PENGEMBANGAN STEM-*WORKBOOK* UNTUK MENINGKATKAN KETERAMPILAN PEMECAHAN MASALAH DAN KOLABORASI PESERTA DIDIK PADA KONSEP FLUIDA STATIS

TESIS

Diajukan untuk Memenuhi Sebagian dari Syarat untuk Memperoleh Gelar Magister Pendidikan Fisika

Disusun oleh:

VIVI MARDIAN
NIM 2208673

PROGRAM STUDI MAGISTER PENDIDIKAN FISIKA

FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM

UNIVERSITAS PENDIDIKAN INDONESIA

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Lembar Pengesahan Tesis

VIVI MARDIAN
2208673

PENGEMBANGAN STEM-*WORKBOOK* UNTUK MENINGKATKAN KETERAMPILAN PEMECAHAN MASALAH DAN KOLABORASI PESERTA DIDIK PADA KONSEP FLUIDA STATIS

Disetujui dan disahkan oleh:

Pembimbing I

Irma Rahma Suwarma, S.Si., M.Pd., Ph.D
NIP. 198105032008012015

Pembimbing II

Dr. Judhistira Aria Utama, M.Si.
NIP. 197703312008121001

Mengetahui,

Ketua Program Studi Sarjana dan Magister Pendidikan Fisika

Dr. Achmad Samsudin, M.Pd.
NIP. 198310072008121004

PERNYATAAN

Dengan ini saya menyatakan bahwa tesis dengan judul "Pengembangan STEM-*Workbook* Untuk Meningkatkan Keterampilan Pemecahan Masalah Dan Kolaborasi Peserta Didik Pada Konsep Fluida Statis" ini beserta isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 03 Juni 2024

Yang menyatakan,

Vivi Mardian

2208673

PENGEMBANGAN STEM-*WORKBOOK* UNTUK MENINGKATKAN KETERAMPILAN PEMECAHAN MASALAH DAN KOLABORASI PESERTA DIDIK PADA KONSEP FLUIDA STATIS

Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Magister Pendidikan (M.Pd) pada program Studi Pendidikan Fisika

Universitas Pendidikan Indonesia

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PENGEMBANGAN STEM-*WORKBOOK* UNTUK MENINGKATKAN KETERAMPILAN PEMECAHAN MASALAH DAN KOLABORASI PESERTA DIDIK PADA KONSEP FLUIDA STATIS

Vivi Mardian

2208673

Pembimbing I: Irma Rahma Suwarma, S.Si., M.Pd., Ph.D

Pembimbing II: Dr. Judhistira Aria Utama, M.Si

Prodi Magister Pendidikan Fisika FPMIPA UPI

ABSTRAK

Pendekatan STEM semakin diminati guru fisika untuk emningkatkan keterampilan abad 21 peserta didik. Namun, media belajar yang tersedia belum menyediakan praktik sains dan rekayasa yang mendorong keterampilan pemecahan masalah dan kolaborasi peserta didik. Penelitian ini bertujuan untuk mengungkapkan karakteristik STEM-*Workbook* berorientasi praktik sains dan rekayasa, mengkaji pengaruh penerapakan STEM-*Workbook* terhadap keterampilan pemecahan masalah dan kolaborasi peserta didik. Penelitian ini menggunakan desain metode campuran kompleks dengan jenis desain *experimental study*. STEM-*Workbook* dikembangkan berdasarkan model ADDIE. Instrumen penelitian berupa angket penilaian teman sejawat, lembar observasi, angket tanggapan peserta didik, dan soal keterampilan pemecahan masalah. Data dianalisis menggunakan software SPSS, Winsteps, dan Ms. Excel. Karakteristik STEM-*Workbook* yang dikembangkan dapat meningkatkan minat peserta didik terhadap pembelajaran STEM. Perolehan n-Gain kelas eksperimen yakni 0,64 (kategori sedang) dan kelas kontrol 0,33 (kategori sedang) serta uji Mann-Whitney diperoleh nilai Asymp. Sig. (2-tailed) 0,000. Hal ini menunjukkan ada perbedaan yang signifikan penggunaan STEM-*Workbook* terhadap keterampilan pemecahan masalah peserta didik di kelas eksperimen dibandingkan kelas kontrol. Hasil penilaian teman sejawat diperoleh nilai Asymp. Sig. (2-tailed) besar dari 0,05. Hal ini membuktikan tidak ada pengaruh yang signifikan penggunaan STEM-*Workbook* terhadpa keterampilan kolaborasi peserta didik kelas eksperimen dibandingkan kelas kontrol. Peneliti berikutnya dapat mengkaji pengaruh STEM-*Workbook* terhadap keterampilan proses sains peserta didik.

Kata kunci: STEM-*Workbook,* Keterampilan Pemecahan Masalah, Keterampilan Kolaborasi, Fluida Statis

DEVELOPMENT OF STEM-*WORKBOOK*S TO IMPROVE STUDENTS' PROBLEM SOLVING AND COLLABORATION SKILLS ON STATIC FLUID CONCEPTS

Vivi Mardian

2208673

Supervisor I: Irma Rahma Suwarma, S.Si., M.Pd., Ph.D

Supervisor II: Dr. Judhistira Aria Utama, M.Si

Master Program of Physics Education

Faculty of Mathematics and Science Education

Universitas Pendidikan Indonesia

ABSTRACT

Physics educators are increasingly turning to the STEM method to help their pupils develop 21st-century abilities. However, the existing learning resources do not yet include science and engineering techniques that promote students' problem-solving and teamwork abilities. The purpose of this study is to identify the features of scientific and engineering practice-oriented STEM-Workbooks while also investigating the impact of STEM-Workbooks on students' problem-solving and teamwork abilities. This study employs a complicated mixed methods design with an experimental study design type. STEM-Workbook was built using the ADDIE paradigm. The research tools included peer assessment questionnaires, observation sheets, student response questionnaires, and problem-solving skills questions. The data were analysed with SPSS, Winsteps, and MS applications. Excel. The properties of the STEM-Workbook produced can pique students' interest in STEM education. The n-Gain for the experimental class was 0.64 (medium category), whereas the control class had 0.33 (medium category), and the Asymp value was derived using the Mann-Whitney test. Sig. (2-tailed): 0.000. This demonstrates that the use of STEM-Workbooks has a substantial impact on the problem-solving skills of students in the experimental class compared to the control class. The peer evaluation findings yielded an asymp value. Sig. (2-tailed) >0.05. This demonstrates that utilising STEM-Workbooks had no significant influence on experimental students' collaboration skills when compared to the control class. Future researchers can examine the effect of STEM-Workbook on students' science process skills.

Keywords: *STEM-Workbook, Problem-solving Skill, Collaboration skills, Statics Fluid*

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2208673

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Yang menyatakan,

Vivi Mardian
NIM. 2208673

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DAFTAR GAMBAR

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