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Analysis of the Role of STEAM Education in Improving Critical Thinking Skills for Sustainable Development

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ABSTRACT

Objective: *The era of Society 5.0 requires individuals to have strong critical thinking skills. STEAM learning improves critical thinking skills by integrating science, technology, engineering, art, and math. This study aims to systematically review the existing literature on the effectiveness of STEAM learning in improving students' critical thinking skills, especially in achieving SDG point 4, namely quality education.* ***Method:*** *This research uses the literature review method. A total of 20 relevant articles that met the inclusion criteria were selected and analyzed in depth to identify key findings related to the impact of STEAM learning on the development of critical thinking skills.* ***Results:*** *The analysis shows that STEAM learning has significant potential in improving students' critical thinking skills. Some key findings include the following: STEAM learning stimulates students to think critically, creatively, and analytically in solving problems; STEAM facilitates the development of collaboration, communication, and problem-solving skills that are relevant to the demands of the future world of work, and STEAM learning contributes to the achievement of SDGs point 4 by providing quality and appropriate education for students.* ***Novelty:*** *This research contributes to the field of education by presenting a comprehensive review of the effectiveness of STEAM learning in improving critical thinking skills in the context of achieving SDGs point 4. The results of this research can be a reference for educators, curriculum developers, and policymakers in designing effective learning programs to prepare young people for future challenges.*

INTRODUCTION

Society 5.0 represents a transitional phase following Industry 4.0, focusing on the integration of technology with human aspects in daily life (Ardinata et al., 2022). This integration is particularly crucial in the field of education, where sustainable development goals (SDGs) underscore the need for inclusive and accessible quality education for all. To effectively achieve these SDGs, it is important to continuously assess educational policies to enhance their effectiveness (Akanbi & Adesina, 2024). In this context, education must not only impart academic knowledge but also foster lifelong learning skills that prepare individuals to tackle complex global challenges. People today must possess the ability to drive effective change, characterized by keen reasoning, informed decision-making, and careful observation of diverse situations. The capacity to analyze various perspectives is essential. One critical skill that individuals need to develop is critical thinking. This encompasses the ability to evaluate issues, substantiate claims with relevant evidence, and analyze problems thoughtfully (Setiawan et al., 2022). As society evolves, cultivating critical thinking skills becomes increasingly vital for personal and professional success.

Critical thinking skills have five aspects, indicators of individuals who have thought critically. The five indicators can be described as follows: Presenting essential explanations (Elementary Clarification); Forming basic skills (Basic Support);

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