

DEVELOPING THE CONTENTS OF LIFE BASED LEARNING CURRICULUM THROUGH THE APPLICATION OF SEAT APPROACH-BASED MOOCs TO PRODUCE EXCELLENT AND COMPETITIVE GRADUATES OF NATURAL SCIENCE EDUCATION

by Dadan Rosana, Insih Wilujeng, Sabar Nurohman

ABSTRACT

Abstract

Industrial Revolution 4.0 has changed the orientation and the strategy of the learning process to be aligned with the development of information and technology. This condition also urges the Sciences Education Study Program, Faculty of Mathematics and Natural Sciences, Universitas Negeri Yogyakarta (UNY) to immediately correlate the Subject-Specific Criteria (SSC) into the graduates profile to adapt to the current demands. This study aims at (1) producing the curriculum content of life-based learning through the application of SEAT (Science Engineering, Agriculture and Technology) based MOOCs which is valid and practical to use, and (2) determine the effectiveness of the developed model to enhance excellent and competitive graduates of natural science education among prospective science teachers (students' thinking, collaboration skills, and environmental care attitude). The purpose of developing the Life Based Learning Curriculum content is to support the SSC by using the SEAT (Science Environmental Agriculture and Technology) learning approach. SEAT learning is considered effective because the learning content is relevant to the setting of student life in Indonesia of which an Agriculture-based environment. The learning process is assisted by digital technology, namely Massive Open Online Courses (MOOCs).

The research design used is a 4-D development model (define, design, develop, and disseminate). The product trial design used the pretest-posttest control group design. The trial subjects were selected using cluster random sampling technique of which two groups of trial subjects were obtained in the Biophysics class of Science Education Study Program from Faculty of Mathematics and Natural Sciences, Universitas Negeri Yogyakarta (UNY) in the academic year of 2019/2020. The number of students was 32 people for the experimental class and the control class, respectively. The validity and practicality of the developed curriculum content were analyzed with descriptive quantitative based on the assessment from the experts and the practitioners, while its effectiveness to enhance generic science skills and curiosity was analyzed using the MANOVA test. The results showed that (1) the developed curriculum content of the life-based learning curriculum was valid and practical for science learning with "very good" category and (2) the content of the life based learning curriculum was effective in improving generic science skills and the curiosity among prospective science teachers. The research methodology to produce this learning model was the Research & Development with the spiral model consisting of 5 D development stages, (1) define, (2) design, (3) model, (4) develop, and (5) deliver. The results of this study are; (1) the development of Life Based Learning curriculum content through the application of MOOCs with the SEAT approach that is feasible and practical, and (2) the curriculum content which is effective to enhance students' thinking, collaboration skills, and environmental care attitude. Further researches can be done by implementing a life-based learning curriculum with a more varied online learning to other 21st century competencies.

Research Outputs that have been realized: (1) Book Draft: Biophysics an Introduction, (2) Proceeding Article (ICRIEMS 7th in the process of publishing in the IOP Journal of Physics Conference Series), (3) Article Journal IJEP (Submitted). Research outputs in the process of realization; (1) Visiting Professor online, 8 online lectures by K.Bauraphan from Mahidol University for students of the Science Education Study Program, Faculty of Mathematics and Natural Sciences, UNY. (scheduled for 4-8 November 2020), (2) Visiting Professor online, 8 times online lectures by Dadan Rosana from the Science Education Study Program of FMIPA UNY at the Institute for Innovative Learning, Mahidol University.

Kata Kunci: *Life Based Learning, SETS, MOOCs, Competitive Graduates*