INVESTIGATING STUDENTS' SCIENTIFIC LITERACY AND CREATIVITY THROUGH STEM-ENGINEERING DESIGN PROCESS IN ELEMENT, COMPOUND, AND MIXTURE TOPIC

RESEARCH PAPER

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Oleh
Andini Fajarwati

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 hereby declare that every aspect is written in this research paper with the title "Investigating Students' Scientific Literacy and Creativity Through STEM-Engineering Design Process in Element, Compound, and Mixture Topic" genuinely comes from my original thought, work, and effort. According to the UPI scientific code and the standards of scientific ethic that are followed in the academic community, the grand theories, opinions and thoughts, findings, and other fundamental information in this research paper have been quoted or referred. This statement was deliberately and honestly made. I am willing to take responsibility, commitment and accept academic punishment in accordance with the rules if a subsequent investigation reveals a breach of scientific ethics or if someone challenges the veracity of this research paper.

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INVESTIGATING STUDENTS' SCIENTIFIC LITERACY AND CREATIVITY THROUGH STEM-ENGINEERING DESIGN PROCESS IN ELEMENT, COMPOUND, AND MIXTURE TOPIC

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ABSTRACT

STEM-Engineering Design Process is one of the learning model that emphasize students to do the engineering activity to solve the real life problem. This study aims to investigate the effect of STEM-Engineering Design Process on students' scientific literacy and creativity in element compound, and mixture topic. Quasi-Experimental design is use in this study. The implementation of STEM-engineering design process was conduct in experiment class, while control class carried out conventional learning. Both classes are making water filtration tool. Purposive technique sampling was carried out to choose the sample with the certain category of 9^{th} grade students in one of the private school in Bandung, West Java, Indonesia. Students ranges in age 14-15 years old and were divide in experiment and control class. Each class has 19 students. This research use scientific literacy objective test and creativity questionnaire Likert scale to collect the data. The result of this study showed there is significant difference in students' scientific literacy and no significant difference in students' creativity between experiment and control class. The N-Gain score for scientific literacy of experiment and control class is 0.38 and 0.11 which describe as medium and low improvement. While for creativity, N-Gain score in experiment and control class is 0.06 and 0.03 which describe as low. From this, researcher conclude that STEM-engineering design process has positive impact on students' scientific literacy and creativity in learning element compound, and mixture.

Keywords: Creativity, Scientific Literacy, STEM-Engineering Design Process

INVESTIGASI LITERASI SAINS DAN KREATIVITAS SISWA MELALUI STEM-ENGINEERING DESIGN PROCESS DALAM TOPIK UNSUR, SENYAWA, DAN CAMPURAN

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ABSTRACT

STEM-Engineering Design Process merupakan salah satu model pembelajaran yang menekankan siswa untuk melakukan kegiatan rekayasa untuk memecahkan masalah kehidupan nyata. Penelitian ini bertujuan untuk menginvestigasi pengaruh *STEM-Engineering Design Process* pada literasi sains dan kreativitas siswa dalam topik unsur, senyawa, dan campuran. Desain Quasi-Experimental digunakan dalam penelitian ini. Implementasi *STEM-engineering design process* dilakukan di kelas eksperimen, sedangkan di kelas kontrol dilakukan pembelajaran konvensional. Kedua kelas tersebut membuat alat penyaring air. Pengambilan sampel dilakukan dengan teknik purposive untuk memilih sampel dengan kategori tertentu siswa kelas 9 di salah satu sekolah swasta di Bandung, Jawa Barat, Indonesia. Siswa berkisar pada usia 14-15 tahun dan terbagi dalam kelas eksperimen dan kontrol. Setiap kelas memiliki 19 siswa. Penelitian ini menggunakan tes objektif literasi sains dan angket kreativitas skala likert untuk mengumpulkan data. Hasil penelitian ini menunjukkan bahwa terdapat perbedaan yang signifikan pada literasi sains siswa dan tidak ada perbedaan yang signifikan pada kreativitas siswa antara kelas eksperimen dan kelas kontrol. Nilai N-Gain untuk literasi sains kelas eksperimen dan kontrol adalah 0,38 dan 0,11 yang tergolong peningkatan sedang dan rendah. Sedangkan untuk kreativitas nilai N-Gain pada kelas eksperimen dan kontrol adalah 0,06 dan 0,03 yang tergolong rendah. Dari sini peneliti menyimpulkan bahwa *STEM-engineering design process* berdampak positif terhadap literasi sains dan kreativitas siswa dalam pembelajaran unsur, senyawa, dan campuran.

Keywords: Kreativitas, Literasi Sains, *STEM-Engineering Desain Proses*

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