# The Effectiveness of Interactive Android Modules through the Culturally Responsive Teaching (CRT) Approach Integrated with Differentiated Learning to Improve the Learning Outcomes of Junior High School Science Independent Curriculum Students

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**Abstract:** This research aims to analyze and explain the validity, practicality, and the effectiveness of interactive android modules through the CRT approach integrated with differentiated learning. Interactive android modules are designed to improve students' understanding so as to improve student learning outcomes. This type of research is research and development (R&D) using the ADDIE design which consists of five stages, namely analysis, design, development, implementation, and evaluation. Results obtained from this research that the validity of the interactive Android module is declared valid in terms of content eligibility, linguistic aspects and aspects of presentation and graphics. Practicality of interactive android module of teacher and student responses is stated for be very practical. The effectiveness of the interactive android module is stated it is quite effective in improving learning outcomes. Based on these findings research, it was concluded that the interactive android module was declared valid with an average score of 0.89. Practicality, it is stated to be very practical Based on the response of teachers with an average score of 0.95 and students response with a score of 0.91. The effectiveness of using the N-Gain test of 0.68 was stated to be medium to be used in improving learning outcomes.

**Keywords:** CRT; Differentiated learning; E-Module; Learning outcomes

## Introduction

Education in Indonesia is medium experienced rapid development, especially with the implementation of Curriculum-Independent that allows schools to adapt to changing times. Teachers and schools are given the freedom to create a curriculum that meets their requirements thanks to the Merdeka Paradigm Curriculum. The Merdeka Curriculum places greater emphasis on teacher modifications to the learning process than the previous curriculum, which was more centralized and consistent throughout all institutions (Rosadi & Andriyani, 2021). The Independent Curriculum promotes the idea of self-directed learning so that educators and educational institutions can create, modify, and execute a curriculum that is specific to each student's needs and abilities (Hartoyo & Rahmadayanti, 2022). This aims to make schools free to choose learning methods that are in accordance with the characteristics of their students (Manekung et al., 2024).

In the 21st century, innovations in technology happen quickly and are followed by adjustments.

Currently, digitalization is transforming many facets of human existence, including education (Ardiani, 2022; Darwin et al., 2020). The way the educational process is implemented is greatly impacted by technological advancements (Kuswanto, 2019; Siswanto et al., 2021). Ongoing changes are driving education towards sustainable transformation. The usage of currently utilized instructional materials is the most obvious aspect of technology advancements in education. Because they have been modified to reflect current advancements, the educational resources available on the internet are very engaging and diverse (Aryawan et al., 2018; Maharcika et al., 2021). Given these advancements, media is undoubtedly the best instrument to employ in the educational process. Media, which is everything that is communicated by the sender and the recipient with the goal of igniting students' thoughts, ideas, and interests to learn, is necessary because the implementation of learning must also be thorough when discussing a material (Hakim et al., 2018; Tafonao, 2018). Furthermore, with today's technology advancements, instructors may utilize them to create media in a more creative and original way, making the learning experience richer. Additionally, media is required as a tangible means of delivering messages to assist the implementation of learning (Made et al., 2023). One of the acknowledged barriers to learning at the junior high school level, particularly for pupils, is the limitations of learning material. Students' lack of interest and engagement in junior high school coursework is a result of inadequate media.

Among the science-related subjects covered in class VII are ecology and biodiversity, which are sub-topics that demand a deep comprehension of ideas. The sub-material, these include how the environment affects living things, how the elements that comprise the environment interact, and biodiversity protection, the distribution of Indonesia's plants and animals, and the impact of human activity on the environment (Kartika et al., 2023). The biological components of ecology and biodiversity are interrelated and need for sound thinking and information processing. If pupils struggle to comprehend, analyze, and rationalize these ideas (Sari & Alberida, 2022). A supportive environment and student engagement throughout the learning process are essential to meeting the scientific learning objectives. According to the student's cognitive learning results, the learning objectives have been successfully met (Nurhatimah, 2014).

One of the major challenges to learning at the junior high school level, particularly for kids, is the limits of learning material. Students' lack of interest and engagement during class is a result of media restrictions. Creating educational materials is one action that

educators may do in response to these issues. Solutions that may be applied to the issues that have been raised by using the advancements in technology as a learning aid, such as media or instruments to make the transmission of information easier (Aini, 2020). It is an attempt to enhance student learning outcomes and learning quality via the use of technology-based learning materials (Ainun & Wulandari, 2024).

Module creation is one option for facilitating a relevant learning system. Modules serve as a teaching tool that allows students to study on their own and develop certain abilities. They are prepared methodically using learning resources, exercises, assessments, and learning activities (Hamdani, 2011). As technology advances, printed modules can be transformed into electronic modules, which are instructional resources that are presented in an interactive, sequential, and structured way in an electronic format using text, images, sounds, and instructions to help users learn on their own and accomplish goals, learning as you see fit (Nurmayanti et al., 2015). Learning materials based on Android provide students additional chances to be engaged in their studies (Hidayat et al., 2023; Isrokatun et al., 2023). Furthermore, computer-based learning resources known as electronic modules provide students the chance to experiment with learning on their own by following the program's instructions (Arsyad, 2013). With the implementation of the E-modules are regarded innovative because they may show educational materials that are full, entertaining, interactive, and carry out good cognitive functions. In an attempt to enhance student learning outcomes and learning quality, modules are used to help students comprehend the knowledge that is delivered either independently or under the supervision of instructors using engaging module content and technology-based learning media (Hamid & Alberida, 2021; Hamid et al., 2020).

Teachers must pay attention to student diversity and develop knowledge and skills to help students compete in changing times. Culturally responsive teaching is a learning approach that can develop the potential for student diversity by exploring students' academic abilities and psychosocial abilities. Students in a class have diverse cultural backgrounds and characteristics, which makes it difficult for teachers to unite academic abilities, culture, and community needs in future social life. Unfortunately, teachers do not reflect diversity in classroom learning (Geneva, 2018). Teachers may use culturally responsive teaching to help students succeed academically (Edwards & Edick, 2013). Teaching that is sensitive to cultural differences gives lessons purpose and relevance to students' lives (Villegas & Lucas, 2007). Culturally responsive teaching

makes advantage of the traits and experiences of its students. This is predicated on the third premise, which states that students will acquire meaningful learning, be more engaged, and comprehend learning more readily when academic information and abilities are integrated into their everyday lives.

The use of varied ethnic students' cultural traits, experiences, and viewpoints as a more effective teaching tool is known as culturally responsive teaching. Many ideas explain the traits of culturally sensitive education. Specifically, a positive outlook on parents and families, communicating high standards, learning in the context of nine different cultures, student-centered education, culturally mediated instruction, curriculum redesign, and the role of the teacher as a facilitator (Ladson-Billings, 1994). Hernandez et al. (2013) provide a plan for creating a teaching-learning methodology that is culturally responsive teaching and tailored to the study of mathematics and the natural sciences. This learning strategy contains five key categories start from cultural integration in material content, knowledge formation, not prejudiced in diversity, social justice, academic progress (Anjaswuri et al., 2023). Integrated Science is one of the disciplines studied at the Junior High School/MTs. The sub-sciences of biology, physics, and chemistry are all part of integrated science and are related to one another (Hamzah, 2015). Science Learning It is preferable to aim for the development of all science learning domains cognition, process skills, applications, attitudes, and the growth of scientific creativity together (Dewi & Purwati, 2024).

This stage necessitates that students take an active role in their education in accordance with one of the characteristics of culturally responsive teaching, which is student-centered. This stage develops the soft skills of self-confidence, communicativeness, motivation, and responsibility. Culturally responsive teaching has several features, such as encouraging positive student interactions, student-centered learning, and learning that initiates the development of students' critical thinking attitudes. At the same time, teachers can use a culturally responsive teaching approach to help them integrate their students' cultural backgrounds into their lessons, as well as motivating and guiding students without making a distinction between their cultural backgrounds. Here, culture is defined as the customs, traits, and learning styles of students (Hernandez et al., 2013).

A teacher is a person who is appointed as the major subject and is regarded capable of acting as a motivator for pupils by carrying out acts that are plainly helpful for their students (Ainia, 2020). The teacher serves as the primary learning facilitator in the classroom. Educators who are more innovative in their approach to teaching will foster a more creative learning environment in the classroom. Students' needs can be met by using differentiated learning. Diverse activities are used in differentiated learning to examine pupils and consider their individual learning responses (Fauzia & Ramadan, 2023). Understanding and imparting knowledge based on the abilities and learning preferences of people with different personalities is possible through differentiated learning (Wahyuni et al., 2022). Because Indonesia is a nation with a significant amount of cultural variation, teachers may also address the requirements of their pupils by paying attention to their culture in addition to their learning preferences and character traits (Yonanda et al., 2023).

According to the above description, the researcher wants to ascertain whether media can be used for learning and present the findings of trials that are restricted to media. Additionally, the researcher wants to ascertain the efficacy of the interactive Android module using the culturally responsive teaching (CRT) approach combined with differentiated learning as an alternative solution to learning problems for junior high school students in science learning. In addition to the information and skills that may be acquired, research and development is utilized as a method to educate students how to collaborate with one another to solve issues that teachers present, work together, be accountable, and respect one another's viewpoints. Students will be actively engaged in their education through the use of interactive android module media.

## Method

This research applies research and development methods (R & D). Research and development is a method or strategy for conducting research to create new products or enhance current ones (Zakariah et al., 2020). The form of development carried out is an interactive android module. The development model used is the ADDIE model (Branch, 2009). The procedures that will be carried out are analysis, design, development, implementation, and evaluation as shown in Figure 1.
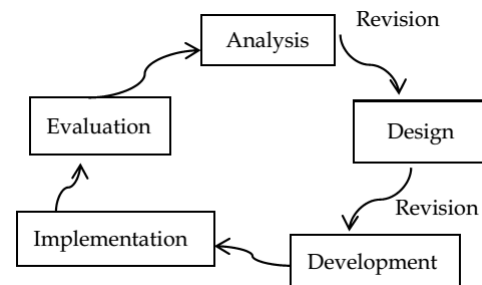


**Figure 1.** Stages of ADDIE development

The purpose of the analysis stage was to determine the challenges that students faced when learning science. The goal of the design stage is to create interactive Android modules that will be built in response to real-world issues. The development stage is a crucial stage before the learning media is tested on students. Finding out if the learning materials can enhance students' comprehension is another goal of the implementation stage. Lastly, the assessment step is required to identify the areas that require improvement from the previous stage.
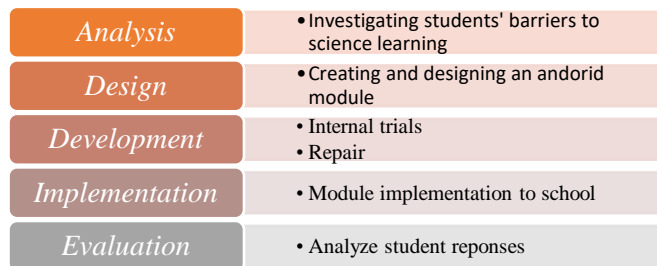


**Figure 2**. ADDIE model

The subjects of this study are 32 students grade VIII 3 at SMPN 16 Padang. Data collection the instruments in this study were used: (1) validation sheets, (2) implementation observation sheets, and (3) learning outcome ability test. Validation sheet works to find the validity of the developed product and the product improvement suggestions obtained from four validator. Functional implementation observation sheet to determine the practicality of the developed product filled by four science subject teachers. The learning outcome ability test is a test used to determine the effectiveness of a product in learning outcome requirements student.

**Table 1.** Validity Categories (Boslaugh & Watters, 2008)

| Interval | Categories |
|---|---|
| 0.81-1.00 | Very valid |
| 0.61-0.80 | Valid |
| 0.41-0.60 | Medium |
| 0.21-0.40 | Low |
| 0.01-0.20 | Very low |
| 0.00 | Not valid |

**Table 2.** Categories practicality (Boslaugh & Watters, 2008)

| Interval | Categories |
|---|---|
| 0.81-1.00 | Very high |
| 0.61-0.80 | High |
| 0.41-0.60 | Medium |
| 0.21-0.40 | Low |
| 0.01-0.20 | Very low |
| 0.00 | Not Practice |

**Table 3.** N-Gain Test Criteria (Sundayana, 2018)

| Correlation coefficient | Criterion |
|---|---|
| $0.70 \leq g \leq 1.00$ | High |
| $0.30 \leq g < 0.70$ | Medium |
| $0.00 < g < 0.30$ | Low |
| $g = 0$ | Remain |
| $-1.00 \leq g < 0.00$ | There is a decline |

Pre-test and post-test assessment papers are used in the data gathering tool. The purpose of the pre-test is to determine the student's starting proficiency prior to the experiment, and the post-test will demonstrate the student's proficiency following the use of the experimental interactive android module. Multiple-choice questions for the pre-test and post-test. SPSS is used to evaluate the gathered data, which is then presented as graphs. After the pretest and posttest, statistical data analysis was carried out, namely the normality test and hypothesis test. If the data is normally distributed, a hypothesis test is carried out, namely a parametric test, and if the data is not normally distributed, a non-parametric test is carried out. Normal distributed data if the significant value > 0.05.

## Result and Discussion

*The Analysis Stage*

Implementing the ADDIE development methodology, research and development is being conducted. Using an integrated differentiated learning method, the end outcome is a media product in the form of an interactive Android module. The first step that researchers take is analysis. The purpose of this step is to identify issues and ascertain learning requirements. At this stage of analysis, it was found that students were used to using gadgets in their daily lives. Schools rely on teaching materials obtained from MGMP Science and resulting in a lack of innovation in the implementation of learning. Teachers find it difficult to arousing students' interest in reading, and difficulty obtaining media Interactive learning that is complete with innovative learning to provide to participants education, so that there are limited learning resources that can be used by participants to learn independently.

*The Design Stage*

Design stage to design a product that complies with results of the analysis. Interactive android module accessible via smartphone which can be accessed anytime and anywhere. The first the step in the design phase is to create a module design using Canva to make the content look more engaging. Following the completion of the preliminary analytical phase. We then move on to the design stage, which aims to create the final product by gathering resources that are specific to

the goals, competencies, and indicators. Additionally, we gather supporting materials to create interactive Android modules, which are collections of questions that can enhance student learning outcomes. The design of the interactive Android module development is as follows:



**Figure 3**. Interactive android module cover

*The Development Stage*

At the development stage, an interactive android module is produced according to the pre-made design up to Interactive Android module is finish. Validation is carried out based on aspects content qualifications, language, and presentation and graphics. After validation process, the researcher also experienced a series of revision process for products developed based on improvements and suggestions from expert validators. Interactive android module Validated by validator place. The resulting products are it is then validated by an expert validator that involves testing interactive Android module to evaluate the benefits of the product in learning process. The module is produced according to the pre-established design and is tested (Sileyew, 2019).

Validation is carried out regarding the aspects of legibility, linguistic, presentation and graphic with the aim of assessing the module's feasibility in terms of content, presentation using technology, and success in achieving learning objectives. The results of the electronic module production are then validated by expert validators, in this case, lecturers from Padang State University (UNP) and 1 teacher from SMPN 16 Padang. In order to gauge the degree of conformance with regard to materials and media, the developed media are subsequently verified by specialists. The purpose of this step is to raise the standard of the media in order to accomplish the desired outcomes. The

following table displays the results of material validation

**Table 4.** Validation Result by Validators

| Validators | Aspect | | |
|---|---|---|---|
| | Eligibility | Linguistics | Presentation and graphic |
| 1 | 0.80 | 0.75 | 0.79 |
| 2 | 0.97 | 0.86 | 0.94 |
| 3 | 0.97 | 0.86 | 0.95 |
| 4 | 0.91 | 0.96 | 0.94 |
| Average | 0.91 | 0.85 | 0.90 |
| Validity categories | Highly valid | Highly valid | Highly valid |
| Overall average | 0.89 | | |
| Validity categories | Highly valid | | |

Based on 3 aspects of assessment, namely the egibility, linguistic, presentation and graphics. Average result of interactive android module values by validators, the overall score is 0.89 with a very valid category. For results each aspect can be seen in Figure 3 below:
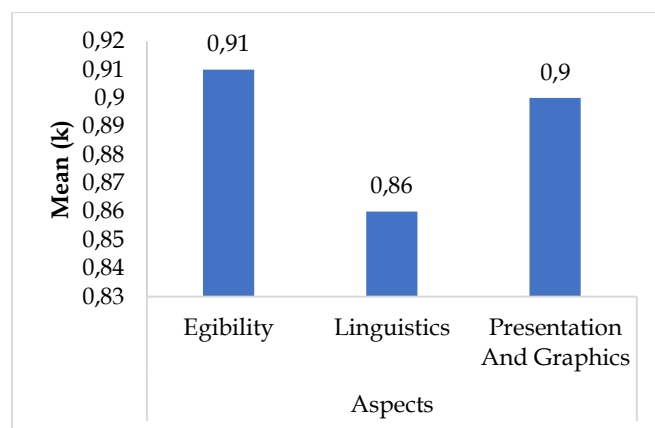


**Figure 4.** The results of the value of each aspect

*The Implementation Stage*

Implementing an interactive Android module for ecology and biodiversity education using an integrated CRT strategy of differentiated learning is the next step in the implementation process using interactive Android modules that have already been created and evaluated by professionals, learning using a culturally responsive teaching strategy is customized to the traits, learning preferences, and thought processes of students. The outcomes of the practical test of the IPA interactive Android module on ecology and biodiversity materials were used to gather implementation data. The interactive Android module's practicality test data came from a practicality questionnaire that was completed by 32 students and four science instructor participants. Figure 4 below displays the findings of validation with four science instructors from SMPN 16 Padang:
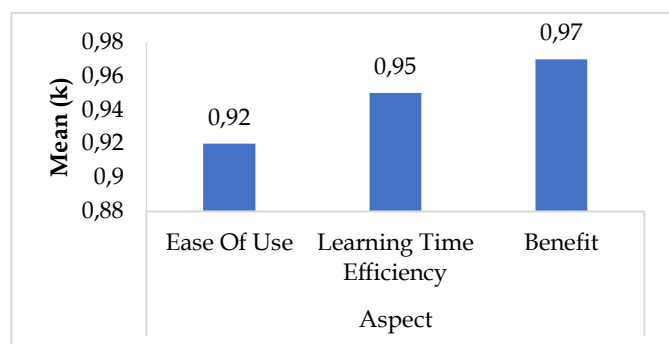
**Figure 5.** Practical results of science teachers

The results of the overall teacher practicality test can be seen in Table 5.

**Table 5.** The Result of the Overall Teacher Practicality

| Assessed Aspects | Mean k | Practicality Categories |
|---|---|---|
| Ease of Use | 0.92 | Very high |
| Learning Time Efficiency | 0.95 | Very high |
| Benefit | 0.97 | Very high |
| Overall Average | 0.95 | Very high |

The results of the test scores were derived from Table 5. The teacher's completed Android module's practicality received a score of 0.95, placing it in the very high category. Features evaluated in the interactive Android modules' practicality test include usability and learning time effectiveness advantages.

Using a one-group pretest-posttest approach, the implementation step was conducted by testing the interactive Android module's impact on student learning outcomes. Thirty-two students participated in the efficacy test. Multiple-choice or objective tests are the method utilized to gather data on learning outcomes. The results of the descriptive analysis aim to find out the overview of the data that has been collected. The results of the description can be found in the table 6.

**Table 6.** Pretest-Posttest Result Data

| Statistic | Pretest | Posttest |
|---|---|---|
| Mean | 30.94 | 78.13 |
| Deviation standard | 11.94 | 14.79 |
| Min | 5 | 35 |
| Max | 50 | 95 |

An analytical preparatory test, the normalcy test, must be performed before to the t-test in order to evaluate the efficacy of the interactive Android module. Table 7 below displays the findings of the normalcy test.

**Table 7.** Normality Test

| Test | Number of Student | Sig. | Conclusion |
|---|---|---|---|
| Pretest | 32 | 0.199 | Normal |
| Posttest | 32 | 0.094 | Normal |

Using SPSS, the normality test results showed a significance value of 0.94 for the posttest and 0.199 for the pretest. A sig value was then obtained by comparing the acquired significance value with the significance threshold of > 0.05, the data is considered to be normally distributed.

By proving the validity of the hypothesis put forward, hypothesis testing allows one to decide whether to accept or reject a statement. The One sample t Test is the hypothesis test that is employed. Table 8 displays the findings of the analysis of the hypothesis test.

**Table 8.** Hypothesis Test

| Test | Number of Student | Sig. | Conclusion |
|---|---|---|---|
| Pretest | 32 | 0.000 | There is a difference |
| Posttest | 32 | | |

Table 8 shows the acquisition of significance values of $0.000 < 0.05$. Based on the data in the table, it is concluded that the hypothesis tests state that the Interactive Android Module through the integrated CRT approach of differentiated learning has an effect on student learning outcomes.

The quantity will be determined by the N-Gain test, whose findings are shown in table 9 below, in order to gauge the degree of efficacy.

**Table 9.** N-Gain Test

| Mean | | Gain Score | N-Gain Test | Category |
|---|---|---|---|---|
| Pretest | Posttest | | | |
| 30.94 | 78.13 | 47.19 | 0.68 | Medium |

Interactive android modules are said to be effective in improving student learning outcomes, and meet the normalized N-gain score of 0.68 in the medium category. Based on the data obtained, the average Post Test score is 78.13 in the good category.

*The Evaluation Stage*

Following the product's testing on the subject, the fifth step is evaluation. Based on the information gathered during the deployment stage, the product will undergo another revision and review at this point. A review of the developed product is part of the evaluation step. Researchers may enhance the items by using the assessment to determine the benefits and drawbacks of the generated products.

*Discussion*

By using an integrated CRT approach to differentiated learning, this research creates a product in the form of an interactive Android module. With a score of 0.89, the final interactive Android module's quality has a very good validity. The interactive Android

module that is produced is also quite useful. Ultimately, this product is also said to have an impact on learning outcomes. Using the ADDIE development methodology, an interactive Android module is created through a number of methodical and procedural steps. The analysis stage is the initial phase of this study. Needs analysis, characteristics analysis, curriculum analysis, and learning resource analysis are some of the tasks that are part of the analysis stage. Design is the second phase. The purpose of the design step is to identify and map the components required for the creation of interactive Android modules. The development stage is where a product that has undergone a lengthy design process is realized. Material and media specialists tested the product to determine its validity, and the results indicated that the interactive Android module met high standards for both material and media validity. By achieving real-world outcomes, instructors who use the program evaluate its usefulness as well.

In this study, the teacher gave a stimulus in the form of interactive e-module media used in science learning. The respondents, who in this case are grade VIII students, gave a positive response as evidenced by the change in learning outcomes to a higher level, or it can be said that there was an increase in learning outcomes. This is also evident from the results of the effect size analysis, which is relatively high. Thus, it can be said that the influence of interactive e-modules on the learning outcomes of grade VIII students is great. The advantage of using E-modules is that they are easily disseminated to students via the internet or digital devices, reducing the need for physical delivery (Dewi & Purwati, 2024; Wahab et al., 2023). This will have an impact on the need for printing materials that can reduce costs and also environmental impacts. In addition, the use of interactive e-modules will help students and teachers to develop important digital skills in an increasingly digital world (Sa'diyah, 2021; Safitri et al., 2023). The findings are in line with previous research that states that the use of interactive e-modules can increase students' understanding and engagement in the learning process, this is because the use of images, audio, and video in e-modules can help illustrate concepts more clearly, making it easier for students to understand (Rofiyadi & Handayani, 2021; Saprudin et al., 2022). With interactive e-modules, it can increase students' motivation and activeness in participating in learning (Kartiko & Mampouw, 2021; Nopiani et al., 2021).

Naturally, teachers must create an activity plan before beginning the learning process, which involves deciding on learning objectives, learning materials, learning instruments and techniques, and learning evaluation planning. A conditional and systematic learning environment can be enhanced by using teacher-prepared learning activities. In addition to being presented in a methodical manner, the content in the E-Module aligns with the learning objectives to be met and makes reference to the learning outcomes derived from the books in the independent curriculum. This is demonstrated by the E-Module's color display, which includes pertinent practice questions, graphics, texts, quiz links, and video elements. Presenting engaging media to students undoubtedly benefits them, particularly in terms of boosting their enthusiasm for studying and acquainting them with the breadth of the subject matter, both of which might influence their comprehension level (Purwaningtyas & Mardati, 2020).

Interactive e-modules significantly influence education and provide The quality and accessibility of education might be greatly enhanced (Rofiyadi & Handayani, 2021; Wahab et al., 2023). E-modules have demonstrated their viability and efficacy in impacting the learning outcomes of students. Students who struggle with learning might benefit from e-modules, which also allow them to learn on their own and assess their own comprehension levels (Laili et al., 2019; Maziyah & Pangestuti, 2021). Multimedia learning is thought to be able to contribute positively to the creation of effective learning. Meaningful learning that influences student learning outcomes is produced by effective learning (Kinasih & Sinaga, 2020; Setyowati & Mawardi, 2018). Therefore, it indirectly affects students' motivation to learn in this study. High learning outcomes are fostered by this strong desire to learn. According to the behaviorist theory of learning, which was developed by Gagne and Berliner, there are two primary factors in learning: stimulus and response. This discussion aligns with this idea. A response is a behavioral shift brought on by the application of a stimuli (Fisabilillah & Sakti, 2021; Subakti et al., 2021).

This study discovered that the interactive Android module was built to be appropriate for usage in the learning process using the integrated CRT technique of differentiated learning. The Culturally Responsive Teaching (CRT) approach offers the benefit of supporting students' varied skill levels; students find it relevant because it connects to their cultural background; and digital learning materials are up to date, which inspires students to study (Amalia et al., 2024). Additionally, CRT learning gives pupils the drive, bravery, and self-assurance to express (Maryono et al., 2021; Taher, 2023). Additionally, culturally sensitive teaching methods draw on students' past knowledge to enhance the effectiveness and significance of learning experiences (Hammond, 2016).

By incorporating CRT into the framework for differentiated learning, which places an emphasis on

adjusting instruction to students' varied interests and skill levels. By addressing cultural diversity, CRT supports this strategy and shows how integrating these tactics may greatly improve student engagement and academic performance in a diverse classroom (Tomlinsom, 2017). It is impossible to separate instructors' application of learning from the implementation of differentiated learning. It's in class. Every child in the classroom has different requirements, and their education should be tailored to their unique circumstances and temperament (Fauzia & Ramadan, 2023). Wood carvers who are knowledgeable about the type, condition, beauty, and technique of their craft are compared to differentiated learning. How educators comprehend students' circumstances and possess knowledge about schooling. Therefore, this differentiated defense needs to be tailored to the needs of pupils, even those with physical and spiritual impairments, without having to discriminate against them. In order to ensure that kids receive education in an appropriate manner (Sopianti, 2023). In classrooms that use differentiated learning, students can study based on their specific aptitudes. However, students must actively participate in their education, either individually or in groups. It is possible to observe students' activities by looking at how they attempt to confidently grasp the material, study independently, learn in their own way, experience assignments from teachers, work in study groups, try out specific concepts on their own, and communicate verbally or through presentations to exchange ideas, insights, and values (Pitaloka & Arsanti, 2022).

In basic education, the utilization of educational media is crucial (Lu et al., 2021; Moghavvemi et al., 2018). One of these is that the media will facilitate the dissemination of information to students, particularly elementary school students. The learning media that are developed should be enhanced through the integration of learning models and learning media, which will facilitate the attainment of the learning objectives that were initially planned at the start of the semester (Anjaswuri et al., 2023). To be able to contribute to raising the standard of education in Indonesia, it is crucial to develop educational capacities.

## Conclusion

The study's findings demonstrate that the interactive Android module created using the integrated Culturally Responsive Teaching (CRT) approach of Differentiated Learning is valid in terms of media and materials, as demonstrated by the extremely high validity criteria obtained from testing by media and material experts. Therefore, it can be concluded that the produced interactive Android app is a legitimate and practical learning tool. Additionally, it has been demonstrated that the interactive Android module improves the learning outcomes of eighth-grade scientific students. This was determined by utilizing the N-Gain test, which 0.68 findings which are medium. According to the research's recommendations, students should be able to use the interactive Android device on their own and invite friends who have never used it to study with them. This will encourage them to build on the ideas they have learned and help them reach their learning objectives.

### Conflicts of Interest
The authors declare no conflict of interest.

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