

## **Design and Analysis of the Basic Physics Practicum Model Based on the Higher Order Thinking Laboratory as a Model for 21st Century Learning Practicum**

*Ana Dhiqfaini Sultan, Ma'ruf Ma'ruf, Riri Kurniawan, Nurfadillah Nurfadillah, Ariani Ariani, Muhammad Hasbi Assidiq*

### **Abstract**

The type of research used is development research, with a Research and Development (R&D) research design. This research design is used to produce a product and test the effectiveness of a product. The development procedures are (1) needs analysis; (2) product development (design, manufacture and product validation); (3) product trials; and (4) product revision. The participants for the product trial were physics education students at the University of Muhammadiyah Makassar who programmed the Basic Physics I Practicum course with a total of 13 people. In order to obtain complete data and for the sharpness of data analysis, several research instruments will be used, namely: Higher-order thinking skills test. The student response questionnaire in this study was used to determine student responses about the HOTS-based physics practicum model that was developed and its implementation process. Based on the results of the development of the HOTS-based practicum model starting from the design stage to the revision stage of the HOTS-based practicum model product that the HOTS-based practicum model products produced for Basic Physics practicum activities as a 21st century practicum model, have the following characteristics: (a) based on constructivism theory, (b) oriented towards solving problems through practicum activities, (c) consisting of nine practicum activities which are included in three parts of the HOTS-based practicum model, namely: introduction, core, and closing, (d) Setting of activities is cooperative-collaborative, (e) digital data processing system. The use of the HOTS-based practicum model has high effectiveness in improving the HOTS skills of physics teacher candidates. The use of the HOTS-based practicum model in Basic Physics practicum activities received positive responses from all test subject students implementing the HOTS-based practicum model in Basic Physics practicum activities.