

Development of Differentiated Learning Model Based on Gamification for Elementary School Children

Otto Fajarianto¹, Dwi Wulandari², Arbin Janu Setiyowati³, Qurrota Ayunin^{4*}, Sinta Dewi Maryam⁵, Salsabella Qurrota Ayunin⁶, Affero Ismail⁷

Malang State University, Malang, Indonesia^{1,2,3,4,5,6}

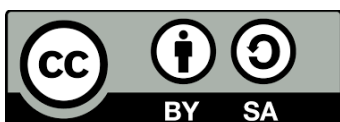
Universiti Tun Hussein Onn Malaysia, Johor, Malaysia⁷

otto.fajarianto.fip@um.ac.id¹, dwi.wulandari.feb@um.ac.id², arbin.janu.fip@um.ac.id³,
qurrota.ayunin.2331137@student.um.ac.id^{4*}, sinta.dewi.23100436@student.um.ac.id⁵,
salsabella.qurrota.23260735@student.um.ac.id⁶, affero@uthm.edu.my⁷

Abstract

Differentiated learning is an effort to adapt the learning process to the learning needs of each student. Education in Indonesia, through the independent curriculum, is starting to introduce a lot of student-oriented learning. So there needs to be an appropriate learning approach that can be applied to learning activities. So the aim of this research is to evaluate previous scientific research articles related to differentiated learning in elementary schools (SD). In order to examine the usefulness of the differentiated learning approach in elementary schools (SD). In this article, the research method used is a literature review. The research data used are articles published within the last 5 years, namely between 2019 and 2023. As well as at the elementary school (SD) education level. This research stage was carried out by searching the literature with the keyword "Differentiated Learning" with findings of 6,280 articles. Then data selection was based on criteria according to the year of publication and research topic, namely differentiated learning at elementary school (SD) level, where 16 articles were obtained. Next, analyze the data as well as interpret and write the results and conclusions of the data analysis. Based on the results of the literature review analysis, it can be concluded that teachers can implement differentiated learning in the classroom well by providing a good understanding of differentiated learning. Then the benefit of implementing differentiated learning is that it can facilitate the diversity of students' learning needs based on learning styles. The application of differentiated learning has the potential to improve students' academic achievement and interest in learning. The application of differentiated learning in the classroom can also improve 21st century skills and support the implementation of independent learning.

Keywords: Learning, Differentiated, Elementary School



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INTRODUCTION

Actually, every individual possesses unique characteristics. The same applies to every student in a classroom. They have different uniqueness and needs from one another. Teachers must pay attention to each student who has different characteristics and potentials. Student diversity can be seen from three aspects: readiness to learn, learning style, and learning profile. (Tomlinson, 2013). It is important for a teacher to understand student diversity in order to create effective and quality learning (Widiasworo, 2020).

Learning is an important element in the implementation of education. In line with the advancement of the world of education, learning also presents a new paradigm that provides teachers with the flexibility to design learning activities and assessments that are in accordance with the characteristics and needs of students. The implementation of this learning ensures that activities are student-centered, starting with mapping competencies, planning, and implementing assessments to improve learning activities in achieving the expected goals (Kemendikbud, 2021). One learning method that places students as the main focus and supports the diversity of children's characteristics is differentiated instruction.

Differentiated instruction is an effort to adjust teaching methods to the individual learning needs of each student. When teachers respond to students' learning needs, it means they have implemented differentiated instruction by adding, expanding, and adjusting learning activities to obtain maximum learning outcomes. Differentiated instruction recognizes that each student has unique and different learning needs. (Lestaningrum, 2022). Along with the implementation of the independent curriculum, many driving elementary schools (SD) have implemented differentiated instruction. The focus of the literature review conducted is research on differentiated instruction in elementary schools (SD).

RESEARCH METHODS

In this article, the R&D (Research and Development) research method is used. The R&D research method employed in the development of a gamification-based differentiated learning model for elementary school children involves several important stages. The research stages carried out are as follows:

The first stage is analysis. In this analysis stage, the researcher conducts: a) Initial Needs Analysis regarding the characteristics of students at SDN Kiduldalem 02 Malang. The needs analysis steps taken include: (1) Needs Analysis Survey on the characteristics of students at SDN Kiduldalem 02 Malang. (2) FGD on the results of the needs analysis. (3) Literature review analysis related to the characteristics of students at SDN Kiduldalem 02 Malang. Through these steps, researchers can identify students' strengths and weaknesses, as well as determine the most appropriate learning strategies. The results of this analysis will serve as the basis for the development of an effective and relevant learning model, thereby improving the quality of learning at the school.

The second stage involves design. This stage results in the design of a gamification-based differentiated learning model for elementary school children, carried out through: a) Developing a conceptual framework for a gamification-based differentiated learning model for elementary school children; b) Designing learning scenarios or teaching and learning activities; c) Planning an initial draft of learning materials based on the conceptual framework of the model; d) Designing learning materials and learning evaluation tools using the gamification-based differentiated learning model; e) Designing a storyboard for the gamification-based differentiated learning model; (f) Initial revision of the storyboard design for the gamification-based differentiated learning model.

The third stage is development. This stage produces a gamification-based differentiated instruction (DIGI) learning model for elementary school children that can provide information about students' self-image. a) Developing a prototype of the

gamification-based differentiated learning model for elementary school children, including (lesson plans, media, teaching materials, worksheets, and assessment instruments appropriate to the characteristics of elementary school students). b) Producing or revising the learning model that will be used to achieve the formulated learning objectives. c) Revising the prototype of the gamification-based differentiated learning model.

The fourth stage is implementation. This stage involves the implementation of the gamification-based differentiated learning model for elementary school children. The steps taken include: a) Testing and implementing the gamification-based differentiated learning model; b) Assessing the feasibility of the gamification-based differentiated learning model; c) Revising the gamification-based differentiated learning model.

The fifth stage is evaluation, where the results of the development of the gamification-based differentiated learning model are evaluated. The steps taken include: a) Evaluating student characteristics; b) Evaluating the effectiveness of the gamification-based differentiated learning model; c) Conducting dissemination of gamification-based differentiated instruction.

RESULT AND DISCUSSION

The differentiated learning model developed in this research integrates various approaches to meet the diverse learning needs among students. This model includes adjustments in methods, materials, and assessment, as well as providing choices to students in how they learn. The differentiated learning model is presented in a teaching module that has been developed by the researcher. The developed differentiated learning model applies the discovery learning method adapted to the Natural and Social Sciences (IPAS) subject matter on "Sound and Its Properties." The strategy used is experimentation. By conducting experiments, students are given a choice of learning activities tailored to visual, auditory, and kinesthetic learning styles. The development of this learning model is packaged in a gamification-based learning media application product.

The product generated in this research is a gamification-based differentiated learning media application to enhance student engagement in learning. To test the validity level of the developed learning media, validation tests were conducted with experts. The following is a display of the product:



Figure 1. Application Initial Display



Figure 2. Application Menu Display



Figure 3. Material Access View

In this research, data was obtained from the results of completing instruments in the form of questionnaires given to two material experts to assess the feasibility of the gamification-based differentiated learning model for elementary school children that was developed. Before the respondents completed the provided assessment instruments, each respondent first conducted a trial of the developed Learning Media. The validation test results from media experts and material experts consisted of responses and assessments from both parties.

In this research, the answers to the instrument items were classified into five choices. Each measured indicator was given a scale score of 1-5, namely 5 (very good), 4 (good), 3 (fair), 2 (poor), and 1 (very poor).

The next step was to assess the feasibility of a learning media for implementation in elementary school children. After the data was obtained, the weight of each response was then analyzed, and the average score was calculated.

Table 1. Expert Validation Test Assessment Results

No	Assessment Aspects	V1	V2	Total Score	Max Score	%	Category
1.	Conformity of content and purpose	15	14	29	30	96,66	Very Worth It
2.	Quality of Learning	20	20	40	40	100	Very Worth It
3.	Utility	34	33	67	80	83,75	Very Worth It
	Total Overall Aspects	69	67	136	150	91,33	Very Worth It

The feasibility test conducted by material experts aimed to obtain results as well as suggestions and comments from expert validators so that the developed learning media becomes a high-quality product suitable for use in the learning process. The feasibility test conducted by media expert validators on the learning media can be seen based on the table above, which shows that the first validator gave the highest score of 34 for the usability aspect, while the lowest score was 15 for the content and objective suitability aspect. The second validator gave the highest score of 30 for the usability aspect and the lowest score of 14 for the content and objective quality aspect. From both validators, the average of each validator based on the assessment aspects from the two validators showed that the content and objective suitability aspect received 96.66%, the learning quality aspect received 100%, and the usability aspect received 83.75%. The average of these three aspects is 91.33%, which means this learning media is in the very feasible category.

CONCLUSIONS

Based on the results of the research and development that has been conducted, it can be concluded that the gamification-based differentiated learning media application is of high quality and can be categorized as very feasible for use in the learning process to increase student engagement in learning. According to the assessment of experts, it received a percentage of 97%. This score falls into the very feasible category, making this media suitable and ready for use.

The results of this research provide important implications for educational practice, especially in the implementation of differentiated instruction and the use of technology. Educators are expected to be able to adapt this model and utilize similar applications to enhance students' learning experiences and achieve better learning outcomes.

The application of technology in differentiated instruction enables more flexible and responsive teaching to student needs. By using gamification-based applications, teachers can more easily track student progress in real-time and provide timely feedback. This not only helps students who need additional support but also challenges more advanced students to continue developing.

Furthermore, it is important for educators to receive training and support in implementing technology in learning. Teachers' readiness to use technological tools and understand the principles of differentiated instruction will greatly influence the successful implementation of this model in the classroom. Therefore, professional development for teachers is key to ensuring that they can utilize these resources effectively.

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