(RESEARCH ARTICLE)

The development of a geography teaching module on disaster mitigation based on gorontalo local wisdom on the topic of disaster in 11th Grade at SMA Islam Terpadu Moosalamati, Gorontalo City, Indonesia

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Abstract

The low knowledge ability of students affects learning outcomes. Students need teaching modules that are directly related to their surrounding environment so that they can stimulate and stimulate student learning activities. The purpose of this research is to produce a geography learning module based on Gorontalo local wisdom with a focus on disaster material. Gorontalo local wisdom is an idea in the form of customs, rules, culture, language, beliefs and daily habits; this needs to be taught to students, especially the Gorontalo community in mitigating disasters. Research and development method. researchers use research and development steps according to Thiagarajan (1974) which is abbreviated as 4D, namely define, design, development and dissemination. The results of the validity of the Gorontalo local wisdom-based disaster mitigation geography teaching module from the aspects of content feasibility, graphical presentation, language with a very valid category. This shows that the module that has been developed has qualifications worth using.

Keywords: Geography Teaching Module; Disaster Mitigation; Gorontalo Local Wisdom; Thiagarajan

1. Introduction

The curriculum occupies a pivotal role in the field of education (Ramadan & Imam Tabroni, 2020). It functions as a foundational framework that directs the trajectory of educational processes (Aransyah et al., 2023). In Indonesia, the first curriculum was developed in 1947. By 2022, the Indonesian curriculum had undergone several revisions. The authority to amend and establish the curriculum lies with the Ministry of Education, Culture, Research, and Technology of Indonesia. These revisions are driven by the continuous evolution of knowledge, politics, economics, society, culture, and technology. The most recent introduction of a new curriculum is the "Kurikulum Merdeka," or Independent Curriculum, which was spearheaded by the Minister of Education, Culture, Research, and Technology, Nadiem Anwar Makarim.

The Independent Curriculum is founded on four principles, which have been reformulated into new policy directives (Izzah Salsabilla et al., 2023). First, the National Standardized School Examination (USBN) has been replaced by assessment exams (Fadhilah Putri & Maula, 2024). This modification is intended to assess students' competencies through written tests or alternative forms of assessment, such as project-based assignments. Secondly, the National Examination (UN) has been replaced by a Minimum Competency Assessment (AKM) and a Character Survey (Marlina, 2023). These initiatives are designed to motivate educators and schools to enhance the quality of learning and selection tests for students advancing to higher levels of education. The Minimum Competency Assessment encompasses literacy, numeracy, and character. The fourth salient point pertains to the shift from a standardized format for lesson plans (RPP) to a more flexible approach in the Independent Curriculum, which empowers educators to devise, employ, and evolve

lesson plan formats according to their discretion. However, it is imperative to note that these plans are required to adhere to the three core components: learning objectives, learning activities, and assessments (rahimah, 2022).

A module is defined as an instructional material that is systematically developed based on a specific curriculum and structured as the smallest unit of learning (Auwaliyah et al., 2023). Modules facilitate independent learning by students within a designated timeframe, enabling them to master the competencies being taught. Teaching modules serve as an application of learning trajectory frameworks (ATP) developed based on learning outcomes (CP), with the profile of "Pancasila Students" as the ultimate target. The development of teaching modules is aligned with the developmental stages of students, considering the subject matter to be learned, learning objectives, and focusing on long-term growth (Maulida, 2022).

Local wisdom refers to the ideas that emerge and evolve continuously within a society, encompassing customs, norms, or regulations, culture, language, beliefs, and daily practices (Baruadi, 2019). Local wisdom is an integral part of a society's culture and cannot be separated from the community itself. It embodies the values held by the society, forming a significant part of their identity.

The values of Gorontalo's local wisdom are limited to the aspect of knowledge. Consequently, in geography education, there is a necessity for a module that functions as an intermediary between disaster-related geography content and the local wisdom of the Gorontalo community (Suly Eraku et al., 2020)

To address this issue, an initiative has been undertaken to design a teaching module that emphasizes disaster-related topics, particularly disaster mitigation based on Gorontalo's local wisdom. This module integrates disaster material and mitigation efforts in alignment with the local wisdom of Gorontalo. A salient benefit of the developed module is its specificity in presenting the material. The necessity for alternative teaching modules, such as the one presented here, that utilize learners' environmental conditions as a source of learning, is a key finding of this study.

2. Methods

The present study employs the Research and Development (R&D) method, which, as Sugiyono (2019) notes, serves as a scientific approach to investigate, design, produce, and test the validity of the resulting product. Maydiantoro (2021) states that R&D is a research method used to develop and evaluate products, which are commonly created within the field of education. The present study employed the 4D model, proposed by Thiagarajan (1974), which encompasses the following steps: 1) Define, 2) Design, 3) Development, and 4) Dissemination (Thiagarajan, 1974).

The scope of the research was confined to the Development stage, and the findings were subjected to a trial implementation. The subjects of this study were 20 students from the 11th grade of SMA Islam Terpadu Moosalamati, Gorontalo City. The collection of data was facilitated by the administration of questionnaires to the students and the utilization of validation sheets. The subsequent analysis of the data was conducted through the implementation of validity testing techniques. The objective of this research was to develop a geography teaching module on disaster mitigation based on Gorontalo local wisdom for disaster-related materials.

The validity of the developed product was assessed based on media validity and content validity. Content validity encompassed the necessity for intervention and design, grounded in the knowledge of Gorontalo's local wisdom. Media validity was assessed through the evaluation of graphical coherence and the appropriateness of language. The product's validation was determined by its alignment with these established criteria. The validation process entailed the review of two media validators and one subject matter expert validator. The validation results were then subjected to analysis, which entailed the calculation of the percentage of validity and its subsequent categorization according to the established validation criteria (see Table 1 for a detailed presentation of these criteria).

$$Va = \frac{TSe}{TSh} \times 100$$

Description:

Va   : Validation Sheet
Tse   : Total Empirical Score
TSh   : Maximum Score on the Validation Sheet

Table 1 Validation Criteria

No.	Validation Criteria	Validation Level
1	85,01% - 100,00%	Very Valid
2	70,01% - 85,00%	Vald
3	50,01% - 70,00%	Moderate
4	01,00% - 50,00%	Not Valid

Source: Akbar, (2013)

3. Results and Discussion

The following section presents the findings of research conducted on the development of a geography teaching module for disaster mitigation based on Gorontalo's local wisdom. The research followed the 4D development procedure and was conducted in two stages: (1) the development stage of the teaching module and (2) the implementation stage (classroom trials).

3.1. Steps Conducted During the Define Stage

3.1.1. Curriculum Analysis

The objective of the curriculum analysis was to ascertain which competencies would serve as the foundation for module development. In this process, the researchers engaged in discussions with the school principal and teachers at SMA Islam Terpadu Moosalamati, Gorontalo City. These discussions were conducted with the objective of identifying challenges or difficulties encountered during the implementation of the Independent Curriculum. The findings revealed a lack of student motivation, partly due to the boarding school environment, and the teaching modules in use did not incorporate the local wisdom surrounding the students' environment.

3.1.2. Learner Analysis

Learner analysis was conducted to examine the characteristics of the students, which served as a foundation for developing the teaching module. The researchers identified the students' behaviors and characteristics by gathering information about their prior abilities through diagnostic assessments or discussions with the homeroom teachers involved in the study. The findings from these discussions indicated that the students' abilities were generally below average. This finding served as the foundation for the subsequent design of the teaching module.z

3.1.3. Material Analysis

Material analysis was carried out on the textbooks commonly used in the learning process to assess the content, particularly the topics to be included in the teaching module. The objective of this analysis was to identify key concepts that would be summarized and incorporated into the module.

3.2. Steps Conducted During the Design Stage of the Teaching Module

The objective of this stage was to design high-quality instructional tools capable of fostering critical thinking skills in students. The emphasis was placed on the structuring of the teaching module in accordance with the components delineated in the systematic framework of the prevailing Independent Curriculum teaching module.

3.2.1. Designing Assessment Tests for Learning Objective Achievement Criteria

At this stage, researchers developed written test items that would be completed by students to determine their final scores based on the criteria for achieving learning objectives. The construction of these test items was informed by the curriculum to be incorporated within the 4D model teaching module.

3.2.2. Media Selection

The focal point of this activity was the identification of the most suitable learning media to be utilized in the instruction of disaster-related subjects to 11th-grade students. The media selected by the researchers encompassed printed materials, resources created using the Canva software, and the surrounding environment.

3.2.3. Initial Design

The initial design of the learning tools included a school calendar, annual program, semester program, learning trajectory framework, teaching module, learning materials, student worksheets, and assessments. The teaching module was composed of three categories of components: general, core, and appendices. The learning activities were structured around an inquiry-based model, an approach that emphasizes the development of skills in critical and creative thinking through exploration and investigation.

3.3. Steps Conducted During the Development Stage (Validation Testing)

3.3.1. Media and Content Validation

In the Four-D model, the validation and assessment of the teaching module product were integral to the development stage. The objective of this validation process was to ascertain the suitability of the developed teaching module's design or draft for its intended use. To this end, the project involved the involvement of expert validators in media and content. The media validation process entailed an evaluation of graphical coherence, while the content validation focused on whether the material addressed the needs of the curriculum and aligned with Gorontalo's local wisdom. The outcomes of the media validation process are illustrated in Figure 1.
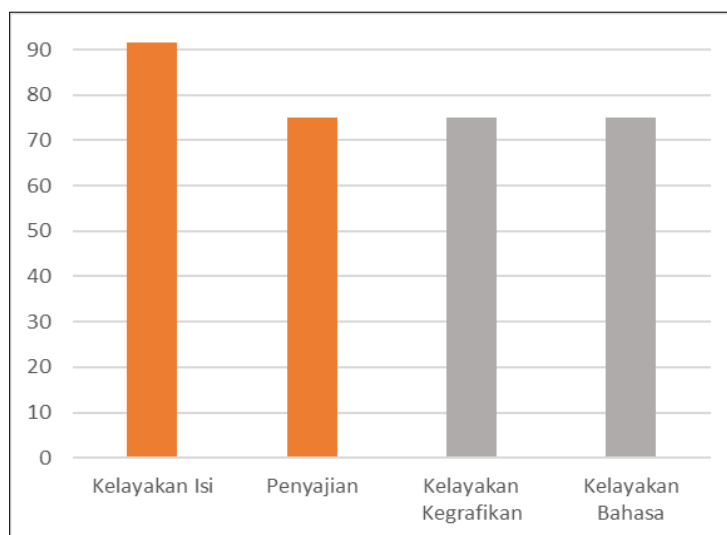

Figure 1 Media and Material Validation

The validity of the disaster mitigation teaching module based on Gorontalo local wisdom was evaluated with an average score from two validators across four aspects, as shown in Figure 3.1. The findings revealed that the content feasibility aspect received a score of 91%, which was categorized as "very valid", the module presentation received a 75% score, falling into the "valid" category, and the graphical and linguistic feasibility of the module yielding a score of 75% and a categorization as "valid." These validation percentages collectively indicate that the geography teaching module for disaster mitigation based on Gorontalo local wisdom is suitable for use, with the implementation of minor revisions recommended.

3.3.2. Practicality of the Teaching Module (Student Responses)

The practicality of the teaching module was assessed through a limited trial with a group of students. During this trial, researchers used student response sheets as the instrument to evaluate the module's effectiveness. The trial was conducted over seven sessions, and observations focused on the students' reactions and engagement with the developed teaching module. The student responses are illustrated in Figure 3.2.
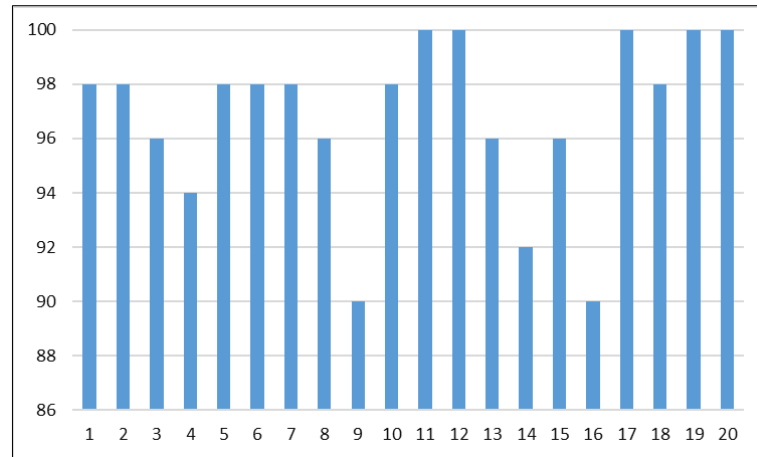
Figure 2 Students' Responses

An analysis of Figure 3.2 reveals that student responses to the teaching module were overwhelmingly positive. The data show that five students provided the highest score of 100%, indicating an excellent response. Conversely, the lowest recorded score was 90%, which was given by two students. These results indicate that the teaching module received a "very good" rating from all students based on the evaluated criteria. The module's layout and presentation are depicted in Figure 3.3.
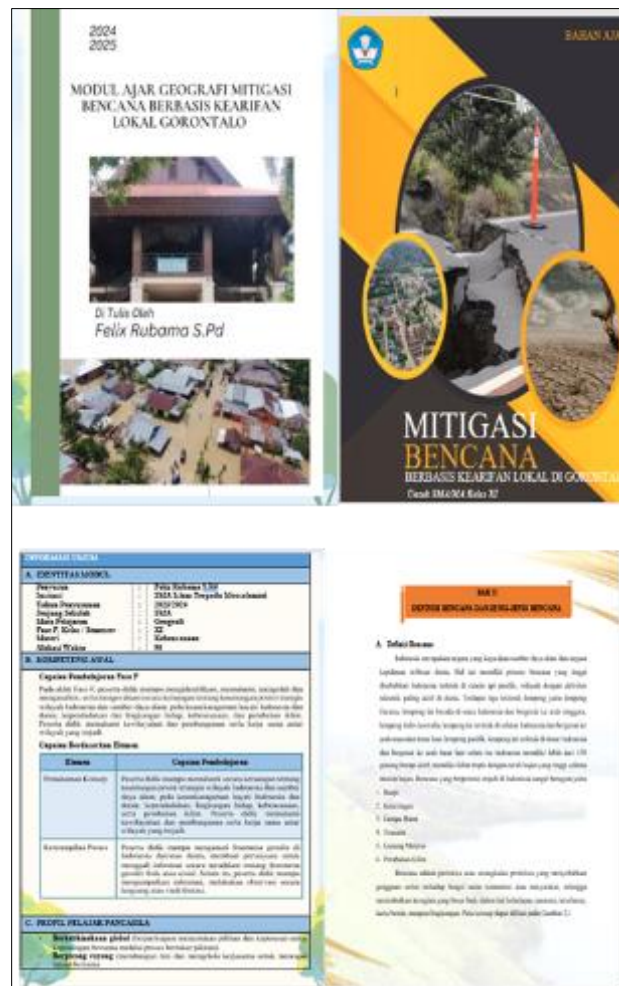

Figure 3 Layout of Module and Teaching Materials

3.3.3. Effectiveness (Learning Outcomes)

An experiment was carried out at SMA Islam Terpadu Moosalamati to evaluate the efficacy of the devised instructional module on disaster mitigation grounded in Gorontalo local wisdom. The effectiveness of the module was measured using a written test administered at the conclusion of the trial sessions to ascertain whether there had been an improvement in student learning outcomes.

The results of the written test, completed by 20 students in grade XI, demonstrated a significant improvement in learning outcomes. The number of students who demonstrated mastery is 15 (75%), while the number of students who did not achieve mastery is 5 (25%). These results indicate that the implementation of the teaching module on disaster mitigation based on Gorontalo local wisdom has led to a substantial enhancement in student learning outcomes. The detailed learning results are presented in Table 2.

Table 2 Students' Learning Outcomes

Category	Number of Students	Percentages (%)
Achieved Mastery	15	75
Did Not Achieve	5	25
Total	20	100

Source: Primary data

4. Conclusion

- The module's feasibility was assessed through the implementation of validity tests, focusing on two key aspects. First, media validity achieved a score of 75%, categorized as "valid." Second, content validity with a score of 94%, categorized as "very valid." The findings of this evaluation suggest that the module is suitable for utilization.
- The practicality of the module was assessed through a trial conducted with grade XI students at SMA Islam Terpadu Moosalamati. The evaluation of the module was conducted using a structured questionnaire, and the responses from the students indicated a "very good" rating.
- The efficacy of the teaching module in enhancing student learning outcomes was substantiated by empirical evidence. In the preliminary trial, 17 out of 20 students (85%) attained mastery, thereby evidencing substantial advancements in learning outcomes.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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