PLANT-MODIFIED WATER FILTRATION PROJECT AS STEM-BASED LEARNING TO ENHANCE SECONDARY STUDENTS' SUSTAINABLE CONSCIOUSNESS AND SYSTEM THINKING ON ENVIRONMENTAL POLLUTION

RESEARCH PAPER

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Pendidikan pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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DECLARATION

I do hereby declare that every aspect was written in this research paper entitled "Plant-Modified Water Filtration as STEM-Based Learning To Enhance Sustainable Consciousness And System Thinking On Environmental Pollution" genuinely results from my original idea, efforts, and works. The theories, finding of experts, opinions, and others contained in this paper have been quoted or referenced based on scientific code from UPI and following scientific ethics that applies in scholars' society. This declaration is created truthfully and consciously. When an infringement towards scientific ethics subsequently is found or if there is a claim of any others towards the authentically of this research paper, hence I am willing to be responsible and accept academic sanctions correspond to the rules.

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ABSTRACT

Systems thinking is a key ESD competency since it can help learners understand the complexity and dynamics of a world problem, and needs to be incorporated early in the school environment. This research aims to investigate the impact of sustainable consciousness and system thinking through a simple science project with Secondary students. This study used quantitative research in the form of a pre-experimental research with one group pretest-posttest design. The participant in this study were 20 7th-grade students in one private school in Bandung. The 2 instruments used in this research: questionnaire to measure students' sustainable consciousness and a test item to measure students' system thinking competency. Data from both instruments were analyzed using SPSS software and Rasch Stacking and Racking. Based on the Wilcoxon test result, there is no significant difference in sustainable consciousness after completing the learning activities. However, the Rasch analysis indicated a 15% improvement. Meanwhile, in system thinking competency, there is a significant difference after the learning activities based on the Wilcoxon result analysis, and a 50% improvement based on the Rasch analysis. It was shown that the use of the project to enhance sustainable consciousness and system thinking competency plays a critical role. But, the project on plant modified water filtration is not really affecting the students' sustainable consciousness. Because the environment that observed is quite clean and comfortable and students still do not really close to the context that discusses sustainable development goals.

Keywords: ESD, Sustainable Consciousness, System Thinking Comptency

PROYEK PENYARINGAN AIR BERMODIFIKASI TUMBUHAN SEBAGAI PEMBELAJARAN BERBASIS STEM UNTUK MENINGKATKAN KESADARAN BERKELANJUTAN DAN BERPIKIR SISTEM SISWA SEKOLAH MENENGAH TERHADAP PENCEMARAN LINGKUNGAN

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ABSTRAK

Berpikir sistem adalah kompetensi ESD yang utama karena dapat membantu peserta didik memahami kompleksitas dan dinamika masalah dunia, dan perlu diterapkan sejak dini di lingkungan sekolah. Penelitian ini bertujuan untuk menyelidiki dampak kesadaran berkelanjutan dan pemikiran sistem melalui proyek sains sederhana dengan siswa Sekolah Menengah. Penelitian ini menggunakan penelitian kuantitatif dengan bentuk penelitian pre-eksperimental dengan desain one group pretest-posttest. Peserta dalam penelitian ini adalah 20 siswa kelas 7 di salah satu sekolah swasta di Bandung. Instrumen yang digunakan dalam penelitian ini adalah 2 instrumen yaitu angket untuk mengukur kesadaran berkelanjutan siswa dan soal tes untuk mengukur kompetensi berpikir sistem siswa. Data dari kedua instrumen dianalisis menggunakan software SPSS dan Rasch Stacking and Racking. Berdasarkan hasil uji Wilcoxon, tidak terdapat perbedaan signifikan kesadaran berkelanjutan setelah selesai kegiatan pembelajaran. Namun, analisis Rasch menunjukkan peningkatan sebesar 15%. Sedangkan pada kompetensi berpikir sistem terdapat perbedaan yang signifikan setelah dilakukan kegiatan pembelajaran berdasarkan analisis hasil Wilcoxon dan peningkatan sebesar 55% berdasarkan analisis Rasch. Hal ini menunjukkan bahwa penggunaan proyek untuk meningkatkan kesadaran berkelanjutan dan kompetensi berpikir sistem memainkan peran penting. Namun, proyek penyaringan air yang dimodifikasi oleh tanaman tidak terlalu mempengaruhi kesadaran berkelanjutan siswa. Pasalnya, lingkungan yang diamati cukup bersih dan nyaman serta siswa masih belum terlalu dekat dengan konteks yang membahas tujuan pembangunan berkelanjutan.

Keywords: ESD. kesadaran berkelanjutan, kemampuan berpikir system

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

REFERENCES

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