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Development of a Problem-Based Learning (PBL)-Based E-Book on Kodular to Improve Students' Cognitive Abilities

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Abstract

The rapid development of information and communication technology demands a transformation in education, particularly in the provision of adaptive, flexible, and innovative learning media and resources. One field of study significantly impacted by this technological advancement is Informatics at the high school (SMA) level. In today's digital era, students are required to understand informatics concepts theoretically and then be able to apply practical skills in application development, one of which is through visual programming platforms like Kodular. The objectives of this research are (1) to produce an e-book based on problem-based learning on Kodular application material to improve students' cognitive abilities; (2) analyzing the feasibility, practicality, and effectiveness of problem-based learning-based e-books on codular application materials to improve students' cognitive abilities.

The research method used is research and development (R&D). This research was conducted to produce a useful and enjoyable learning e-book. The e-book to be developed in this research is " Development of a Problem-Based Learning (PBL)-Based E-Book on Kodular to Improve Students' Cognitive Abilities" in class XI informatics. The research design is ADDIE, which stands for Analysis, Design, Development, Implementation, and Evaluations. At the implementation stage, the e-book was carried out in 27 class XI students of SMA Negeri 2 Blora, as well as other public high schools in Blora. The determination of the experimental group and the control group was done randomly, which is commonly referred to as random assignment. The results of the random assignment indicated that 27 eleventh-grade students from SMA Negeri 2 Blora served as the experimental group, while the eleventh-grade students from SMA Negeri Jepon Blora in Blora Regency served as the control group. The data analysis used a description of the feasibility of the Kodular application e-book, its practicality, and its effectiveness in improving students' cognitive abilities.

The research findings include: (1) the Kodular application e-book has been produced; (2) the Kodular application e-book that has been developed is feasible to use and can be implemented by students in learning Kodular application material. The Kodular application e-book that has been developed is feasible to use and can be implemented by students in learning Kodular application material; (3) the Kodular application e-book that has been developed is practical to use and can be implemented by students in learning Kodular application material; and (4) the Kodular application e-book that has been developed is effective for students in learning Kodular application material.

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