

ABSTRAK

Pembelajaran berbasis proyek terintegrasi stream pada pembuatan teh kombucha untuk meningkatkan keterampilan berpikir kritis dan mengembangkan kreativitas siswa

Keterampilan berpikir kritis dan kreativitas merupakan kompetensi esensial abad ke-21 yang masih tergolong rendah, terutama pada materi bioteknologi yang bersifat abstrak. Penelitian ini bertujuan untuk menganalisis keterlaksanaan dan dampak pembelajaran berbasis proyek Project-Based Learning (PjBL) yang terintegrasi pendekatan STREAM (*Science, Technology, Religion, Engineering, Art, and Mathematics*) terhadap peningkatan keterampilan berpikir kritis dan kreativitas. Penelitian ini menggunakan metode mixed methods dengan desain exploratory sequential. Pemilihan sampel dilakukan dengan menggunakan teknik purposive sampling. Subjek penelitian adalah siswa kelas IX pada salah satu SMP di Kabupaten Cianjur. Data kualitatif dikumpulkan melalui observasi awal berupa tujuan pembelajaran dan miskonsepsi siswa serta hasil deskripsi observasi keterlaksanaan dan refleksi siswa, sedangkan data kuantitatif tes berpikir kritis dan penilaian kreativitas berbasis *Creativity Product Analysis Matrix* (CPAM). Hasil menunjukkan bahwa keterlaksanaan pembelajaran berada pada kategori sangat baik. Rata-rata N-Gain berpikir kritis kelas eksperimen mencapai 0,7057 (kategori tinggi), dengan indikator tertinggi pada "menyusun kesimpulan" (0,77). Kreativitas siswa juga menunjukkan capaian sangat baik, dengan skor tertinggi pada aspek "resolution" sebesar 94,3%. Refleksi siswa mengindikasikan peningkatan pemahaman konseptual dan antusiasme dalam proses pembelajaran. Gagasan baru dalam penelitian ini adalah integrasi aspek keberlanjutan dan nilai lokal ke dalam desain proyek sains berbasis PjBL-STREAM, yang menunjukkan potensi signifikan dalam mengembangkan keterampilan kognitif siswa secara menyeluruh melalui pembelajaran yang kontekstual dan berbasis pengalaman.

Kata Kunci: berpikir kritis, kreativitas, PjBL-STREAM, teh kombucha

ABSTRACT

Stream-Integrated Project-Based Learning In Kombucha Tea Production To Enhance Critical Thinking Skills And Foster Students' Creativity

Critical thinking and creativity are essential 21st-century competencies that remain relatively low, particularly in biotechnology topics that are abstract in nature. This study aims to analyze the implementation and impact of ProjectBased Learning (PjBL) integrated with the STREAM approach (Science Technology, Religion, Engineering, Art, and Mathematics) on enhancing students' critical thinking and creativity. A mixed-methods research design with an exploratory sequential approach was employed. The participants were Grade IX students from a junior high school in Cianjur Regency, selected through purposive sampling. Qualitative data were collected during the initial stage through observations of learning objectives, students' misconceptions, classroom implementation, and students' reflections. Quantitative data were obtained from critical thinking tests and creativity assessments based on the Creative Product Analysis Matrix (CPAM). The results indicated that the implementation of the learning process was categorized as excellent. The average N-Gain score for critical thinking in the experimental class reached 0.7057 (high category), with the highest indicator being —drawing conclusions (0.77). Students' creativity was also rated very high, with the highest score in the —resolution aspect (94.3%). Students' reflections revealed increased conceptual understanding and enthusiasm throughout the learning process. The novelty of this research lies in the integration of sustainability and local values into the design of STREAM-based science projects. This integration demonstrates significant potential in developing students' cognitive skills comprehensively through contextual and experiential learning.

Keywords: critical thinking, creativity, PjBL-STREAM, kombucha tea.