

PENGEMBANGAN INSTRUMEN SOAL LITERASI STEM (*SAINS, TECHNOLOGY, ENGINEERING, AND MATHEMATIC*) PADA MATERI PERUBAHAN LINGKUNGAN ISU-ISU BERKELANJUTAN

TESIS

Diajukan untuk memenuhi salah satu syarat memperoleh gelar Magister pada
Program Studi Pendidikan Biologi



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Pengembangan Instrumen Soal Literasi STEM (*Sains, Technology, Engineering, and Mathematic*) pada Materi Perubahan Lingkungan Isu-Isu Berkelanjutan

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Sebuah Tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Magister Pendidikan Biologi pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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ABSTRAK

Literasi STEM (*Science, Technology, Engineering and Mathematic*) menjadi salah satu kemampuan esensial yang harus dimiliki oleh generasi muda untuk dapat berkontribusi dalam mengatasi tantangan perubahan lingkungan dan isu-isu berkelanjutan saat ini. Penelitian ini bertujuan untuk membuat soal literasi STEM yang sesuai dengan *framework* pada materi perubahan lingkungan isu-isu berkelanjutan (SDGs). Penelitian ini menggunakan metode *mixed method exploratory*. Partisipan yang terlibat yaitu 253 peserta didik kelas X di beberapa sekolah Kota Bandung. Sekolah sampel yang digunakan adalah SMA Negeri yang ada di Kota Bandung dengan teknik *purposive sampling*. Berdasarkan hasil validasi isi kepada ahli, test blueprint mendapat nilai rata-rata 3,4/4 dan instrumen test 3,6/4. Instrumen yang dikembangkan berupa 60 soal pilihan ganda dengan indikator literasi STEM yang diadopsi dari PISA 2018 dan NAEP 2014, yaitu menjelaskan fenomena secara ilmiah, mengevaluasi dan merancang penyelidikan ilmiah, menginterpretasi data dan bukti secara ilmiah, memahami prinsip-prinsip teknologi, mengembangkan solusi dan mencapai tujuan, merumuskan situasi secara matematis, dan menggunakan konsep, fakta, prosedur atau penalaran. Dari hasil validasi empiris, yaitu uji coba skala kecil dan skala besar didapat 60% soal diterima dan 20% soal direvisi dengan rata-rata nilai validitas 0,45 (sedang), rata-rata nilai reliabilitas 0,9 (sangat tinggi), rata-rata tingkat kesukaran 0,68 (sedang) dan rata-rata daya pembeda 0,49 (baik). Berdasarkan data *proportion correct*, diketahui literasi STEM peserta didik berada pada kategori sedang dengan rata-rata persentase 68%. Penelitian ini menghasilkan produk yang dapat digunakan oleh guru, berupa instrumen tes untuk mengukur literasi STEM peserta didik dan informasi tentang literasi STEM siswa.

Kata kunci: Instrumen penilaian, literasi STEM, perubahan lingkungan, isu-isu berkelanjutan (SDGs).

ABSTRACT

STEM literacy (Science, Technology, Engineering, and Mathematics) has become one of the essential skills that the younger generation must possess in order to contribute to addressing the challenges of environmental change and current sustainability issues. This research aims to create STEM literacy questions that align with the framework on environmental change and sustainability issues. (SDGs). This research uses an exploratory mixed methods approach. The participants involved are 253 tenth-grade students from several schools in the city of Bandung. The sample school used is a public high school located in the city of Bandung, with purposive sampling technique. Based on the results of the content validation by experts, the test blueprint received an average score of 3.4/4 and the test instrument received 3.6/4. The developed instrument consists of 60 multiple-choice questions with STEM literacy indicators adopted from PISA 2018 and NAEP 2014, which include explaining phenomena scientifically, evaluating and designing scientific investigations, interpreting data and evidence scientifically, understanding technological principles, developing solutions and achieving goals, formulating situations mathematically, and using concepts, facts, procedures, or reasoning. From the results of empirical validation, namely small-scale and large-scale trials, it was found that 60% of the questions were accepted and 20% were revised, with an average validity score of 0.45 (moderate), an average reliability score of 0.9 (very high), an average difficulty level of 0.68 (moderate), and an average discrimination power of 0.49 (good). Based on the proportion correct data, it is known that students' STEM literacy is in the moderate category with an average percentage of 68%. This research produces a product that can be used by teachers, in the form of a test instrument to measure students' STEM literacy and information about students' STEM literacy.

Key words: Assessment instrument, STEM literacy, environmental change, sustainable issues (SDGs).

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