

REKONSTRUKSI SIMULASI INTERAKTIF SIFAT-SIFAT BAHAN UNTUK MEMBANGUN *VIEWS OF NATURE OF SCIENCE AND TECHNOLOGY* SISWA SMP

ABSTRAK

Penelitian ini bertujuan untuk merekonstruksi simulasi interaktif sifat-sifat bahan untuk membangun *Views of Nature of Science and Technology* (VNOST) siswa SMP. Penelitian ini mengacu pada *Model of Educational Reconstruction* (MER) yang meliputi tiga komponen: 1) klarifikasi dan analisis materi sains, 2) studi empiris, dan 3) desain dan evaluasi pembelajaran. Instrumen penelitian yang digunakan adalah lembar analisis teks, pedoman wawancara pre-konsepsi, kuisioner VNOST, dan lembar validasi. Subjek penelitian adalah 30 orang siswa kelas IX di salah satu SMPN Kota Tasikmalaya, termasuk didalamnya melibatkan 10 orang siswa yang mengikuti wawancara pre-konsepsi. Pada komponen klarifikasi dan analisis materi sains dihasilkan ide-ide dasar mengenai konsep-konsep tentang sifat-sifat bahan berdasarkan perspektif saintis. Hasil studi empiris menunjukkan bahwa siswa belum memiliki pre-konsepsi yang utuh pada konsep klasifikasi bahan, partikel dan struktur bahan, sifat-sifat bahan, hubungan struktur dan sifat bahan dan dampak penggunaan bahan terhadap kesehatan; serta mayoritas siswa juga masih memiliki pandangan pada level *has merit* dan *naïve* hampir dalam semua aspek NOST yang disurvei. Simulasi interaktif dibuat menggunakan perangkat lunak *Adobe Flash Professional* dengan mempertimbangkan kemampuan awal siswa, tuntutan kurikulum serta hasil analisis materi sains. Simulasi interaktif menyajikan konten sains pada tingkat makroskopis dan submikroskopis yang didukung dengan pemodelan serta aspek-aspek NOST yang terkait. Dari hasil validasi ahli diperoleh bahwa simulasi interaktif layak digunakan dalam pembelajaran IPA SMP. Dari hasil uji coba terbatas diperoleh bahwa simulasi interaktif memiliki potensi untuk membangun VNOST siswa yang ditunjukkan oleh perubahan pandangan siswa ke arah yang semakin *realis* setelah menggunakan simulasi interaktif.

Kata kunci: Simulasi interaktif, VNOST, MER

RECONSTRUCTION OF INTERACTIVE SIMULATION ABOUT MATERIAL PROPERTIES TO BUILD VIEWS OF NATURE OF SCIENCE AND TECHNOLOGY OF JUNIOR HIGH SCHOOL STUDENTS

ABSTRACT

This study aims to reconstruct interactive simulation of material properties to build Views of Nature of Science and Technology (VNST) of junior high school students. This study refers to the Model of Educational Reconstruction (MER) which includes three components: 1) clarification and analysis of science material, 2) empirical studies, and 3) learning design and evaluation. The research instruments used were text analysis sheet, pre-conception interview guideline, VNST questionnaire and validation sheets. The research subjects were 30 students of class IX in one of public schools in Tasikmalaya City, including 10 students who participated in the pre-conception interview. In the component of clarification and analysis of science material, basic ideas were generated regarding concepts of material properties based on scientific perspective. The results of empirical studies showed that students' pre-conceptions were not complete in the following concepts: classification of materials, particles and material structures, materials properties, relationship between structure and material properties and the impact of the use of materials on health; and also the majority of students expressed has merit and naïve viewpoints in almost all aspects of NST. The interactive simulation was created using Adobe Flash Professional software by considering students' initial ability, curriculum demands and the results of analysis of science materials. Interactive simulation presents science content in macroscopic and submicroscopic levels, which is supported by modeling, as well as related aspects of NST. Based on the validation results, it was found that interactive simulation were suitable for use in junior high school science learning. The results of limited testing showed that interactive simulation has potential to build students' VNST as indicated by the changes to more realistic views after exposed to the interactive simulation.

Keywords: interactive simulation, VNST, MER