



Integrating Video Simulation into Hybrid Problem-Based Learning: A Strategy for Fostering Critical Thinking and Problem-Solving Abilities in Grade X Students Studying Basic Programming Algorithms

Deni Agustin Suliantini^{1*}, Siti Masitoh², Bachtiar S Bachri³
^{1,2,3} Universitas Negeri Surabaya, Surabaya, Indonesia



DOI: <https://doi.org/10.53621/ijocer.v3i2.372>

Sections Info

Article history:

Submitted: August 3, 2024

Final Revised: August 29, 2024

Accepted: September 21, 2024

Published: December 31, 2024

Keywords:

Basic programming algorithms
Critical thinking;
Problem-based learning;
Problem-solving abilities;
Video simulation.



ABSTRACT

Objective: This study aims to determine the effectiveness of video simulation on hybrid problem-based Learning (PBL) in improving grade X students' critical thinking and problem-solving skills using primary programming algorithm material. **Method:** The research method used is quantitative, with a quasi-experimental research type and pretest-posttest control group design. This study involved 30 students in the control and 30 in the experimental classes. The research sample was selected using a purposive sampling technique with the criteria of grade X students studying basic programming algorithms. Data collection techniques used questionnaires or questionnaires from 2 research instruments: critical thinking and problem-solving abilities. Data analysis in this study used normality tests and homogeneity tests. **Results:** This study showed a significant increase in grade X students' critical thinking and problem-solving abilities in studying basic programming algorithms after video simulation integration in HPBL intervention. **Novelty:** The integration of video simulation in HPBL provides a concrete visual representation that helps students understand abstract concepts and apply theory in real situations, enriching the learning process of basic programming algorithms. Future research is expected to explore other learning methods to improve the effectiveness of hybrid problem-based learning so that students have a learning style in learning basic programming algorithms.

INTRODUCTION

Critical thinking plays a crucial role in the academic development of high school students, particularly in subjects like Basic Programming Algorithms. By integrating critical thinking into the learning process, students can enhance their problem-solving abilities, make informed decisions, and evaluate information effectively (Matthee & Turpin, 2019). Critical thinking is not just about recognizing different ideas but also about researching and clarifying them to improve outcomes for everyone involved. (Yafie et al., 2020). It is a constructive and progressive mindset that can significantly impact teaching quality and students' learning experiences (Ronkainen et al., 2019). In addition to critical thinking, students also need problem-solving skills in this learning. It enables students to identify, analyze, and solve various problems that arise during the programming process. By honing their problem-solving skills, students can better understand and apply basic programming concepts and improve their ability to make the right decisions in complex situations. It also encourages students to innovate and look for alternative problem-solving approaches, which enhances their creativity and logical thinking skills.

However, students' critical thinking and problem-solving skills in learning Basic Programming Algorithms still need to be improved. Indonesian students' critical

2. 372-Article Text-Deni Agustin Suliantini Final.doc

ORIGINALITY REPORT

17%

SIMILARITY INDEX

15%

INTERNET SOURCES

16%

PUBLICATIONS

1%

STUDENT PAPERS

PRIMARY SOURCES

1	ejournal.insuriponorogo.ac.id Internet Source	8%
2	journal.formosapublisher.org Internet Source	2%
3	Submitted to Universitas Negeri Surabaya Student Paper	1%
4	Muralidhar Kurni, K. G. Srinivasa. "The Internet of Educational Things", Springer Science and Business Media LLC, 2025 Publication	1%
5	Evania Yafie, Zakiah Mohamad Ashari, Norazrena Abu Samah, Riyana Widiyawati, Diana Setyaningsih, Yudha Alfian Haqqi. "Effectiveness of Seamless Mobile Assisted Real Training for Parents (SMART-P) Usage to Improve Parenting Knowledge and Children's Cognitive Development", International Journal of Interactive Mobile Technologies (ijIM), 2023 Publication	1%
6	vital.seals.ac.za:8080 Internet Source	1%