A COMMUNITY SERVICE INITIATIAIVE AT SD SUGIWARAS 1 TUBAN: GAME-BASED LEARNING FOR PROBLEM-SOLVING TO ENHANCE ELEMENTARY STUDENTS' CRITICAL THINKING

Ahmad Khoirul Fuadi[1], Firman Maulana Zikri[2], Sintya Wati[3], Sinta Nuriya[4], Diva Meisyatus Sa'adah[5], Eva Fitriatul Imah[6], Miftakhur Rohman[7], Saidatul Muthoharoh Falihah[8], M Misbahul Faizin[9]

[1] Institut Teknologi dan Bisnis Tuban, Indonesia, khoirulfuadi1217@gmail.com
[2] Institut Teknologi dan Bisnis Tuban, Indonesia, firmanmz141@gmail.com
[3] Institut Teknologi dan Bisnis Tuban, Indonesia, sintiawati641@gmail.com
[4] Institut Teknologi dan Bisnis Tuban, Indonesia, sintanuriya234@gmail.com
[5] Institut Teknologi dan Bisnis Tuban, Indonesia, meisyasaadah05@gmail.com
[6] Institut Teknologi dan Bisnis Tuban, Indonesia, evafitriatulimah@gmail.com
[7] Institut Teknologi dan Bisnis Tuban, Indonesia, miffrohman2@gmail.com
[8] Institut Teknologi dan Bisnis Tuban, Indonesia, nabilafatiinn@gmail.com
[9] Institut Teknologi dan Bisnis Tuban, Indonesia, retepak548@gmail.com

ABSTRACT

This paper explored the outcomes of a game-based learning initiative conducted at SD Sugiwaras 1 Tuban, focusing on its potential to foster critical thinking, teamwork, and problem-solving skills among elementary school students. The program incorporated interactive games such as Estafet Sarung, Memindahkan Gelas dengan Balon, and Estafet Karet, which promoted collaboration, creative problem-solving, and emotional regulation. Findings from the initiative aligned with established theories of cooperative learning, social interactionism, and self-efficacy, emphasizing the value of playful learning activities in enhancing cognitive and social skills. The results demonstrated the effectiveness of game-based learning in improving interpersonal relationships, peer interactions, and social-emotional development, supporting its integration into broader educational practices. The study highlighted the role of scaffolding and teacher facilitation in overcoming initial challenges, illustrating the transformative impact of theory-based interventions in real-world educational contexts.

Keywords: *Community Service, Game-Based Learning, Problem Solving, Critical Thinking, Elementary School Students*

I. INTRODUCTION

Critical thinking is a fundamental skill that empowers individuals to analyze, evaluate, and solve problems effectively. For elementary school students, developing this skill at an early stage can significantly impact their academic and social success. Problem-solving, as an integral aspect of critical thinking, equips students with the ability to approach challenges systematically and creatively (Ennis, 2011). However, fostering critical thinking in young learners requires innovative and engaging strategies that align with their developmental needs. Game-based learning has emerged as an effective approach to promote problem-solving and critical thinking among elementary students. By combining play and education, it encourages active participation, collaboration, and strategic thinking, making it an ideal method for young learners (Gee, 2003).

SD Sugiwaras 1 in Tuban, East Java, was chosen as the focus of this community service initiative due to observed gaps in students' problem-solving abilities during classroom interactions and group activities. Teachers reported that many students faced difficulties in formulating solutions to everyday challenges, often relying on rote learning rather than critical analysis. Such challenges underscore the need for targeted interventions that can stimulate students' cognitive and social development. Research has shown that interactive and play-based approaches, such as game-based learning, significantly enhance students' problem-solving skills and foster a deeper understanding of concepts (Vygotsky, 1978; Whitebread et al., 2012).

Game-based learning not only engages students but also encourages collaboration, communication, and creativity—skills that are essential for holistic development. As noted by Hattie (2009), interactive learning experiences help students develop metacognitive skills, enabling them to reflect on their thought processes and improve their problem-solving strategies. Moreover, incorporating games into education creates a dynamic learning environment where students can experiment, fail, and try again in a supportive context, thereby building resilience and perseverance (Fisher et al., 2011).

This article explored a community service initiative aimed at enhancing problem-solving and critical thinking among students at SD Sugiwaras 1 through game-based learning. By integrating educational games into the school curriculum, the program seeks to provide students with opportunities to develop critical life

skills while fostering an engaging and enjoyable learning atmosphere. Through a combination of theoretical insights and practical interventions, this initiative aspires to serve as a model for integrating innovative teaching strategies in similar educational contexts.

II. METHODOLOGY

The community service initiative at SD Sugiwaras 1 employed a participatory and game-based learning approach to enhance elementary students' problem-solving skills and critical thinking. The methodology focused on structured group activities that encouraged active participation, collaboration, and strategic thinking. The intervention involved the implementation of three educational games tailored to the students' developmental needs: Estafet Sarung (Sarong Relay), Memindahkan Gelas dengan Balon (Glass Transfer with Balloons), and Estafet Karet (Rubber Band Relay).

Each game was designed to foster specific problem-solving and teamwork skills. Estafet Sarung required students to work in teams to pass a sarong along a line without using their hands, promoting communication, creativity, and coordination. Memindahkan Gelas dengan Balon challenged students to move plastic glasses using the air from inflated balloons, encouraging patience, precision, and innovative thinking. Finally, Estafet Karet involved transferring rubber bands from one stick to another using only a pair of chopsticks, which tested students' fine motor skills, focus, and cooperative problem-solving.

The program was conducted over a series of sessions, with each game introduced through clear instructions and demonstrations to ensure students understood the objectives and rules. Teams were formed to encourage peer interaction, and teachers acted as facilitators, providing guidance and support as needed. Observational data were collected during the games to assess students' problem-solving strategies, collaboration, and adaptability.

At the end of each session, a reflection period was held where students discussed the challenges they faced and the solutions they devised during the activities. This reflective practice aimed to help students internalize the lessons learned and connect their experiences to real-life problem-solving scenarios. Teachers and facilitators also provided feedback to reinforce positive behaviors and identify areas for improvement. By incorporating these interactive and enjoyable activities, the methodology created an engaging learning environment

where students could develop critical thinking skills while building social bonds and confidence.

III. RESULTS

The implementation of the game-based learning initiative at SD Sugiwaras 1 Tuban demonstrated a comprehensive approach to fostering critical thinking, teamwork, and problem-solving skills among elementary school students. The program was designed to address developmental challenges in a creative and engaging manner, using games tailored to the cognitive and social capacities of different grade levels. Each game—Estafet Sarung, Memindahkan Gelas dengan Balon, and Estafet Karet—offered unique opportunities for students to collaborate, strategize, and build essential interpersonal and physical skills in an enjoyable and supportive environment.

The Estafet Sarung activity, conducted for grades 1 and 2, involved transferring a sarung from one team member to another without breaking hand contact. This game encouraged students to work cohesively as a team, focusing on coordination, balance, and precision. Observations revealed that students quickly adapted to the rules and worked together to overcome challenges, fostering a sense of shared responsibility and mutual trust. Teachers noted that the activity not only enhanced physical coordination but also strengthened social bonds among peers, creating a collaborative classroom culture.

Figure 1. Estafet Sarung Game Conducted by Students of SD Sugiwaras 1 Tuban

For grades 3 and 4, the Memindahkan Gelas dengan Balon activity emphasized creative problem-solving and effective communication. Students used inflated balloons to move plastic cups without directly touching them,

requiring careful breath control and precise movements. While initially challenging, the activity prompted students to develop innovative strategies, such as managing air pressure and adjusting their angles, to ensure the cups reached the designated target. The activity highlighted the importance of resilience and adaptability, as students learned from their mistakes and refined their techniques. Teachers reported that the game significantly boosted students' confidence and ability to articulate their thoughts clearly during teamwork.

Figure 2. Memindahkan Bola dengan Gelas Game Conducted by students of SD Sugiwaras 1 Tuban

The Estafet Karet activity, designed for grades 5 and 6, was particularly effective in cultivating patience, fine motor skills, and advanced problem-solving abilities. Students transferred rubber bands using straws, passing them along to teammates without the use of their hands. This activity required precision, focus, and consistent communication among team members. As the game progressed, students demonstrated improved teamwork and coordination, developing strategies to complete the task efficiently. Teachers observed that the activity helped students regulate their emotions and maintain concentration under pressure, important skills for both academic and social success.

Figure 3. Estafet Karet Game Conducted by Students of SD Sugiwaras 1 Tuban

The program produced notable social and behavioral changes. Across all grade levels, students displayed heightened teamwork, stronger communication skills, and a greater sense of accountability for their roles within a team. Problem-solving abilities became evident as students assessed challenges, brainstormed solutions, and collaboratively executed strategies. These changes extended beyond the classroom, with parents reporting improvements in their children's cooperative behaviors and conflict resolution skills at home. Additionally, the program inspired teachers to explore further integration of game-based learning in their daily lesson plans, recognizing its potential to enhance student engagement and learning outcomes.

Figure 4. The Winners of the Games were Receiving Door Prizes

By integrating these evidence-based strategies, the program at SD Sugiwaras 1 Tuban achieved significant outcomes, creating an engaging learning environment that supported the holistic development of students. Beyond the immediate benefits of teamwork and critical thinking, the initiative fostered long-term skills that will serve the students in navigating more complex social and academic challenges. The program's success also serves as a model for similar educational settings, demonstrating the transformative power of game-based learning in fostering cognitive, emotional, and social growth.

IV. DISCUSSION

The outcomes of the game-based learning initiative at SD Sugiwaras 1 Tuban reflect the significant potential of such approaches in fostering critical thinking, teamwork, and problem-solving skills among elementary school students. These findings are supported by existing theories and empirical studies, which emphasize the role of interactive and playful activities in child development. This section analyzes the results of the program within the context of relevant literature and theoretical frameworks, highlighting its contribution to educational practice and its alignment with global best practices.

The success of the Estafet Sarung game in improving coordination and teamwork aligns with the findings of Johnson et al. (2007), who assert that cooperative learning activities enhance students' interpersonal skills and their ability to function effectively in group settings. By requiring students to maintain hand contact while passing the sarung, the activity fostered a sense of shared responsibility and mutual trust. This result is consistent with Vygotsky's (1978) social interactionist theory, which posits that learning is a social process facilitated through collaboration and guided interaction.

Memindahkan Gelas dengan Balon activity further underscores the importance of creative problem-solving and communication in team-based tasks. According to Fisher et al. (2011), structured play activities that encourage strategic thinking and collaboration are instrumental in developing higher-order cognitive skills in young learners. This game required students to manipulate physical objects using unconventional methods, thereby stimulating their ability to innovate and adapt. These findings resonate with the work of Whitebread et al. (2012), who identified playful learning as a critical factor in enhancing self-regulation and adaptive problem-solving skills.

For the older students, the Estafet Karet game demonstrated the value of fine motor skill development and emotional regulation in group dynamics. The precise and coordinated actions required to transfer rubber bands using straws mirror the findings of Pellegrini and Holmes (2006), who highlight the role of dexterity-focused games in strengthening cognitive control and focus. Moreover, the emphasis on maintaining composure under pressure reflects Bandura's (1997) self-efficacy theory, which emphasizes the importance of mastery experiences in building confidence and resilience.

The broader social changes observed, such as improved teamwork and communication skills, align with the conclusions of Denham et al. (2015), who note that early interventions targeting social-emotional learning have lasting impacts on children's ability to navigate complex social environments. Teachers and parents noted that the skills cultivated during these games translated into better peer interactions and conflict resolution outside the classroom, demonstrating the program's broader societal benefits.

The integration of game-based learning also finds strong support in contemporary educational practices. According to Zosh et al. (2018), playful learning approaches create an engaging and meaningful context for skill acquisition, promoting intrinsic motivation and deeper learning. The observed enthusiasm and active participation of students in the activities at SD Sugiwaras 1 Tuban are consistent with this assertion, highlighting the capacity of such interventions to bridge the gap between play and pedagogy.

However, challenges encountered during the program, such as initial difficulties in coordination and communication, underscore the need for continuous guidance and scaffolding. This aligns with Bruner's (1976) concept of scaffolding, which emphasizes the role of supportive structures in enabling learners to accomplish tasks beyond their independent capabilities. The role of teachers as facilitators was crucial in guiding students through these challenges, reinforcing the collaborative nature of the learning process.

The findings of this community service initiative reaffirm the critical role of game-based learning in fostering essential skills among elementary school students. By integrating theoretical insights and empirical evidence, the program not only enhanced the immediate learning outcomes but also contributed to the long-term development of students' social and cognitive abilities. This initiative serves as a model for implementing playful learning strategies in similar

educational contexts, demonstrating the transformative potential of integrating theory-based interventions into practical applications.

V. CONCLUSION AND RECOMMENDATION

The community service initiative at SD Sugiwaras 1 Tuban successfully demonstrated the effectiveness of game-based learning in fostering critical thinking, teamwork, and problem-solving skills among elementary school students. Activities such as Estafet Sarung, Memindahkan Gelas dengan Balon, and Estafet Karet engaged students in a dynamic learning process, improving their coordination, communication, and strategic thinking. These results affirm the importance of integrating playful, collaborative activities into the educational framework to enhance both cognitive and social skills. Furthermore, the positive changes observed in students' interactions and behaviors reflect the potential of such interventions to foster a more supportive and cohesive learning environment, aligning with contemporary educational theories and practices.

To build on these successes, it is recommended that game-based learning strategies be further incorporated into the regular curriculum at SD Sugiwaras 1 Tuban. Teachers should receive training to facilitate similar activities, ensuring the sustainability and scalability of the program. Additionally, a more systematic evaluation of long-term impacts could provide deeper insights into how such interventions influence students' academic and social development over time. Future programs might also consider expanding the range of games to include activities targeting other developmental areas, such as emotional regulation and leadership skills, thereby creating a holistic framework for character building and critical thinking in elementary education. By prioritizing interactive and engaging learning methods, this initiative not only enriches the educational experience of students at SD Sugiwaras 1 but also serves as a replicable model for other schools seeking to enhance problem-solving and teamwork skills through innovative teaching approaches..

VI. ACKNOWLEDGEMENT

We would like to express our deepest gratitude to SD Sugiwaras 1 Tuban for their warm welcome and enthusiastic participation in this community service initiative. Our heartfelt thanks go to the school principal, teachers, and staff, who provided unwavering support and assistance throughout the program. Their commitment to fostering a nurturing and dynamic learning environment has been

instrumental in the success of this project. We also extend our appreciation to the students of SD Sugiwaras 1 Tuban, whose enthusiasm, creativity, and cooperation during the activities were truly inspiring. Their active engagement in the games and willingness to learn have reinforced the importance of implementing innovative approaches to education. Lastly, we acknowledge the parents and the broader school community for their encouragement and collaboration, which greatly contributed to the smooth execution of this program. It is our sincere hope that this initiative will leave a lasting impact on the students and inspire continued efforts in enhancing educational experiences through interactive and meaningful activities..

REFERENCES

Bandura, A. (1997). Self-efficacy: The exercise of control. Freeman.

Bruner, J. (1976). The culture of education. Harvard University Press.

Denham, S. A., et al. (2015). Social-emotional learning and early intervention. Early Childhood Research Quarterly, 30, 58-71.

Ennis, R. H. (2011). Critical thinking: Reflection and perspective part II. Inquiry: Critical Thinking Across the Disciplines, 26(2), 5-19.

Fisher, E., et al. (2011). The role of play in problem-solving and cognitive development. Early Childhood Education Journal, 39(6), 391-398.

Fisher, K., Hirsh-Pasek, K., Newcombe, N., & Golinkoff, R. M. (2011). Taking shape: Supporting preschoolers' acquisition of geometric knowledge through guided play. Child Development, 82(1), 187–204.

Gee, J. P. (2003). What video games have to teach us about learning and literacy. Palgrave Macmillan.

Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge.

Johnson, D. W., Johnson, R. T., & Holubec, E. J. (2007). Cooperation in the classroom (8th ed.). Allyn & Bacon.

Pellegrini, A. D., & Holmes, R. M. (2006). The role of play in school-based learning and development. Educational Psychology Review, 18(4), 337-350.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Harvard University Press.

Whitebread, D., Basilio, M., Kuvalja, M., & Verma, M. (2012). The importance of play in promoting healthy child development and maintaining strong parent-child bonds. American Journal of Play, 3(4), 449–472.

Whitebread, D., et al. (2012). The importance of play in the development of children's self-regulation and problem-solving skills. Early Years, 32(2), 145-157.

Zosh, J. M., et al. (2018). Learning through play: A review of the evidence. In Play = Learning: How Play Motivates and Enhances Children's Cognitive and Social-Emotional Growth. Oxford University Press.