HALAMAN JUDUL

PENGEMBANGAN STEM-*FLIPPED CLASSROOM* (STEM-FC) PADA PERKULIAHAN GEOSAINS UNTUK MAHASISWA CALON GURU IPA

DISERTASI

diajukan untuk memenuhi sebagian syarat untuk memperoleh

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Oleh

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NIM 1604674

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PENGEMBANGAN STEM-FLIPPED CLASSROOM (STEM-FC) PADA PERKULIAHAN GEOSAINS UNTUK MAHASISWA CALON GURU IPA

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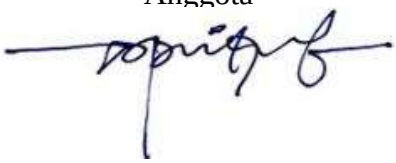

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ABSTRAK

Penelitian ini bertujuan untuk mengembangkan program STEM-FC pada perkuliahan geosains dan dampaknya terhadap literasi STEM mahasiswa. Penelitian ini menggunatan mixed method dengan desain *exploratory sequential design* (*QUAN Emphasized)*. Subjek penelitain yang terlibat yaitu 78 mahasiswa calon guru SD dan lima ahli pendidikan IPA. Implementasi program STEM-FC melibatkan mahasiswa calon guru SD yang dibagi dalam 2 kelompok, yaitu eksperimen dan kontrol. Kelompok eksperimen menggunakan STEM-FC sedangkan kelompok kontrol menggunakan model inkuiri. Instrumen penelitian yang digunakan yaitu kuesioner, tes literasi STEM, dan logbook peneliti. Data yang diperoleh dari kuesioner dan logbook dianalisis secara deskritif, sedangkan data literasi STEM dianalisis secara kuantitatif. Untuk mengetahui perbedaan rerata peningkatan literasi STEM mahasiswa di kelompok eksperimen dan kontrol digunakan uji statistik dengan bantuan program R. Hasil penelitian menunjukkan bahwa peningkatan literasi STEM mahasiswa di kelas eksperimen lebih tinggi dibandingkan dengan mahasiswa di kelas kontrol. Hasil uji statistik menunjukkan bahwa literasi STEM mahasiswa di kelompok eksperimen meningkat secara signifikan dibandingkan dengan kelompok kontrol. Domain konten, kompetensi, dan sikap literasi STEM mahasiswa di kelompok eksperimen juga meningkat secara signifikan dibandingkan dengan kelompok kontrol. Selain itu, hasil penelitian ini juga menunjukkan bahwa tidak terdapat perbedaan yang signifikan literasi STEM mahasiswa dengan prestasi akademik tinggi, sedang, dan rendah pada kelompok eksperimen. Temuan-temuan tersebut menunjukkan bahwa implementasi STEM-FC yang dikemas secara dual mode mampu memfasilitasi mahasiswa terlibat secara aktif dalam konstruksi pengetahuan sehingga membuat perkuliahan menjadi bermakna. Selain itu, kegiatan saintifik dan rekayasa yang diintegrasikan dalam proses perkuliahan mampu membekali dimensi kompetensi dan sikap literasi STEM mahasiswa calon guru. Oleh karena itu, penelitian ini memberikan bukti bahwa STEM-FC berkontribusi dalam pembekalan literasi STEM mahasiswa calon guru.

Kata-Kata Kunci: Pendidikan Geosains, Rekayasa, *Flipped Classroom*, Literasi STEM.

ABSTRACT

This study aims to develop the STEM-FC program in geoscience course and its impact on students' STEM literacy. This study used a mixed-method with an exploratory sequential design (QUAN Emphasized). This research subjects involved were 78 elementary school teacher candidates and five science education experts. The implementation of the STEM-FC involved prospective elementary school candidates who were divided into 2 groups, namely experiment and control. The experimental group used STEM-FC while the control group used the inquiry model. The research instruments used were questionnaires, STEM literacy tests, and researchers' logbooks. The data obtained from questionnaires and logbook were analyzed descriptively, while the STEM literacy data were analyzed quantitatively. To find out the difference in the average increase in student STEM literacy in the experimental and control groups, statistical tests with the help of the R program were used. The results showed that the increase in STEM literacy of students in the experimental class was higher than students in the control class. The results of statistical tests showed that the STEM literacy of students in the experimental group increased significantly compared to the control group. The content domain, competence, and attitudes of students' STEM literacy in the experimental group also increased significantly compared to the control group. In addition, the results of this study also show that there is no significant difference in STEM literacy among students with high, medium, and low academic achievement in the experimental group. These findings showed that the implementation of STEM-FC which is packaged in dual-mode can facilitate students to be actively involved in the construction of knowledge to make lectures meaningful. In addition, scientific and engineering practices that are integrated into the learning process can provide the competency dimensions and STEM literacy attitudes of prospective teacher students. Therefore, this study provided evidence that STEM-FC contributes to the provision of STEM literacy for prospective teacher students.

Keywords: Geoscience Education, Engineering, Flipped Classroom, STEM Literacy

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