ABSTRAK

Isnaeni Apriliasanti (1202060039). "Studi Meta-analisis Pada Pendekatan Pembelajaran STEM, STEAM, STREAM Terhadap Hasil Belajar Biologi di Perpustakaan UIN Sunan Gunung Djati Bandung".

Pendekatan pembelajaran STEM, STEAM, dan STREAM merupakan strategi pembelajaran inovatif yang banyak diterapkan dalam pembelajaran Biologi untuk meningkatkan hasil belajar, literasi sains, serta kemampuan berpikir tingkat tinggi peserta didik sesuai tuntutan pendidikan abad ke-21. Meskipun demikian, hasil penelitian mengenai efektivitas ketiga pendekatan tersebut masih bervariasi sehingga diperlukan sintesis melalui penelitian meta-analisis. Penelitian ini bertujuan menganalisis besaran dampak (*effect size*) pendekatan STEM, STEAM, dan STREAM terhadap hasil belajar Biologi secara umum. Penelitian menggunakan *metode kuantitatif* design, Fixed-Effect Model di mana data kuantitatif menjadi fokus utama dan data kualitatif berfungsi sebagai pelengkap interpretasi hasil. Analisis dilakukan terhadap 20 skripsi mahasiswa Program Studi Pendidikan Biologi UIN Sunan Gunung Djati Bandung yang dipublikasikan pada periode 2019–2025 dan dipilih berdasarkan kriteria inklusi serta eksklusi. Perhitungan *effect size* menggunakan rumus Cohen's d dan Hedges' g untuk memperoleh estimasi pengaruh yang lebih akurat. Hasil penelitian menunjukkan bahwa seluruh studi memiliki *effect size positif* dengan kategori dominan besar hingga sangat besar. Pendekatan STEM, STEAM, dan STREAM terbukti efektif meningkatkan hasil belajar, keterampilan berpikir kritis, berpikir kreatif, literasi sains, dan kemampuan berpikir tingkat tinggi (HOTS), terutama pada materi ekosistem. Dengan demikian, ketiga pendekatan tersebut memiliki efektivitas tinggi dan direkomendasikan sebagai strategi pembelajaran Biologi yang inovatif, adaptif, dan relevan dengan kebutuhan pendidikan abad ke-21.

Kata Kunci : Effect Size, Hasil Belajar Biologi, Meta-analisis, STEM, STEAM, STREAM.

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ABSTRAK

Isnaeni Apriliasanti (1202060039). *"A Meta-Analysis Study on STEM, STEAM, and STREAM Learning Approaches to Biology Learning Outcomes in the Library of UIN Sunan Gunung Djati Bandung".*

STEM, STEAM, and STREAM learning approaches have increasingly been implemented in Biology education as innovative instructional strategies to improve students' learning outcomes, scientific literacy, and higher-order thinking skills in response to the demands of 21st-century education. However, previous studies have reported varying findings regarding the effectiveness of these approaches, highlighting the need for a comprehensive synthesis through meta-analysis. This study aimed to analyze the overall effect size of STEM, STEAM, and STREAM learning approaches on Biology learning outcomes. The study employed a kuantitatif, Fixed-Effect Model approach using an embedded design, in which quantitative data served as the primary focus while qualitative data supported the interpretation of the findings. The analysis was conducted on 20 undergraduate theses from the Biology Education Study Program at UIN Sunan Gunung Djati Bandung published between 2019 and 2025, selected based on predetermined inclusion and exclusion criteria. Effect sizes were calculated using Cohen's d and Hedges' g to obtain more accurate estimates of treatment effects. The results revealed that all studies reported positive effect sizes, with most classified as large to very large. The STEM, STEAM, and STREAM approaches were found to be effective in improving Biology learning outcomes, critical thinking, creative thinking, scientific literacy, and higher-order thinking skills (HOTS), particularly in ecosystem-related topics. Therefore, these approaches demonstrate high effectiveness and are recommended as innovative, adaptive, and relevant instructional strategies for Biology education in the 21st century.

***Keywords**: Biology Learning Outcomes, Effect Size, Meta-analysis, STEM, STEAM, STREAM.*

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