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E-MODULE GUIDED DISCOVERY LEARNING MODEL IN THE HOTS-BASED INDEPENDENT LEARNING CURRICULUM

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Abstract

Student's difficulties in learning mathematics independently are due to the lack of media that supports the learning process and is practical in use and the lack of freedom to choose their preferred field. The aim is to develop teaching materials in the form of an e-module guided discovery learning model in the HOTS-based independent learning curriculum. The steps of the Guided Discovery Learning Model used in the e-module are the steps according to Polya, namely: (1) understanding the problem; (2) making plans; (3) implementing the plan; (4) looking back or checking again. This type of research is Research and Development (RND), using development steps according to Borg & Gall, which Sugiyono has transformed. The development steps are limited to seven degrees. Among them; are potential and problems, gathering information, product design, product validation, product improvement, product testing, and product revision. The final result is the percentage of design expert validation getting valid criteria. Moreover, the results of student responses obtained exciting measures. As well as the results of student responses obtaining interesting criteria so that e-modules are feasible to be developed for learning materials

Keywords: E-Module, Guided Discovery Learning, HOTS, Independent Learning Curriculum

Abstrak

Kesulitan siswa dalam belajar matematika secara mandiri karena kurangnya media yang mendukung proses pembelajaran dan praktis dalam penggunaan serta kurang kebebasan untuk memilih bidang yang mereka sukai. Tujuan dari penelitian ini untuk mengembangkan bahan ajar berupa e-module guided discovery learning model in the HOTS based independent learning curriculum. Langkah-langkah Guided Discovery Learning Model yang digunakan dalam e-modul, sesuai dengan langkah menurut Polya, yaitu: (1) memahami masalah; (2) membuat perencanaan; (3) melaksanakan rencana; (4) melihat kembali atau mengecek kembali. Jenis penelitian ini adalah Research and Development (RND), menggunakan langkah-langkah pengembangan menurut Borg & Gall yang telah ditransformasi oleh Sugiyono. Langkah-langkah pengembangan dibatasi menjadi tujuh langkah. Diantaranya; potensi dan masalah, mengumpulkan informasi, desain produk, validasi produk, perbaikan produk, uji coba produk, revisi produk. Adapun hasil akhir persentase dari validasi ahli desain mendapatkan kriteria valid. Serta hasil respon peserta didik memperoleh kriteria menarik sehingga e-modul layak dikembangkan untuk bahan pembelajaran.

***Kata kunci**: E-module, HOTS, Kurikulum Merdeka Belajar, Penemuan Terbimbing.*

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INTRODUCTION

In the current technological era, learning should be digital-based. Adopting technology in implementing teaching and learning activities in schools has been shown to have many positive impacts (Darmayanti, Baiduri, & Sugianto, 2022; Suherman et al., 2021; Vakaliuk et al., 2020). One of the technologies widely accepted in education is e-books (electronic books).

Several studies related to e-books state that e-books are efficient and practical for learning (Darmayanti, MM Effendi, Hasanah, et al., 2022; Fadillah et al., 2021; Rasiman & Pramasdyahsari, 2014; Zhang et al., 2020). However, from these studies, no one has yet developed an Android-based E-book, especially on congruence material in grade VII junior high schools.

Even based on data in the field, 98% of students have an android smartphone. Therefore, it is necessary to develop an android-based e-book with the hope that the learning process can be more practical and effective. One uses an adaptive and innovative curriculum (Costa et al., 2021; Rohadi, 2017). This is very necessary as an effort to provide uncomplicated freedom and autonomy so that students are given the freedom to choose the fields they like. The Freedom to Learn Curriculum has various extracurricular learning (Amalia et al., 2022; Bahri, 2022; Darmayanti et al., 2022; Suhartoyo et al., 2020).

Efforts that can help learning to be fun are teaching materials in the e-modules, which contain learning exercises and questions that empower them to design knowledge of concepts. The exercises provided contain steps to arouse students' interest, starting with introducing logical problems. Students recognize their problems and what happened. E-modules that contain these facilities are based on the Discovery Learning Model. The discovery learning model understanding is appropriate to be applied in working on students' understanding of numerical ideas in tracing their ideas in a material (Choirudin et al., 2021; Dewi & Suniasih, 2021; Hidayati et al., 2019).

RESEARCH METHOD

The method used Research & Development (RND) using Borg & Gall's model, which was adapted from (Sugiyono, 2017). There are ten steps in research and development, but researchers simplify the seven steps, including identifying potentials and problems, gathering information, product design, design validation, design improvement, testing, and revision (Gall et al., 2014). The research model can be seen in Figure 1.

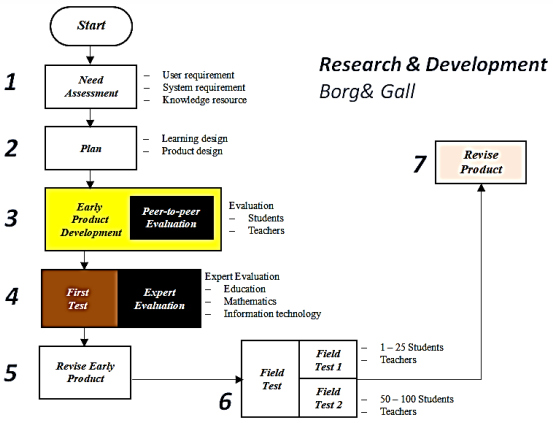

Figure 1. Borg & Gall's Model

In the development of e-modules, the products' validity, attractiveness, and effectiveness are seen. The e-module validity was evaluated by design experts, linguists, and material experts. While effectiveness is evaluated to see the achievement of learning objectives or indicators

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obtained through authentic assessments carried out during the learning process and tests of student learning outcomes after completing the learning process.

This research developed an e-module guided discovery learning model in the HOTS-based independent learning curriculum. The test subjects in this study were Assyfa Learning Center Foundation students, totaling 30 students. Data collection techniques used were interviews and questionnaires. Researchers used interviews as a data collection technique to conduct preliminary studies to know the problems that occur and must be investigated (Sugiyono, 2017).

The analysis technique used in the student response questionnaire also uses a Likert scale. The questionnaire consists of 4 alternative answer choices according to each statement's content.

RESULT AND DISCUSSION

Result

The development in this study only creates an e-module guided discovery learning model product in the HOTS-based independent learning curriculum. The research did not reach the trial use and mass production stage. This is because researchers only want to know the feasibility of the product based on validation tests from design experts, material experts, and linguists, and student response questionnaires to the developed e-module. According to the procedure in the research, the seven development, namely:

Potential and Problems

The potential contained in the research is to develop an e-module guided discovery learning model in the HOTS-based independent learning curriculum. Assyfa Learning Center Foundation is a school with an Islamic background. The choice of level or class was chosen because it adjusted to the primary material in the resulting e-module, namely the similarity of class VII. The goal is that students still remember clearly what similarity is. In addition, the Assyfa Learning Center Foundation has implemented an independent learning curriculum. So the development of the e-module guided discovery learning model in the HOTS-based independent learning curriculum with the Polya step has the potential to be applied easily to students.

Problems that exist in the field, students tend to be unmotivated with e-modules at school. This is because the existing e-modules are good, but there are only a summary of the material and pages of questions, and they are in black and white. So that students are less interested and reluctant to understand the material. At this stage, a needs analysis is essential as a material consideration to produce a product to be developed.

Data collection

After identifying problems and potentials is complete, the next step is collecting data. Data collection is essential to determine the needs of students for products developed through development and research. The first stage is to manage the problems in the Assyfa Learning Center Foundation by conducting interviews with mathematics teachers and students, especially class VII. The next step is to collect reference materials or sources for compiling the mathematics e-module for class VII and journals related to developing the e-module guided discovery learning model in the HOTS-based independent learning curriculum.

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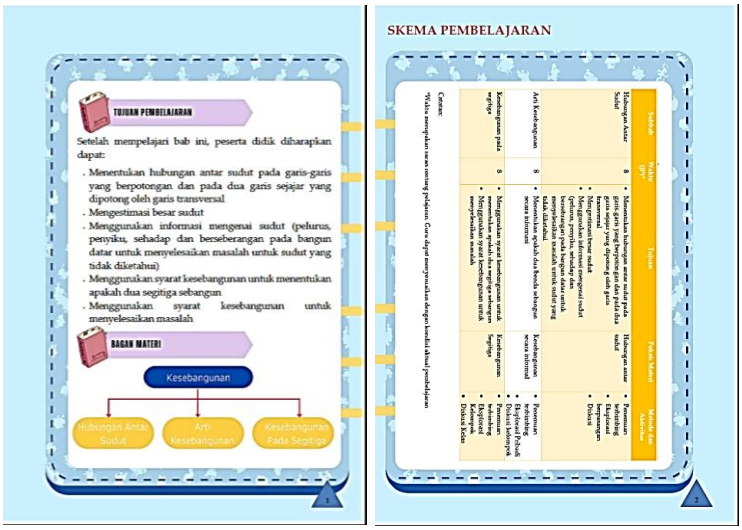
Product Design

After all the data has been collected, the next step is to plan the design of the e-module guided discovery learning model in the HOTS-based independent learning curriculum. The method of this e-module adapts to Learning Objectives, Material Charts, Learning Schemes, and Learning Activities. In this study, researchers applied the guided discovery model using the steps according to Polya, where in answering questions, students were directed to complete four stages, namely understanding the problem, making plans, implementing plans, and seeing or checking back. Using A4 paper; 1.5 spacing scale; Forte font, Comic San MS, Times New Roman, Berlin Sans FB Demi, features real-life images that relate to similarities, and each page has a different mix of colors to attract students. Product design in e-module development consists of outer and inner covers, a preface, a table of contents, core competencies, essential competencies, indicators, learning objectives, and learning schemes in Figures 2 and 3.

Figures 2 and 3. The Outer and Inner Cover of the E-Module



Figures 4 and 5. Learning Objectives and Scheme E-Module

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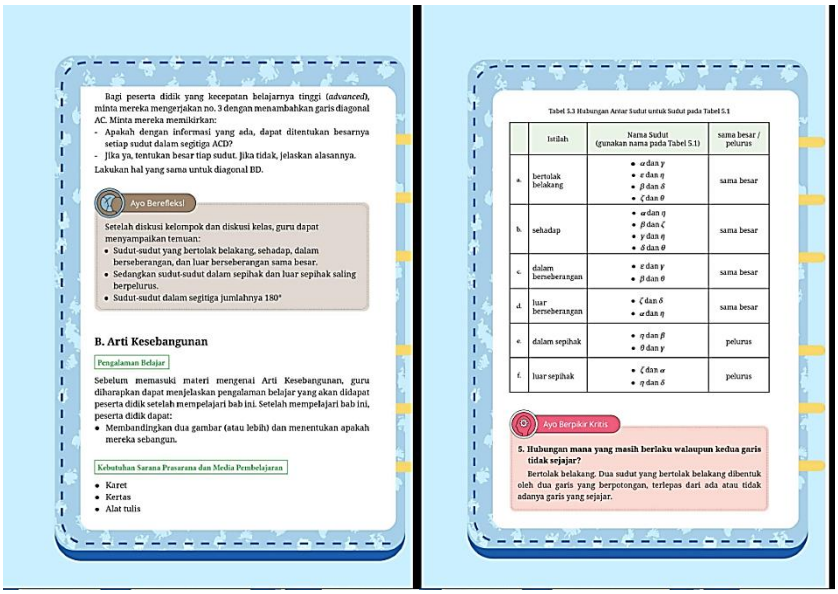
Figures 4 and 5 in the e-module explain the guided discovery model according to Polya. There are examples of problems and how to solve HOTS-based issues, the problems that exist in the e-module load in everyday life in society, and to solve these problems, participants are directed to fill out the steps in the e-module. The goal is for students to find out with the instructions given in the e-module and think critically by finding problem-solving by themselves.

In addition to guided discovery, the e-module provides steps in implementing discussion, communication, collaborative activities, and using technology so that students can hone their abilities through the Pancasila Student Profile in Figures 6 and 7.



Figures 6 and 7. Guided Discovery Learning and Profile of Pancasila Students

Design Validation

In the research and development of the e-module that has been designed, the next step is to be validated by a validator consisting of a design expert validator, validator, and material expert validator. The validation instrument uses a Likert scale of four combined questions to form a score or value. The validation assessment in this study uses a range of scales: very good = 5, good = 4, enough = 3, less = 2, and significantly less = 1 (Darmayanti, et al., 2022).

The average percentage results of design expert validation containing four assessment aspects, namely 75% in the excellent category, and the material expert validation result managing four elements of the assessment, namely obtaining an average percentage of 80% in the excellent category.

Design Improvements

After the product design was validated by design experts, linguists, and materials experts in the first stage, the researcher revised the product based on suggestions or input from the validators. The following are improvements to the e-module based on the validator's recommendations.

In the learning process, the teacher still dominates as the primary source (teacher-centered) through the lecture method, explaining the material

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in the book without involving students in learning (Darmayanti, Baiduri, & Inganah, 2022; Keiler, 2018; MM Effendi et al., 2022). Teachers only use printed books from publishers and have not developed Student Worksheets that are by the characteristics of mathematics learning. The e-module used is not by the requirements for making the e-module because it is only a set of questions with a little summary of the material and the lack of use of books in the library.

Trials

E-modules that experts have validated are then tested on a sample of students of Class VII Assyfa Learning Center Foundation, totaling 30 students. The results of the student response questionnaire. The results of the student response questionnaire as a whole obtained an average of 3.1 with exciting criteria.

Trial Repair

After obtaining the results of the questionnaire responses from participants who received exciting results, the improvement phase of the trial was not retested so that the e-module could be used as a learning resource for students and educators in junior high school on the similarity material for class VII.

Discussion

In learning activities, educators must be able to create learning activities that are more directed so that students can easily participate in learning activities and have a high interest in learning that educators can use in order to achieve learning objectives (Darling-Hammond et al., 2020; Keiler, 2018; Subandi et al., 2018). One uses an adaptive and innovative curriculum (Costa et al., 2021; Rohadi, 2017). This is very necessary as an effort to provide uncomplicated freedom and autonomy so that students are given the freedom to choose the fields they like. The Freedom to Learn Curriculum has various extracurricular learning (Amalia et al., 2022). The Merdeka curriculum contains more optimal lessons, so students have enough time to explore the lesson concepts and strengthen their abilities. With this curriculum, teachers can choose various teaching tools to suit our learning needs and interests as students.

Student's difficulties in learning mathematics independently are due to the lack of media that supports the learning process and is practical in use. Many of the LKPDs and modules developed are still in printed form, so their existence is still limited, and their use is less effective (Amalia et al., 2022; Lathifah et al., 2021; Purnawanto, 2022). So we need media that is used less to facilitate student learning both at school and outside school. Utilization of technology in learning mathematics can be utilized by utilizing technology as an effort to fulfill learning resources, fulfill data source facilities, and provide tools for various fields of practice.

Media that can facilitate students' learning of mathematics is an electronic module which is an essential tool in the learning process (Choirunnisya' & Sudira, 2021; Napoles et al., 2022; Prasetya, 2021). This e-module is specifically designed independently by the teacher because the teacher acts as a facilitator who facilitates student learning and students who are active in learning the material in the e-module. In learning exercises, educators introduce logical issues where the instructor can trigger students' interest in producing learning exercises by introducing

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context-oriented issues (Andi Mattoliang et al., 2022; Saaroh et al., 2021; Turidho et al., 2021). Learners are tested in dealing with problems introduced by themselves. This is seeing an idea or standard as it is examined. Students find it without being given it by the instructor. The logical problems introduced must also be related to the climate around students.

Limitations in the presentation of material and less-than-ideal learning systems cause students to experience problems in processing learning. Students find it challenging to get what is instructed by the teacher because the material used has not aroused their interest (Bhuana & Apriliyanti, 2021; Hasanah et al., 2022; Inganah et al., 2023; Sukmayadi & Yahya, 2020; Syaifuddin et al., 2022). This will make it challenging to build their insights on the ideas or standards being studied, so the ability to understand students' ideas is low.

To overcome the problems that occur, researchers want answers to overcome these problems. Overcoming these problems, it is necessary to plan a lesson in which this learning system can draw inspiration and interest from students to understand the learning they will learn. In addition, to work with learning systems, demonstration materials are needed that are ready to assist the learning system with the ultimate goal of training students' ability to understand mathematical concepts (Baiduri et al., 2020; Copur-Gencturk et al., 2020; Fauza et al., 2022; Sugianto et al., 2022; Wijaya et al., 2020).

Efforts that can help make the learning system fun are teaching materials in the form of e-modules, where e-modules contain learning exercises and questions that empower them to design knowledge of concepts. The exercises in the e-module that will be provided must contain learning steps aimed at arousing students' interest, starting with introducing logical problems, then, at that time, students who recognize themselves what problems occur with the teacher's direction. E-modules that contain these tools must be based on the Discovery Learning Learning Model. The learning model of discovery learning understanding is very appropriate to be applied in working on students' understanding of numerical ideas because this learning model expects students to be more dynamic in tracing their ideas or the rules they learn in a material.

CONCLUSION AND SUGESTION

According to Borg and Gall, the e-module guided discovery learning model in the hots-based independent learning curriculum was developed through steps. The validation results of design and materials experts get an excellent category, meaning that the e-module is feasible to develop. The student response questionnaire results as a whole obtained exciting criteria. This means that no re-testing is carried out, and the e-module can be used as a learning resource for students and teachers in SMP/MTs on the similarity material for class VII.

The development of this media was only carried out in 7 stages, so it is suggested that other researchers be able to maximize the use of this media for the implementation and dissemination stage in class VII students of junior high school.

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