Coggle's Role in Sharpening Students' Critical Thinking in Islamic Religious Education learning

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Abstract

The digital era has led to the growing integration of technology in education, including Islamic Religious Education learning. Visual organizer applications such as Coggle offer great potential for improving learning effectiveness and students' critical thinking skills. However, its use in the context of Islamic Religious Education learning is still limited, so more in-depth research is needed to explore its benefits and implications more broadly. Therefore, this study was conducted to further analyze the use of Coggle in building students' critical thinking skills in PAI lessons at SMAN 3 Semarang. Based on the results of observations, interviews, and document studies, this study found that Coggle was proven to be effective in helping students break down complex PAI material into a more structured form, visualize the relationships between

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concepts, and encourage them to analyze and conclude information. The collaborative process of creating concept maps also allows students to evaluate their own understanding by comparing different points of view. In conclusion, the use of Coggle not only deepens students' understanding of PAI material, but also hones critical thinking skills that can be applied in other subjects. The integration of Coggle into PAI learning is highly recommended as an innovative step to create an interactive learning environment and produce a critical and creative generation.

Keywords: Coggle Visual Organizer, Critical Thinking, Islamic Religious Education learning.

A. INTRODUCTION

The ever-evolving digital era has made technology an integral part of various aspects of life, including education (Salma Fatimah et al. 2024). One of the main challenges in education today is how to utilize technology to improve the quality of learning, especially in building students' critical thinking skills (Rusiadi 2024). This skill is one of the crucial abilities that must be possessed. It will make a person more competitive in creating new things. Critical thinking is an essential skill that is not only needed in an academic context, but also in dealing with the complexities of everyday life (Iftirosy, Ningsih, and Sancaya n.d.). In the context of Islamic Religious Education learning, critical thinking skills are very important because students are expected not only to understand religious teachings in text, but also to be able to apply these values in a broader and more relevant context (Jannah et al. 2024). In addition, the integration of technology in Islamic Religious Education can facilitate interactive learning experiences, allowing students to collaborate, discuss, and reflect on their beliefs and

practices. By utilizing digital tools, educators can create an environment that encourages exploration and dialogue, which ultimately leads to a deeper understanding of Islamic teachings.

One medium that can be used to encourage critical thinking is a visual organization application such as Coggle. This application allows students to visualize their ideas in a structured and systematic manner, thereby facilitating the process of analyzing, synthesizing, and evaluating information (Failasufa, Astini, and Rachmayani n.d.). By using Coggle, students can organize their thoughts more effectively, identify relationships between concepts, and develop more in-depth arguments (Siti Nuraeni Mitra, Siti Qomariyah, and Siti Rahmawati 2023). This is in line with the objectives of PAI learning, which emphasizes memorizing material and understanding and applying religious values in real life (Hakim n.d.). In addition, Coggle's collaborative features allow students to work together, share ideas, and provide feedback to one another, thereby forming a learning community. This collaborative aspect encourages students to engage in discussions, challenge each other's views, and deepen their understanding of the subject matter. Integrating Coggle into the learning process can significantly improve students' critical thinking skills and their ability to apply religious teachings in practical situations.

Many previous researchers have successfully analyzed the use of media to improve students' critical thinking in PAI learning. The research is divided into three trends: First, it focuses on utilizing the MindMeister visual organizer application. Research conducted by Dwi Susanti (2023) found that using the MindMeister visual organizer application plays an active role in building strategic thinking,

especially in PAI learning. Second, research that focuses on efforts to build students' critical thinking skills through game media. Research conducted by Abdillah Hinda Al Hikam et al. (2025) also found that game-based learning can be helpful for teachers; game-based learning can be used to assist teachers in conducting learning and knowing the abilities of each student. Third, the trend of research focuses on building critical thinking skills through learning media innovation. This research was initiated by Tatang Hidayat (2023), who found that the contextual teaching and learning (CTL) model in learning Islamic religious education can increase students' thinking levels by linking learning materials with the context of real life. This model involves students physically and mentally, allowing them to build understanding based on their existing knowledge and practice solving problems collaboratively. With this approach, CTL becomes a practical alternative model for internalizing Islamic values in PAI learning.

Several previous studies have successfully analyzed findings related to the development of critical thinking in Islamic Religious Education students through various means, such as interactive teaching methods, collaborative learning, and technology integration. These studies highlight the importance of developing critical thinking skills to improve students' understanding and application of religious values in real-life situations. However, an important aspect that has not been explored in depth by previous researchers is the use of the Coggle Visual Organizer application in building students' critical thinking in PAI learning.

As a visual organizer tool, Coggle offers a unique approach to helping students organize their thoughts, visualize complex concepts, and identify relationships between different ideas. Educators can create a more

engaging and interactive learning environment by integrating Coggle into PAI lessons, thereby encouraging students to analyze, synthesize, and evaluate information effectively. The gap in this research opens up opportunities to investigate how Coggle can specifically improve critical thinking skills in PAI education, which ultimately contributes to a more meaningful learning experience.

This article aims to 1) explain the application of the Coggle visual organizer, 2) explain the use of the Coggle visual organizer application in Islamic religious education, and 3) explain the implications of applying the Coggle visual organizer on the critical thinking skills of students at SMAN 3 Semarang in Islamic religious education. This analysis is expected to provide an overview of the potential use of technology in improving the quality of Islamic religious education and provide recommendations for educators to integrate digital tools such as Coggle into the learning process. This analysis is expected to provide an overview of the potential use of technology in improving the quality of Islamic religious education and provide recommendations for educators to integrate digital tools such as Coggle into the learning process.

B. METHOD

The research method used in this study was a qualitative approach with a case study design (Assyakurrohim et al. 2022). This approach was chosen to gain an in-depth and contextual understanding of the phenomenon of using Coggle to develop students' critical thinking. This research was conducted at SMAN 3 Semarang in the odd semester of the 2025/2026 academic year, with the research subjects being grade XI students who were

actively involved in learning using the Coggle application. The object of this research focused on the process of utilizing the Coggle Visual Organizer application itself and the manifestation of students' critical thinking skills that emerged during the learning process.

Data collection techniques were carried out using multiple methods to ensure data completeness and accuracy. Primary data was obtained through passive participant observation to directly observe classroom dynamics, as well as semi-structured in-depth interviews with students to explore their perceptions, experiences, and challenges. In addition, document studies were applied to the Lesson Plans (RPP) and student work in the form of mind maps from Coggle to analyze their quality. A questionnaire was also used to gather broader data on students' perceptions of the ease and benefits of the application (Abdul Rahman et al. 2022).

All collected data was then analyzed using Miles and Huberman's interactive model, which consists of three main stages. The first stage is data reduction, where raw data is filtered and focused on the most relevant information. The second stage is data presentation, which is presented in the form of descriptive narratives and tables to facilitate understanding of patterns and relationships. The third stage is drawing conclusions, where the findings are interpreted to answer the research questions. To ensure data validity, triangulation techniques were applied, namely by comparing and checking the consistency of data across various sources (students), various methods (observation, interviews, and documents), and reviewed from the perspective of relevant theories (Qomaruddin and Sa'diyah 2024).

C. RESULT AND DISCUSSION

1. Defining Coggle Visual Organizer for Education

Coggle Visual Organizer is a digital tool designed to aid learning by visualizing ideas and information through structured diagrams (Kamrozzaman, Badusah, and Mohammad 2018). This tool allows users to create interactive and easy-to-understand concept maps, where each idea or topic can be connected with lines and branches that show the relationships between concepts. Coggle is very useful in education because it helps students and teachers organize lesson material systematically, thereby facilitating understanding and retention of information (Kamrozzaman, Badusah, and Mohammad 2018). With a simple and intuitive interface, Coggle facilitates real-time collaboration so that students can work together on group projects or class discussions (Kamrozzaman, Badusah, and Mohammad 2018).

Figure 1 Coggle Visual Organizer initial dashboard

In the context of education, Coggle Visual Organizer can be used for various purposes, such as planning projects, summarizing lesson material, or evaluating student understanding (Sehan Rifky, 2024). Teachers can use Coggle to explain complex concepts visually and attractively, while students can use it to develop their critical and creative thinking skills. Additionally, Coggle supports integration with various other digital platforms, such as Google Drive, making it easy to store and share documents. Thus, Coggle is an effective tool for increasing student engagement in learning and helping to create a more collaborative and innovative learning environment.

On the other hand, students can use Coggle to develop their critical and creative thinking skills. By organizing their thoughts visually, they can identify connections between different ideas, which facilitates deeper understanding and encourages them to think critically about the subject matter. This process promotes creativity, as students can explore different ways to represent their ideas and arguments.

2. The Urgency of Critical Thinking in Education

In contemporary society, the development of critical thinking skills within the framework of education has transcended its status as a mere pedagogical goal, evolving into an inevitable prerequisite for facing the multifaceted challenges of the 21st century (Olga Lucía Uribe Enciso, Diana Sofía Uribe Enciso, and María del Pilar Vargas Daza 2017). The

urgent need to foster critical thinking among students stems from the exponential proliferation of information, the increasing complexity of global issues, and the need to nurture citizens who are able to distinguish truth from falsehood (Raj T, Mehrotra R, and Sharma M 2022). Critical thinking is essential in education because it equips students to analyze, evaluate, and synthesize information in order to make informed decisions. Although critical thinking is very important, its implementation can be uneven across schools due to systemic inequalities. Educators must design inclusive curricula that engage all students, especially those from underserved communities, with rigorous and relevant learning experiences.

Critical thinking is crucial in education as it is the foundation for developing analytical, creative, and problem-solving skills (Rahmawati, Pujiastuti, and Cahyaningtyas 2023). In an era of fast-paced and complex information, students are not only required to memorize facts. However, they must also be able to evaluate, analyze, and synthesize information from various sources (Herdiansyah and Puteri 2024). Critical thinking helps students distinguish between valid and invalid information, making better and more responsible decisions. In addition, this ability also encourages students to think independently and not be easily swayed by unfounded opinions or propaganda (Agus Wibowo, 2024).

In education, critical thinking also contributes to forming a more open, reflective, and responsible student character (Sunaryati et al. 2025). Teachers play an important role in creating a learning environment that encourages students to question, debate, and explore

various perspectives (Siti Nurhalizah and Putri Octa Hadiyanti 2025). Critical thinking prepares students to face academic and real-life challenges, such as future social, ethical, and professional issues (Rifa Hanifa Mardhiyah et al. 2021). Therefore, integrating critical thinking in the education curriculum is a must to prepare a generation that is competent, adaptive, and contributes positively to society.

Critical thinking skills are also increasingly recognized as essential in Islamic Religious Education (PAI). Scholars find that implementing critical thinking in Islamic Religious Education enhances meaningful learning outcomes and deepens understanding of religious teachings (Dahari A, Suhid A, and Fakhrudin F 2019). Integrative learning strategies, such as group discussions, case study analyses, and problem-solving activities, have effectively developed students' critical thinking skills. These approaches improve students' critical thinking abilities, increase their engagement, and foster a reflective approach to moral values. Studies have demonstrated that classes promoting critical thinking development in PAI result in a significantly better quality of school life, class climate, and student participation than traditional teaching methods (Altinyelken H 2021). Integrating critical thinking in PAI is crucial for producing an intellectual and reflective community that addresses contemporary challenges while maintaining a strong foundation in Islamic principles.

3. **Utilization of Coggle Visual Organizer Application for Building Students' Critical Thinking in Islamic Religious Education Learning at SMAM 3 Semarang**

The use of the Coggle Visual Organizer application in Islamic Religious Education learning is an innovative solution for developing students' critical thinking skills. Coggle is a tool that enables interactive and collaborative concept mapping (Siti Rosnani Suliaman and Mohd Jasmy Abd Rahman 2023). In the context of PAI, this application helps students organize information, connect religious concepts, and analyze material in depth. Clear visualizations make it easier for students to understand the relationships between themes such as faith, morals, jurisprudence, and Islamic history, thereby encouraging critical and holistic thinking. Another advantage of Coggle is its ability to facilitate collaborative learning (Dewantara 2019). Students can work in groups to create concept maps, a process that not only trains critical thinking but also hones communication and cooperation skills. In addition, Coggle's features for adding images, colors, and links enhance student creativity (Dewantara 2019), allowing them to express their thoughts personally and connect religious concepts to a broader life context. Overall, Coggle is a powerful tool for shaping a generation that is critical, creative, and virtuous through a deeper understanding of the material.
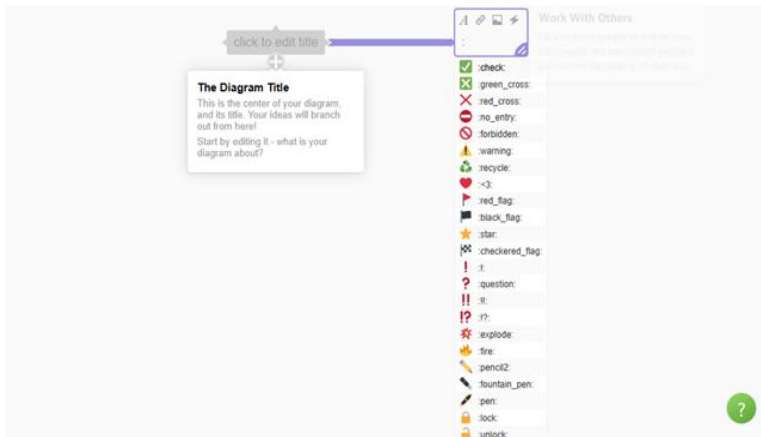
Figure 2 Coggle Features

Based on the interviews, the students' initial response to Coggle was one of curiosity and enthusiasm accompanied by confusion. As Respondent A said, "When I was first introduced to it, I felt curious and quite enthusiastic, but also a little confused," a statement that was in line with the impressions of Respondent B and Respondent C, who found the process "a little confusing, but exciting." The main challenge they faced together was the lack of an 'undo' feature, where deletion errors could not be recovered. However, after overcoming this initial challenge, all three agreed that Coggle was ultimately easy to learn and a fun tool to use.

Coggle has proven to be effective in breaking down large topics into smaller, more structured parts. As Respondent A said, "Coggle is very helpful in breaking down large topics into smaller parts. For example, when studying Tabligh, I can separate the definition, characteristics, provisions..." This analytical process not only deepens understanding of individual components, but also raises awareness of the relationships between

concepts. Respondent A added, "When creating a mind map... I realized that there is a connection between tabligh and dakwah," an insight supported by Respondent C, who realized that "the three materials are interrelated." Respondent B also experienced something similar, coming to understand that "sermons have requirements, pillars, and manners that are interrelated." Furthermore, the collaborative process of comparing friends' mind maps provided valuable perspectives on the diversity of ways of thinking. Seeing the differences in branch structures, Respondent A realized that he "learned another way of explaining things," while Respondent B concluded that "everyone has a different way of thinking." Thus, Coggle not only encourages systematic and analytical thinking, but also hones critical skills through comparative reflection that encourages re-evaluation of one's own understanding.
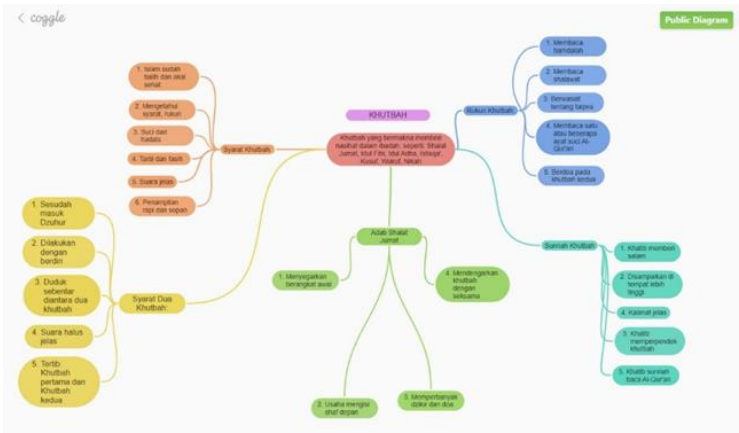

Figure 3 Student Concept Map (Dakwah, Khutbah, and Tablig)

Students find learning with Coggle more effective than linear note-taking. The main reason is the visualization capabilities offered by mind maps. As Respondent A stated, "Because I can see the connections between the material, I can remember and understand the lesson content more quickly," a benefit that was also emphasized by Respondent B, "...with mind maps, I can see the connections between concepts visually." This advantage is followed by the development of self-evaluation skills, where students proactively double-check their work. Respondent A and Respondent B both made it a habit to revise their mind maps after finishing them, with Respondent A checking for "incomplete or misplaced parts" and Respondent B ensuring that "the sequence is logical and complete." Furthermore, students also saw the potential for transferring these skills. Respondent A stated, "Yes, it can definitely be used in other subjects, such as History or Biology," which was then given a concrete example by Respondent C who imagined its use for "grouping organs and their functions" in Biology lessons. Thus, Coggle not only improves understanding in PAI, but also equips students with learning methods that can be applied widely.

D. CONCLUSION

Based on the analysis conducted, it can be concluded that the use of the Coggle Visual Organizer application in Islamic Religious Education learning at SMAN 3 Semarang has proven to be effective in building students' critical thinking skills. This effectiveness is realized through Coggle's ability to help students break down complex Islamic Religious Education topics into structured parts, visualize

the relationships between concepts, and encourage the process of analyzing and synthesizing information. Through its collaborative features, Coggle allows students to discuss and compare different perspectives, which in turn encourages evaluation and reflection on their own understanding. This process not only improves in-depth and holistic understanding of the material but also develops metacognitive skills. Furthermore, students acknowledge that learning with mind maps is more effective than linear note-taking because it makes it easier for them to see the relationships between materials and strengthens their memory. Equally important, the critical and systematic thinking skills developed through Coggle are transferable and can be applied in other subjects. Thus, the integration of Coggle into PAI learning is an innovation that has successfully created an interactive learning environment that not only deepens religious understanding but also equips students with critical thinking skills that are essential for facing the challenges of the 21st century.

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