

THE IMPLEMENTATION OF STEM PROJECT-BASED LEARNING  
ON STUDENT'S STEM LITERACY AND PROBLEM-SOLVING  
SKILLS

RESEARCH PAPER

Submitted as Requirement to Obtain Degree of *Sarjana Pendidikan* in  
International Program on Science Education (IPSE) Study Program



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SHEET OF LEGITIMATION

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## DECLARATION

I do hereby declare that the research paper entitled “The Implementation of STEM Project-Based Learning on Student’s STEM Literacy And Problem-Solving Skills” and all of its content is genuinely pure result of my original ideas, effort, research, and work. This is not copied or plagiarized inappropriate ways from other papers. The opinions and findings of others which is contained in this research paper have been quoted and referenced based on scientific code of conduct and accordance with ethical science that applies in scholarly society. This declaration is created truthfully and consciously. When it is found an infringement towards scientific ethics, or if there is a claim of any others towards the authenticity of this research paper, hence I am willing to responsible and accept academics sanctions correspond to applicable rules.

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## PREFACE

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This research paper entitled “The Implementation of STEM Project-Based Learning on Student’s STEM Literacy And Problem-Solving Skills” is submitted to fulfill one of the requirements in accomplishing S1 Degree in International Program on Science Education FPMIPA Universitas Pendidikan Indonesia.

The author hopes this research paper can provide benefits and insight for the readers, also improve the quality of education. Aamiin.

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Bandung, August 2020

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# **THE IMPLEMENTATION OF STEM PROJECT-BASED LEARNING ON STUDENT'S STEM LITERACY AND PROBLEM-SOLVING SKILLS**

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## **ABSTRACT**

Indonesia is threatened with natural disasters during this COVID-19 pandemic as it is located on the Pacific Ring of Fire. Future generations should be prepared to provide STEM literacy related to solving a real-world problem using their integrated science and knowledge of technology, engineering, and mathematics. The need to produce better educational quality leads us to STEM Project-based Learning. Therefore, this research investigated the effect of STEM Project-Based Learning on student's STEM Literacy and Problem-Solving Skills. For the research, 30 7th grade students from one of junior high school in Bandung were chosen. The pre-experiment method with one group pre-test and post-test design in the form of multiple-choice and essay questions were used as the data collection tools. The data analysis showed the N-Gain score is 0.47 which categorized as medium improvement in STEM Literacy. Technology literacy was the highest improvement, while the Mathematical Literacy in the lowest. Nonetheless, the Problem-Solving skills N-gain score is 0.73 which categorized as high improvement. The highest improvement is in Idea-Finding, while the Fact-Finding on the lowest. Therefore, STEM Project-Based Learning is recommended to improve students' STEM Literacy and Problem Solving Skills since they had the experience to use their integrated knowledge in solving a real-world problem.

Keywords: STEM Project-Based Learning, STEM Literacy, Problem Solving Skills, Earth layer and disaster

# **IMPLEMENTASI PEMBELAJARAN STEM BERBASIS PROYEK DI LITERASI STEM SISWA DAN KETERAMPILAN PEMECAHAN MASALAH SISWA**

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## **ABSTRAK**

Indonesia juga terancam oleh bencana alam selama pandemi COVID-19 ini karena terletak di Lingkaran Api Pasifik. Generasi mendatang harus dipersiapkan untuk menggunakan literasi STEM terkait dengan pemecahan masalah dunia nyata menggunakan sains dan pengetahuan terintegrasi tentang teknologi, rekayasa, dan matematika. Kebutuhan untuk menghasilkan kualitas pendidikan yang lebih baik mengarahkan kita pada Pembelajaran Berbasis Proyek STEM. Oleh karena itu, penelitian ini menyelidiki pengaruh Pembelajaran Berbasis Proyek STEM terhadap Literasi STEM dan Keterampilan Pemecahan Masalah siswa. Untuk penelitian ini dipilih 30 siswa kelas VII dari salah satu SMP di Bandung. Metode pre-eksperimen dengan rancangan one group pre-test dan post-test berupa soal pilihan ganda dan uraian digunakan sebagai alat pengumpulan data. Analisis data menunjukkan nilai N-Gain sebesar 0,47 yang dikategorikan sebagai peningkatan literasi STEM sedang. Literasi teknologi mengalami peningkatan tertinggi, sedangkan literasi matematika mengalami peningkatan terendah. Meskipun demikian, skor N-gain keterampilan Pemecahan Masalah adalah 0,73 yang dikategorikan sebagai peningkatan tinggi. Peningkatan tertinggi pada Pencarian Ide, sedangkan Pencarian Fakta pada yang terendah. Oleh karena itu, Pembelajaran Berbasis Proyek STEM direkomendasikan untuk meningkatkan Literasi STEM dan Keterampilan Pemecahan Masalah siswa karena mereka memiliki pengalaman untuk menggunakan pengetahuan terintegrasi mereka dalam memecahkan masalah dunia nyata.

Kata kunci: Pembelajaran Berbasis Proyek STEM, Literasi STEM, Keterampilan Pemecahan Masalah, Lapisan Bumi dan Bencana Alam

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