

Integration of Character Values and 21st Century Skills in the Development of Innovative Chemistry Experiments Based on Education for Sustainable Development (ESD)

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ABSTRACT

This study aims to: (1) identify character values and 21st century skills that are consistent with the need assessment results of book development for an innovative chemistry experiments, (2) analyze the book feasibility of an innovative chemistry experiments based on Education for Sustainable Development (ESD) that is developed in this study, and (3) analyze the user's responses to the book of innovative chemistry experiments based on ESD.

The research was carried out by exploratory mixed method. Qualitative stages began with an analysis of need assessment to the indicators of character values and 21st century skills. The next step is the activity of developing the chemistry experiments book through 4D stage. Then proceed with theoretical validation through expert judgments and revisions. The quantitative stage in this study was the feasibility test of the book by the judgments of high school chemistry teachers and the responses of high school students.

This research has succeeded in identifying the character values and 21st century skill which are integrated into the book of Innovative Chemistry Experiments Based on Education for Sustainable Development (ESD), which includes 10 indicators obtained a very good mean scores on 8 indicators, namely minimizing the use of dangerous and toxic chemicals, producing harmless and nontoxic products at the end of their useful life, making maximum use of local resources, doing experiment that able to develop independent economic business, doing experiment that able to improve social welfare, based on community needs, fostering creativity and innovation, emphasizing process skills (critical and psychomotor thinking skills), the relationship between experiments with phenomenon in everyday life (contextual content), while indicators that have a good score, namely: Experiments that are able to improve social welfare and insight to advance and develop in the framework of globalization. The quality of the book of innovative chemistry experiments based on Education for Sustainable Development (ESD) for class X, XI, and XII SMA/ MA which has been developed based on 15 chemistry teachers as reviewers in terms of content/ material components, presentation components, language components, and graphic components including into the very good category with the ideal percentage of 87.25% (Class X Book); 89.5% (Class XI Book), and 88.4 (Class XII Book). Overall the ideal percentage is 88.38% (VG). The level of enthusiasm (responses) in innovative chemistry experiment activities by 62 students included in the very high category with an average percentage of 98%.

Kata Kunci: Chemistry experiments, innovative, education for sustainable development