

ABSTRACT

**Indah Mutiara Insani, IDN 4193332001 (2023). Development of STEM–
Based E-Student Worksheets to Improve Students’ Learning Outcomes on
Electrolyte and Non-Electrolyte Solution Subject**

This study aims to develop STEM-based E-Student Worksheets, determine the feasibility of STEM-based E-Student Worksheets assessed by material expert validators, learning experts, and design experts, to describe the effectiveness of STEM-based E-Student Worksheets in improving, student learning outcomes in the material electrolyte and non-electrolyte solutions. This type of research is development research (R&D) using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation. Product trials have been carried out on a limited group with a sample of one class consisting of 30 students of MAN 1 Medan. Data was obtained through validation questionnaires by material experts, three learning experts, three design experts and multiple choices test of 10 pretest and posttest questions each to measure student learning outcomes, then analyzed and described. Based on the feasibility assessment conducted by the experts, the results obtained were three validators material experts, three learning expert validators, and three design expert validators were declared very feasible to use in the learning process with successive average scores: 81.5%, 87.78%, and 85.97% with very feasible criteria and E-Student Worksheets based STEM which is designed to be effective for improving student learning outcomes and can be used in learning, with learning outcomes obtained an average pretest score of 51.67 and a posttest of 86.33 and an average N-Gain of 0.72 with high interpretation and with the percentage of completeness is 90%.

Keywords: E-Student Worksheets; STEM; Learning Outcomes; Electrolyte and Nonelectrolyte Solutions