sociology learning, a subject often perceived as abstract and unengaging. A quasi-experimental one-group pretest-posttest design was conducted with 36 grade XI Sociology 6 students at SMA Negeri 8 Pontianak. Data collection involved pretests, posttests, Likert-scale questionnaires, and observation sheets to assess understanding and engagement. The findings revealed a significant improvement in posttest scores (mean pretest = 62.5; posttest = 81.5; $p < 0.001$). The gain index ($G = 0.5278$) indicated a moderate increase in conceptual understanding, while Cohen's d value of 1.58 reflected a large effect size. The analogy method simplified abstract sociological concepts by linking them to students' real-life experiences, while Canva infographics provided creative and systematic visualizations of complex ideas. This combination also encouraged critical and creative thinking, enhancing student engagement. The study highlights the potential of integrating analogy-based methods with digital tools like Canva to address challenges in teaching abstract subjects. The findings support constructivist and dual-coding theories, which emphasize experiential learning and the integration of verbal and visual information. This research demonstrates that analogy methods paired with Canva infographics significantly improve students' understanding and engagement in Sociology. Further studies should explore the broader applicability of this method across diverse subjects, educational levels, and learning environments.

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1. INTRODUCTION

21st-century educational innovations, such as the use of Canva in sociology learning, play a vital role in developing students' key skills, such as creativity, critical thinking, and collaboration. According to Yuningsih & Susilo (2018), 21st-century learning must involve students actively, not just relying on

memorization. Critical thinking skills, which are very important in education Davies (2013); Gunstone, (2013); Willingham, (2008); Yuruk et al., (2009), can be taught effectively through an approach that involves metacognition and practical application. Using Canva allows students to create engaging presentations, deepen their understanding of sociological concepts, and increase their engagement with the material (Ishartono et al., 2019). In addition, digital applications such as Canva have been shown to increase student collaboration and creativity in social studies learning(Celik, 2021). Nurul Asri (2019) also noted that Canva stimulates critical thinking and supports interactive learning. Digital technology, according to Tillander (2011), challenging the traditional curriculum and encouraging creative exploration. Ennis (1993); Tiruneh et al. (2014) emphasizes the importance of critical thinking skills in everyday decision making, which can be developed through deeper conceptual understanding, as exemplified by Harrison & Gibbons (2013). With its various benefits, this study aims to improve students' critical thinking skills and understanding of the material through the use of Canva in learning.

This study seeks to enhance students' comprehension of abstract and complex concepts by integrating the analogy method with infographic media created through Canva. This approach aims to boost student engagement in the learning process. Sociology education, often characterized by abstract concepts that lack the concrete tools used in subjects like science or mathematics, necessitates a reflective and discursive teaching strategy to foster deeper understanding. Graham et al. (2020) highlight that social studies instruction frequently involves activities such as summarizing and explaining to reinforce students' grasp of the material. The analogy method has proven to be effective in teaching complex concepts by linking new ideas to students' existing knowledge. This strategy not only enhances conceptual understanding but also facilitates the transfer of knowledge to contexts more relevant to students' everyday lives (Tise et al., 2023). Richland et al., as cited in Timonera et al. (2023), emphasize that learning through analogies improves students' memory and understanding while fostering active participation in the learning process. Additionally, Al-dhaimat et al. (2022) assert that analogies can boost learning motivation by creating a stronger connection between students and the material. In the context of sociology, analogies can make abstract social theories more relatable by connecting them to real-life experiences (Shana & Shareef, 2022). Consequently, applying the analogy method not only deepens students' conceptual understanding but also heightens their interest in learning, making it a powerful tool to prepare them for real-world challenges with a more profound grasp of the subject matter.

The use of graphic design platforms such as Canva in learning has great potential to visualize abstract concepts and enhance student creativity. According to İlhan & Şin, (2024); Vargas et al., (2022) Canva offers an easy-to-use interface, allowing the creation of engaging and contextual learning materials, which can enhance students' understanding and motivation. This technology, already part of students' daily lives, also supports an interactive approach that enriches the learning experience (Rinneheimo & Suhonen, 2022). Attractive media designs, such as infographics and presentations that can be created using Canva, have the potential to reduce boredom in the learning process, make it easier to understand the material, and deepen understanding of concepts, both in offline and online learning (Deliana et al., 2023; Fikriyyani & Supriyanto, 2024; Prihantini et al., 2023). Further expressed by Prihantini et al. (2023), visually appealing media can increase student engagement and accelerate understanding of the material. In addition, Deliana et al. (2023) emphasized that audio-visual media created with Canva can enrich multisensory learning experiences, which in turn deepen students' conceptual understanding. Thus, using Canva as a learning medium has proven effective in increasing student interest in learning and achievement.

Learning interest is a crucial factor in increasing student motivation and involvement in learning, including in the context of sociology learning. Learning interest, which includes curiosity, comfort, and active participation, contributes to the creation of a conducive learning environment and supports students' academic success. Research Ricardo & Meilani, (2017) shows that students who have a high interest in the material tend to be more active in interacting with information and participating in class discussions, which leads to increased learning effectiveness. Bai et al. (2022) also emphasized that

learning interest as a major variable in motivation is closely related to increased self-efficacy and self-regulation, which in turn increases student engagement in learning. In the context of sociology learning, it is important for teachers to identify and develop student interests through effective strategies, such as the use of analogy methods and visual media, including infographics developed through platforms such as Canva. Gautam & Agarwal (2023) stated that teaching strategies that can stimulate interest and support student engagement are essential, especially those that connect sociological theories with relevant social phenomena in everyday life. The use of the analogy method allows students to connect new concepts with their existing knowledge, while Canva infographics, with their visual capabilities, help simplify complex social concepts, significantly improving students' conceptual understanding. Therefore, the integration of the analogy method and infographic media in sociology learning not only increases students' interest in learning but also deepens their understanding of social concepts that are often abstract and difficult to understand.

Increasing students' interest in learning and conceptual understanding in sociology learning can be done using the analogy method, which allows students to link new concepts with existing knowledge. This is supported by research, including research on Sadighi, F. & Zarafshan (2006) shows that the application of analogies in learning can improve students' memory and understanding of social concepts that are difficult to understand. Likewise, research Yuningsih & Susilo (2018) that the use of analogies accelerates understanding of complex material by connecting abstract concepts in sociology, such as social structure and social change, with more concrete knowledge. Research Afifah & Umam (2023) also reinforces that analogies help students connect the social phenomena being taught with their real-life experiences, which in turn facilitates students' understanding of the material being taught.

In addition, several studies also show that visual media, such as Canva infographics, can strengthen students' understanding in the context of sociology learning. Research Traboco et al. (2022)revealed that the use of visual media in learning can increase student engagement, clarify abstract concepts, and help them remember information more effectively. Similarly, research Sheikhlar et al. (2022) emphasizes the importance of using visual aids to support conceptual understanding, especially in disciplines involving complex concepts such as sociology. Research Serevina & Hamidah (2022) shows that the use of applications such as Canva can increase students' interest in the material being taught. Based on the results of the research that has been described previously, the combination of analogy methods with infographic media can provide a more holistic learning experience, increase interest, and strengthen students' understanding of the subject matter. In addition, the use of the Canva application as an independent learning medium has proven effective, allowing students to learn interactively with visual elements that make it easier to understand complex material.

Based on previous opinions and research, this study aims to improve students' interest in learning and conceptual understanding of sociology through the analogy method and Canva infographic media. By integrating the two approaches, it is hoped that learning will be more interesting, interactive, and effective in helping students understand abstract social concepts. The advantage of this study lies in the complexity of the variables used, which are not only relevant to teaching Sociology, but also applicable to other social science disciplines. The results of this study are expected to provide a significant contribution in increasing students' interest and understanding of the subject of Sociology.

2. METHODS

This study uses a quantitative approach with a quasi-experimental method, using a one group pretest-posttest design. This design aims to evaluate the effect of using the analogy method and Canva infographic media on increasing students' learning interest and conceptual understanding. The initial test (pretest) was conducted to measure students' initial abilities, while the final test (posttest) was used to evaluate changes after the application of the treatment. This design is considered appropriate for research that focuses on changes in learning outcomes in one group of students without involving a control group, thus allowing researchers to directly measure the effectiveness of the learning methods applied.

The study involved 36 grade XI students enrolled in Sociology at SMA Negeri 8 Pontianak. Participants were selected through purposive sampling, ensuring alignment between the subject matter and the research objectives. The study's independent variables were the analogy method and Canva infographic media, while the dependent variables included students' learning interest and conceptual understanding. The analogy method aimed to make Sociology's abstract concepts more tangible, while Canva infographic media was utilized to visually simplify these concepts for better comprehension. The communicative value of graphic design elements was emphasized as crucial in presenting information clearly and engagingly (Mohamed et al., 2023).

The study employed various instruments, including learning outcome tests, learning interest questionnaires, observation sheets, and assessments of students' infographic products. The learning outcome test, consisting of multiple-choice questions, evaluated students' conceptual understanding before and after instruction. A Likert-scale questionnaire (1–5) assessed dimensions of students' interest, engagement, and motivation in learning. Observation sheets captured students' responses to analogies and infographic usage during the sessions. Additionally, students' infographic outputs were evaluated using a rubric that measured creativity, relevance, and alignment with Sociology concepts.

The research followed three primary stages. In the preparation stage, researchers developed analogy-based learning materials and Canva infographic media, validated the study instruments, and finalized technical arrangements. The implementation stage began with a pretest to assess students' baseline abilities. Students then participated in three learning sessions. In the first session, abstract concepts were explained using analogies. The second session focused on utilizing Canva infographic media for concept visualization. In the third session, students independently created infographics to reinforce their understanding. After these sessions, a posttest and questionnaire were administered to measure conceptual understanding and changes in learning interest.

Data analysis involved both descriptive and inferential statistical methods. Pretest and posttest scores were compared using a paired t-test to determine significant differences, while normalized gain scores assessed the learning method's effectiveness. Descriptive analysis of questionnaire results tracked changes in average scores, and a paired t-test evaluated significant differences in learning interest before and after treatment. Correlation analysis was conducted to examine the relationship between posttest conceptual understanding and learning interest. Finally, students' infographic products were assessed using a rubric to evaluate visualization quality and comprehension of the material.

The improvement in student learning outcomes is measured by the gain index analysis (N-Gain), which shows changes in student understanding through a comparison of pretest and posttest scores, with success indicators in the form of normalized gains in the medium to high categories.($\geqslant$0.3), with the following formula:

$$< G > = \frac{(score\ Posttest - pretest)}{(ideal\ score\ - pretest\ score)}$$

In addition, the increase in the learning interest questionnaire score is an indicator of the success of the method in increasing students' learning interest. The quality of the infographic product is also an important indicator for assessing students' ability to apply concepts that have been learned through creative and relevant visualizations. This approach ensures that the study meets the objectives of increasing students' learning interest and conceptual understanding in accordance with international scientific research standards.

3. FINDINGS AND DISCUSSION

This study shows a significant increase in students' conceptual understanding and interest in learning after the application of analogy-based learning methods combined with Canva infographic media. The pedagogical theory that has supported this study is the Constructivism theory by Jean Piaget and Vygotsky. This theory states that cognitive constructivism so that students learn new things and students can find complex information (Salsabila & Muqowim, 2024). This research experiment

begins by simplifying abstract concepts to be more understandable by connecting them to students' everyday experiences. Students build their initial knowledge based on previous knowledge, so this process includes the analogy method and is supported by Canva infographic media that makes it easier for students to understand abstract concepts through visualization so that they become concrete representations.In the first treatment, the analogy-based learning method began to be applied with the support of infographic creation tasks using Canva. The material taught focused on the concept of social groups. Before the treatment was given, students' learning motivation was at a low level. The results of observations at the pre-treatment stage showed that only 19% of students were able to focus during learning, while 81% showed a lack of focus. Students' interest in learning was also low, with only 19% of students reporting interest, while 81% were not interested. The indicators of feelings towards learning showed a similar pattern, where only 19% of students felt happy, while 81% felt dissatisfied. This low interest in learning was identified as a result of the use of lecture methods that were less varied, did not provide sufficient discussion space, and was minimal in encouraging student creativity and involvement.

In the first treatment, the analogy-based learning method began to be applied with the support of infographic creation tasks using Canva. The material taught focused on the concept of social groups. The second treatment was designed to overcome these obstacles by improving the learning approach. The examples of analogies used were more relevant, such as "cooking competition teams," which describe the dynamics of social groups in a simple but meaningful way. The explanation of the material was complemented by visualizations using PowerPoint to improve student understanding. In addition, peer tutors were involved to provide additional assistance in understanding the material and using Canva. In the third treatment, the material taught shifted to the topic of social group development. The analogy of the "community garden project" was chosen because of its high relevance to students' daily activities. Peer tutors were still involved in supporting students in understanding the material and overcoming technical challenges. After being given the third treatment, there was an increase in student interest to 81% of students showing focus in learning, 92% of students feeling interested, and 89% of students reporting feelings of pleasure towards learning.

The following presents the results of students' work using Canva and PowerPoint media in learning with the analogy method, which are shown in Figures 1, 2, and 3.

Figure 1. Canva infographic of student work

Figure 2. Image Slide Show on Powerpoint Media

Figure 3. Canva infographic of student work

The following table shows the pre-treatment and post-treatment score obtained by measuring students' focus, interest and positive feelings.

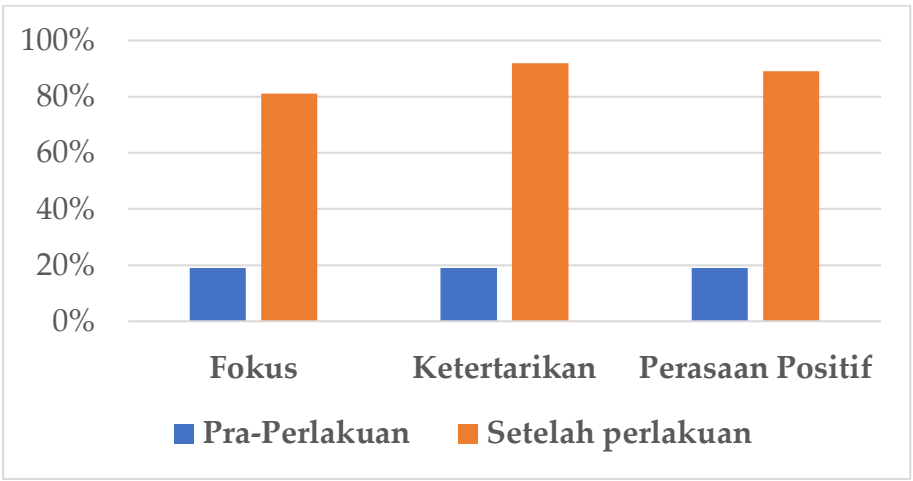

Figure 4. Pre-Treatment and Post-Treatment Score Obtaining

In this study, increasing students' interest in learning can be associated with three main factors, namely the relevance of analogies, the use of visual media, and intensive mentoring through peer tutors. Indicators of interest consist of focus, interest and positive feelings.

According to Gopinath & Santhi (2021), solutions that can be used when encountering difficulties in teaching students include through complex thinking exercises, interesting media such as diagrams, power points, video clips, fishbones, films and other visual things. As for the analogy method that is relevant to students' everyday experiences, such as "cooking competition teams" and "community garden projects," it helps to connect new concepts with things that are already familiar, thereby reducing cognitive load and increasing student understanding (Saxena et al., 2023). Previously Keri & Elbatarny (2021) noted that more than 70% of students reported an increase in understanding of difficult concepts after the analogy method was applied. The effectiveness of this analogy method is strengthened by the use of visual media such as PowerPoint, which according to Saleem & Akhbar (2022), can help explain abstract concepts in a clearer and more structured way, thereby increasing student engagement. In addition, intensive mentoring by peer tutors provides personalized support that allows students to learn at their own pace while receiving immediate feedback, creating a collaborative learning environment that enhances student motivation and performance (Timonera et al., 2023).

In the context of sociology learning, digital literacy is important because students need to master digital skills to be able to keep up with rapid technological developments (Murtadho et al., 2023). The approach that combines the analogy method and the use of Canva infographics has proven effective in increasing students' learning interest and conceptual understanding, especially in complex materials. The analogy method helps connect abstract concepts in sociology with students' everyday experiences, while Canva infographics, as an attractive visual medium, strengthen understanding by combining verbal and visual information. This approach supports the Dual Coding theory by Allan Paivio Ishi & Yamauchi (1994), which states that information is processed through verbal and visual channels, making it easier to understand and remember the material. The results of statistical analysis using the t-test (Paired Sample t-Test) showed a significant increase in the average score from pre-test (62.5) to post-test (81.5), indicating that the combination of the analogy method and Canva infographics can improve students' conceptual understanding in sociology.Table 1 below provides an overview of the differences in these results:

Table 1. Results of the analysis of the average post-test and pre-test scores and their differences

Statistics	Pretest	Posttest	Difference (Posttest - Pretest)
Mean (Average)	62.5	81.5	
Number of Students (N)	36	36	
Standard Deviation	13.91	9.6	
Standard Error Mean	2.32	1.6	
Correlation (Pretest & Posttest)	0.745	-	
Significance of Correlation	0	-	
t-value (t-test)	-	-	-12.240
Degrees of Freedom (df)	-	-	35.000
Significance (2-tailed)	-	-	0.000

Meanwhile, the comparison graph is as follows:

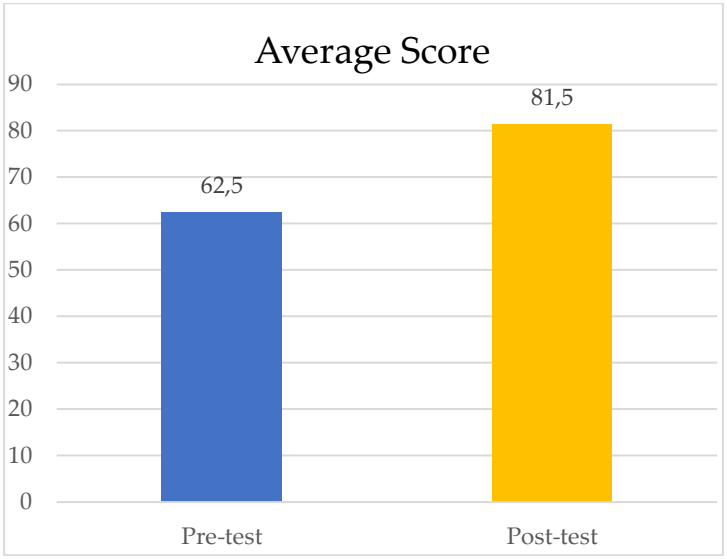

Figure 5. Graph of Pre-Treatment and Post-Treatment Score Obtaining

The results of the study showed a significant increase in students' conceptual understanding and learning interest after the application of the analogy method combined with Canva infographics. The results of the analysis showed a significant increase in the average pre-test score (62.5) and post-test (81.5), with a difference (gain) of 19. The highest score in the pre-test was 74, while the lowest score was 52. In the post-test, the highest score was 88 and the lowest score was 74. To measure the extent of the increase in students' understanding, the gain index was calculated using the Hake formula (in Sundayana, 2014). The calculation results showed that the gain index (G) was 0.5278, which is in the moderate category ($0.30 < G \leq 0.70$). This indicates a moderate increase in students' conceptual understanding after the application of the analogy method and Canva infographics in sociology learning. Although there was a significant increase, there is still potential to increase the effectiveness of this learning method in the future.

This study also uses effect size to measure the strength of the influence of the learning method, with Cohen's d showing a significant difference between pre-test and post-test scores with the following formula:

$$d = \frac{M1 - M2}{SD\text{pooled}}$$

Information:
M1 = Post-test mean
M2 = Pre-test average
SDpooled = Combined Standard Deviation of both groups (pre-test and post-test)

The use of Cohen's d is relevant to measure the difference between students' pre-test and post-test scores after the application of the Canva analogy and infographic methods. The calculation of Cohen's d helps assess the effectiveness of this intervention, providing empirical evidence of its impact in increasing students' interest and understanding of Sociology learning. The formula for determining SDpooled is as follows:

$$SD\text{pooled} = \sqrt{\frac{\text{SD}_1^2 + \text{SD}_2^2}{2}}$$

Information:
SD1 and SD2 = standard deviation of pre-test and post-test.

The calculations involving standard deviation were in the pre-test (SD_1 = 13.91) and post-test (SD_2 = 9.6), which showed variations in student scores before and after the application of the learning method.

Here are the steps to calculate SD Pooled
Take the given information:
Pre-test standard deviation (SD_1) = 13.91
Post-test standard deviation (SD_2) = 9.6
So:

$$SD\text{pooled} = \sqrt{\frac{13.91^2 + 9.6^2}{2}}$$

$$SD\text{pooled} = \sqrt{\frac{193.48 + 92.16}{2}}$$

$$SD\text{pooled} = \sqrt{\frac{285.64}{2}}$$

$SD\text{pooled} = \sqrt{142{,}82}$= 11.95

After obtaining SDpooled, Cohen's d can be determined using the following formula:

$$d = \frac{Mpost - Mpre}{SD\text{pooled}}$$

Mpost = 81.5 (post-test average)
Mpre = 62.5 (Pre-test average)
SDpooled = 11.95

So:

$$d = \frac{81.5 - 62.5}{11.95} = \frac{19}{11.95} = 1.58$$

The calculation begins by measuring the average of the pre-test (62.5) and post-test (81.5) scores, then calculating the pooled standard deviation (SDpooled) which produces a value of 11.95. Cohen's d value = 1.58 indicates a high difference between the pre-test and post-test scores (d ≥ 0.8), indicating significant effectiveness of the learning intervention as stated by Backer(Umam & Jiddiyyah, 2020)in the following table:

Table 2. Interpretation of Cohen's d effect size criteria

Cohen's d effect size	Criteria
d ≥ 2.1	Very high
0.8 ≤ d ≤ 2.0	High
0.5 ≤ d ≤ 0.79	Currently
0.2 ≤ d ≤ 0.49	Low
0.0 ≤ d ≤ 0.19	Very Low

This study shows that the application of analogy-based learning methods combined with Canva infographic media can significantly increase students' conceptual understanding and interest in learning. This finding is consistent with the constructivism theory by Piaget and Vygotsky in Salsabila & Muqowim (2024), which emphasizes that knowledge is built through experience and social

interaction. In the context of sociology learning, the use of analogy methods that connect abstract concepts to students' everyday experiences, such as "cooking competition teams" to illustrate social group dynamics, allows students to build new knowledge based on existing knowledge. This approach reduces students' cognitive load and makes it easier for them to understand complex material.

In addition, the use of Canva infographic media has proven to be very effective in improving student understanding. As a visual aid, infographics are able to present information more clearly and attractively, which encourages student involvement in learning. Before the implementation of this method, only 19% of students showed focus and interest in the learning material. However, after the implementation of the analogy-based learning method and Canva infographics, 81% of students showed high focus, 92% felt interested, and 89% felt happy with the learning. The results of this study support the findings Gopinath & Santhi (2021) which states that visual media, such as infographics, can increase student engagement in learning.

The analogy method used, such as the “community garden project” to illustrate the development of social groups, has also been shown to be effective in deepening students’ understanding of difficult concepts. Research Saxena et al. (2023) revealed that analogies relevant to students' everyday experiences can facilitate their understanding of the material being taught. This is reinforced by the use of PowerPoint for visualization of the material and peer tutoring, which provides direct feedback to students, allowing them to learn at their own pace.

A significant increase in pre-test and post-test scores (from 62.5 to 81.5), obtained through a t-test, also shows the effectiveness of this learning method. Cohen's d value of 1.58 shows that the influence of the Canva analogy and infographic-based learning method is very large, with a high effect category (Umam & Jiddiyyah, 2020). This indicates that the combination of these two methods not only improves students' conceptual understanding but also improves their engagement in learning sociology.

This approach is also in line with the Dual Coding theory by Allan Paivio in Ishi & Yamauchi (1994), which states that information processed through verbal and visual channels is easier to understand and remember. Canva infographics, which combine visual and textual elements in delivering material, enable students to process information more effectively and support the development of their digital literacy skills. In line with the findings Murtadho et al. (2023), digital literacy instilled through the use of learning tools such as Canva enriches students' learning experiences in the digital era.

Overall, this study provides strong evidence that combining analogy methods with visual media such as Canva can significantly increase students' learning interest, conceptual understanding, and engagement in sociology learning. This approach is not only effective in addressing the challenges of learning abstract social concepts, but also opens up opportunities for innovation in 21st-century learning, which prioritizes critical thinking skills, creativity, and collaboration (Yuningsih & Susilo, 2018).

4. CONCLUSION

This study demonstrates that combining analogy-based learning methods with Canva infographic media significantly enhances students' conceptual understanding and engagement in sociology learning. Quantitative analysis revealed a substantial improvement in student performance, with the average pre-test score increasing from 62.5 to 81.5 on the post-test, a statistically significant difference ($p < 0.001$). The large effect size (Cohen's $d = 1.58$) further underscores the effectiveness of this pedagogical approach. Analogies like "cooking competition teams" and "community garden projects" helped students connect abstract sociological concepts to their daily experiences, while Canva infographics reinforced learning by integrating verbal and visual information. Student engagement improved notably, with focus, interest, and positive feelings rising from 19% pre-intervention to 81%, 92%, and 89%, respectively, post-intervention.

The findings support constructivist theories by Piaget and Vygotsky, emphasizing the value of experiential and socially interactive learning, and align with Paivio's Dual Coding Theory, highlighting the benefits of combining verbal and visual learning channels. Additionally, the research underscores the importance of digital literacy in modern education, showing how tools like Canva enhance learning experiences while developing essential 21st-century skills.

However, the study is limited by its focus on a single subject and a specific student group, which may affect the generalizability of the results. Future research could explore this method across diverse subjects, age groups, and educational settings. Longitudinal studies could also examine the lasting impact of analogy-based and visual media-enhanced learning on students' knowledge retention and skill development.

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