

## DEVELOPMENT OF ETHNO-STEAM-BASED LIVE WORKSHEETS ON SENDANG LESTARI BATIK TO IMPROVE JUNIOR HIGH SCHOOL STUDENTS' SCIENCE LITERACY IN TEMPERATURE AND HEAT TOPICS

Revi Yuanita<sup>1</sup>, Mar'atus Revana<sup>2</sup>, Firda Shofiana<sup>3</sup>, Hasan Subekti<sup>4</sup>

<sup>1,2,3,4</sup> Faculty of Mathematics and Natural Sciences, Universitas Negeri Surabaya  
e-mail: [reviyuanita.21023@mhs.unesa.ac.id](mailto:reviyuanita.21023@mhs.unesa.ac.id)

### Abstract

This research aims to improve junior high school students' science literacy on temperature and heat through the implementation of Ethno-STEAM-Based Live Worksheets on Sendang Lestari Batik. Live Worksheets is an interactive online platform that transforms conventional activity sheets into engaging digital formats. This study is motivated by the low level of students' science literacy on temperature and heat topics. The development of STEAM-based e-LKPD (electronic student worksheets) is necessary to meet 21st-century learning demands. The Ethno-STEAM approach integrates local wisdom (batik) with science, technology, engineering, arts, and mathematics. The ethnosience aspect of this study is batik. This research employs the ASSURE model. The validation test results show that the live worksheet meets the "very valid" criteria with a score of 3.78. Furthermore, the analysis using normalized n-gain to measure pre-test and post-test improvements indicates an increase of 0.72, classified as high. Additionally, student response surveys show a high level of practicality with a percentage of 87.28%. The study is expected to demonstrate the process and effectiveness of implementing live worksheets to enhance students' science literacy in temperature and heat topics.

**Keywords:** Live Worksheet, Ethno-STEAM, Science Literacy, Temperature, Heat

### INTRODUCTION

In 2022, the Indonesian Ministry of Education and Culture implemented the "Merdeka Curriculum" across all education levels (Fikrina, 2023). This curriculum emphasizes the role of educators in facilitating integrated learning and fostering independent lifelong learners (Arifa, 2022). Education in Indonesia focuses on 21st-century learning, which includes the development of 4C competencies: critical thinking, communication, collaboration, and creativity (Andrian & Yusman, 2019). These competencies can be developed through integrated Ethno-STEAM project-based learning (Sumarni et al., 2022). The Ethno-STEAM approach combines local wisdom with science, technology, engineering, arts, and mathematics (Reffiane et al., 2021). This study explores batik as an ethnosience component.