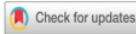




Analysis of Effectiveness PBL-STEM to Improve Student's Critical Thinking Skills

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ABSTRACT

Objective: This study aims to analyze the effectiveness of PBL-STEM in improving students' critical thinking skills. **Method:** The method used in this research is the literature review method. A literature review is a type of research that collects data and information from various sources by collecting and analyzing. This study analyzes as many as two national and international articles that can be accounted for. **The articles used** were published in 2018-2022. The steps in this Literature review method are identifying topics, searching for and selecting relevant articles, analyzing and synthesizing the literature, and creating a conclusion. **Results:** (1) the application of the PBL model can improve students' critical thinking skills; (2) the integration of STEM in the learning process is also able to improve critical thinking skills because STEM provides opportunities for students to identify real-life problems and solve them, which is per the characteristics of PBL; (3) the integration between PBL and STEM can be applied and can provide more effective results in improving students' critical thinking skills. **Novelty:** This study discusses the analysis of how effective the integration of STEM and PBL from the latest journals so that this research can be used as a reference for making quality learning tools.

INTRODUCTION

Education in the 21st century is focused on students' thinking skills. However, one of the skills that are very useful in the current and future eras is critical thinking skills (Nuraeni et al., 2019). Critical thinking is analyzing and evaluating data or information (Arends, 2012). Critical thinking is a person's way of answering a question systematically and precisely. Therefore, critical thinking will make students intelligent in thinking about the environment around them (Arifah et al., 2021). Critical thinking is creating arguments systematically and proactively using information gathered through observation, experience, reflection, offering arguments, or communication as a foundation for taking action (Nafiah, 2014). Critical thinking focuses on patterns of what must be believed, what must be done, and what can be accounted for when making decisions (Septi et al., 2022). Critical thinkers can solve problems logically, provide clear answers to questions, and come to reasoned conclusions about what to do or believe; critical thinking abilities are necessary (Hidayati et al., 2021). Critical thinking skills are broken down into 12 categories, including asking and answering questions, analyzing arguments, deciding whether or not to believe sources, observing and evaluating reports on findings from observations, deducing and evaluating conclusions from deductions, inducing conclusions from inductions, determining the value of consideration, defining terms and evaluating them, identifying assumptions, deciding on an action, and interacting. These aspects are grouped into five indicators: providing simple explanations, building basic supporting skills, concluding, making further explanations, and organizing strategies and tactics.

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