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Development of a Web-Based Interactive Multimedia Jekekal with Strengthening the Character of Curiosity in Fourth Grade Elementary School Students

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ABSTRACT

The product of this research and development is an interactive multimedia tool that is valid, practical, and effective. This study applied the R&D approach following the ADDIE development model. This research developed interactive multimedia for IPAS (Integrated Natural and Social Sciences) on cultural diversity and local wisdom. The data collected included both quantitative and qualitative information. The study was carried out with fourth grade students at SDN Sentul 2. Data collection methods included interviews, observations, and questionnaires. The final product is an interactive multimedia tool, receiving validation scores of 92.66% from subject matter experts, 90% from media experts, and 96.66% from users (teachers), all categorized as "very valid". In addition, the multimedia tool demonstrated a high level of practicality, with user (teacher) ratings of 96.66%, small-scale trials reaching 100% and large-scale trials reaching 83.32%, all rated as "very practical". The N-gain percentage was 77.27%, indicating the tool's effectiveness in increasing students' curiosity, as it exceeded the 76% threshold. Overall, the product is rated as highly valid, practical and effective based on the evaluations of subject matter experts, media experts and users. This interactive multimedia tool is suitable and effective for use in educational settings.

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1. INTRODUCTION

Education is one of the primary pillars of nation-building, particularly in elementary education, which plays a critical role in shaping students' character and foundational knowledge. In the digital era, information and communication technology (ICT) significantly influences the learning process. Teachers can utilize media and teaching materials to explain subjects to students effectively. Therefore, incorporating interactive multimedia into education offers an alternative solution to improve the effectiveness and attractiveness of learning, particularly for elementary school students.

Fourth-grade students are at an active stage of cognitive development, characterized by a high level of curiosity and a tendency to engage with their environment. The use of interactive multimedia can act as a tool to stimulate this curiosity, making the teaching and learning process more engaging and enjoyable. By learning through appealing educational media, students can deepen their curiosity about new topics through structured and systematically designed steps.

Interactive multimedia offers students opportunities to engage in more creative learning experiences. It not only delivers information through text but also integrates elements such as images, audio, video, and animations that enhance student engagement and interest. The interactive features of a website enable students to interact directly with learning materials, fostering curiosity and improving their understanding. As such, there is a growing need for interactive multimedia designed to captivate students' interest and boost their motivation to learn. In website-based learning, designing content that is not only informative but also engaging is essential. Interactive website features enhance student participation and provide immediate feedback, which is crucial for nurturing their curiosity (Kamila et al., 2023). Additionally, developing websites as educational multimedia allows for regular content updates, ensuring materials remain relevant and up-to-date. This approach supports sustainable and flexible learning, aligning with the evolving needs of today's students.

Strengthening character, particularly curiosity, is crucial in primary education. Curiosity drives students to delve deeper into information, ask questions, and actively engage in the learning process. Research indicates that students with high levels of curiosity tend to achieve better academic performance (Artinta & Fauziah, 2021). By fostering curiosity, students are expected to better understand and continuously explore Indonesia's rich cultural heritage. While Indonesia boasts extraordinary cultural diversity, many students lack awareness and understanding of the local wisdom around them. Primary education serves as a critical foundation for developing students' character and competencies. In Indonesia, the importance of integrating local wisdom into the educational curriculum has gained recognition, particularly within IPAS (Natural and Social Sciences) subjects. IPAS provides opportunities to introduce students to cultural diversity and local wisdom. However, less interactive teaching methods often fail to effectively engage students in learning these topics. By incorporating more engaging and interactive approaches, educators can enhance students' curiosity and appreciation for cultural heritage.

Based on observations conducted in Grade IV of SDN Sentul 2, it was found that the learning process lacked student enthusiasm. Many students had not fully understood the concepts and significance of local wisdom in daily life. During the learning process, teachers frequently assisted students who struggled to grasp the material. At the time of observation, IPAS lessons primarily relied on student handbooks and internet images displayed by the teacher. Students consistently relied on books and teacher explanations

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during lessons, showing a tendency to be passive and inattentive to the material being presented. The frequent use of non-interactive media in lessons limited students' ability to explore new concepts, leading to passive engagement. Although the school has adequate facilities and infrastructure to support digital learning, these resources are underutilized by some teachers due to a lack of digital media integration in their teaching methods.

Referring to the problems mentioned above, students show a lack of enthusiasm and active engagement during the learning process, causing some students to struggle with understanding the IPAS (Integrated Science and Social Studies) material. While most students are eager to learn about local wisdom, some find it challenging to grasp the concepts. Another issue lies in the media used by teachers, which is often not interactive. This limits students' ability to receive feedback on the material, making them hesitant or afraid of making mistakes when asked questions. In the IPAS topic on cultural diversity and local wisdom, Interactive learning media is needed to actively engage students in the learning process and provide them with hands-on experiences to explore these concepts.

Based on a needs analysis of fourth-grade elementary school students, it was discovered that students encountered challenges in learning IPAS, particularly in understanding cultural diversity and local wisdom. Survey results revealed that 71.4% of students found the IPAS material difficult to comprehend due to the lack of engaging teaching media. Students expressed the need for attractive and easy-to-use learning tools. Therefore, the development of interactive multimedia focusing on cultural diversity and local wisdom is necessary. This type of media is expected to increase student interest and engagement, foster interactivity, and enhance their curiosity.

2. METHODS

This study employs the Research and Development (R&D) methodology. The Jekekal interactive multimedia development follows the ADDIE model, which consists of the stages of Analysis, Design, Development, Implementation, and Evaluation. Each stage in the ADDIE model is interconnected, ensuring a systematic approach to product creation. The ADDIE model emphasizes adaptability and alignment with various contexts, making it a widely used and effective framework for product development. This model supports iterative refinement at each stage, facilitating the creation of products that are practical, effective, and tailored to user needs. ADDIE continues to be one of the most efficient methods for product development because of its structured yet flexible nature, allowing it to address diverse educational and technological challenges. **Figure 1** shows the chart of research and development stage.

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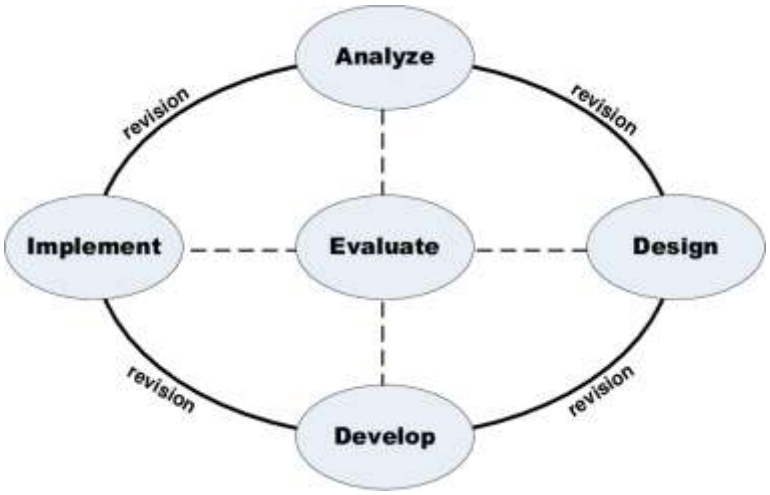


Figure 1. Chart of Research and Development Stage
Source: (Anggraeni et al., 2019)

The needs analysis, curriculum review, and examination of student characteristics were conducted during the analysis phase. This process included observations, interviews, and the distribution of questionnaires to students to identify specific learning needs. During the design phase, two main steps were taken: product design and validation instrument preparation. The product design was created using Microsoft Word 2019 and Canva to develop the initial concept.

Validation instruments in the form of questionnaires were prepared to be assessed by subject matter experts, media experts, and users (teachers). In the development phase, the Jekekal interactive multimedia product was created using a platform called Lumio by Smart. After the product was developed, it underwent validation by experts to assess its level of validity. The validation process utilized questionnaires using a Likert scale ranging from 1 to 5, aiming to provide more detailed evaluation results. The validation scores from the material experts, media experts, and teachers, which have been converted into percentages, can be summarized in the **Table 1** below.

Table 1. Validity Level Criteria

Percentage (%)	Criterion
81—100	Highly Valid
61—80	Valid
41—60	Quite Valid
21—40	Less Valid
0—20	Invalid

Source: (Atika & Mz, 2016)

The next phase is the implementation stage, where the practicality and effectiveness of the interactive multimedia are evaluated by testing its practicality with both teachers and students, as well as assessing its effectiveness with 4th-grade students at SDN Sentul 2. The practicality scores, once converted, are then represented as percentages, which can be interpreted as shown in the following **Table 2**.

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Table 2. Practicality Level Criteria

Percentage (%)	Category	Assessment Decision
81.00–100.00	Very attractive / Very practical	Can be used without revision
61.00–80.00	Attractive / Practical	Can be used with minor revisions
41.00–60.00	Less attractive / Less practical	Requires major revisions; not recommended for use
21.00–40.00	Unattractive / Unclear	Cannot be used
0.00–20.00	Very unattractive / Very unclear	Completely unsuitable for use

Source: (Akbar, 2017)

The effectiveness of the Jekekal interactive multimedia is also assessed through pre-test and post-test results, which are subsequently analyzed using N-Gain analysis. The results are converted into percentages to evaluate the effectiveness of the interactive multimedia product, as presented in the **Table 3** below.

Table 3. Effectiveness Level Criteria

Percentage (%)	Criterion
<40	Ineffective
40—55	Less Effective
56—75	Quite effective
>76	Effective

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. Product Validity

The validation process of interactive multimedia media is collected during the development stage. This stage takes place after the media product has gone through the analysis and design phases. At this stage, validation assessments are conducted by subject matter and media experts. The data collected includes quantitative data from the validation instrument assessments and qualitative data in the form of feedback and recommendations from the experts. A summary of the validation results is presented in the **Table 4** below.

Table 4. Recapitulation of Validation Results

No	Validator	Validation Score	Category
1.	Material Expert	92,66%	Highly Valid
2.	Media Expert	90%	Highly Valid
3.	Teacher	96,66%	Highly Valid
	Correspondence	**93,10%**	Highly Valid

Based on the table, it can be concluded that the Jekekal interactive multimedia website, designed to enhance the curiosity character of fourth-grade elementary school students, has a very high level of validity, with an average validation score of 93.10%.

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3.1.2. Practicality of Interactive Multimedia

After the validation process by experts is completed, the next step is the implementation stage. This stage involves trial activities conducted by teachers on both small and large scales. The purpose of this stage is to collect data on the use of interactive multimedia to determine the practicality of the product. Additionally, the effectiveness of the media in enhancing students' curiosity is also tested. A summary of the practicality test results involving teachers and students related to the developed interactive multimedia is presented in the **Table 5** below.

Table 5. Recapitulation of Practicality Results

No	Validator	Validation Score	Category
1.	Teacher Practicality Test	96,66%	Very Practical
2.	Small-Scale Trials	100%	Very Practical
3.	Large-Scale Trials	83,32%	Very Practical
	Correspondence	**93,32%**	Very Practical

Based on the table, it can be concluded that the results indicate that the Jekekal interactive multimedia website, designed to strengthen the curiosity trait of fourth-grade elementary school students, has a very high level of practicality, with an average practicality score of 93.32%.

3.1.3. Effectiveness of Interactive Multimedia

The effectiveness of this product can be measured through a questionnaire assessing the strengthening of the curiosity character before and after using the learning media. The questionnaire was completed by all 28 fourth-grade students at SDN Sentul 1, as shown in the **Table 6** below.

Table 6. Recapitulation Effectiveness Results

No.	Name	Score		N-Gain	Category
		Pretest	Posttest		
1.	ABP	60	80	0,50	Moderate
2.	AI	30	70	0,57	Moderate
3.	ANK	50	80	0,60	Moderate
4.	AFR	70	100	1,00	High
5.	AMMI	40	70	0,50	Moderate
6.	ANF	60	100	1,00	High
7.	BDP	40	80	0,67	Moderate
8.	ERA	50	70	0,40	Moderate
9.	FSR	60	100	1,00	High
10.	IDPU	60	90	0,75	High
11.	IK	70	100	1,00	High
12.	IR	40	90	0,83	High
13.	MAA	50	90	0,80	High
14.	MFAR	60	80	0,50	Moderate
15.	MFD	20	80	0,75	High
16.	MMMM	50	80	0,60	Moderate

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No.	Name	Score		N-Gain	Category
		Pretest	Posttest		
17.	MMA	60	90	0,75	High
18.	MYB	40	70	0,50	Moderate
19.	NH	60	100	1,00	High
20.	OAK	50	90	0,80	High
21.	RJ	80	100	1,00	High
22.	RRA	50	90	0,80	High
23.	RSK	30	80	0,71	High
24.	RHU	80	100	1,00	High
25.	SRRA	90	100	1,00	High
26.	TP	50	100	1,00	High
27.	VAA	50	80	0,60	Moderate
28.	ZAR	80	100	1,00	High
Total		**1530**	**2460**	**20,63**	
Average		**54,64**	**87,86**	**0,77**	**High**
Qualification		**Effective**			

Based on the table, the results indicate that the questionnaire on strengthening students' curiosity character showed an improvement after using the Jekekal interactive multimedia. The effectiveness level of the interactive multimedia was determined through the N-Gain score, which reached 77.27% in percentage terms. Therefore, the interactive multimedia can be considered effective as it achieved a percentage exceeding 76%.

3.2. Discussion

The development of the Jekekal interactive multimedia website, aimed at strengthening the curiosity trait of fourth-grade elementary school students is was conducted following the ADDIE research model. The first stage in developing this interactive multimedia was the analysis phase. This analysis was conducted through observations and interviews with the fourth-grade teacher at SDN Sentul 2. The findings from these observations and interviews include: (1) Students face difficulties in describing the IPAS (Integrated Natural and Social Sciences) material on cultural diversity and local wisdom. (2) Learning media commonly used include printed materials (such as textbooks) and audiovisual media (e.g., projectors). (3) The media used is less interactive, making it difficult for students to provide feedback on the material. They often feel shy or fear making mistakes when asked questions. (4) Students do not apply the IPAS lessons optimally in their daily lives, resulting in a lack of interest in learning about local wisdom in their surroundings.

In the second stage, which is the design phase, the focus is on product design and the development of validation processes, practicality, and effectiveness instruments. The initial step in the design phase is the creation of the product that is to be developed. The product will align with the learning objectives in the Merdeka Curriculum, which aim for students to understand cultural diversity, local wisdom, history (including key figures and historical periods) in their province, and relate this knowledge to the context of their present lives. However, the product being developed will focus more on cultural diversity and local wisdom. This product will take an interactive multimedia form on the topic of cultural

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diversity and local wisdom, which will be tested with fourth-grade students at SDN Sentul 2. The content for this interactive multimedia will be designed using Microsoft Office Word 2019 and can be seen in **Figure 2**.

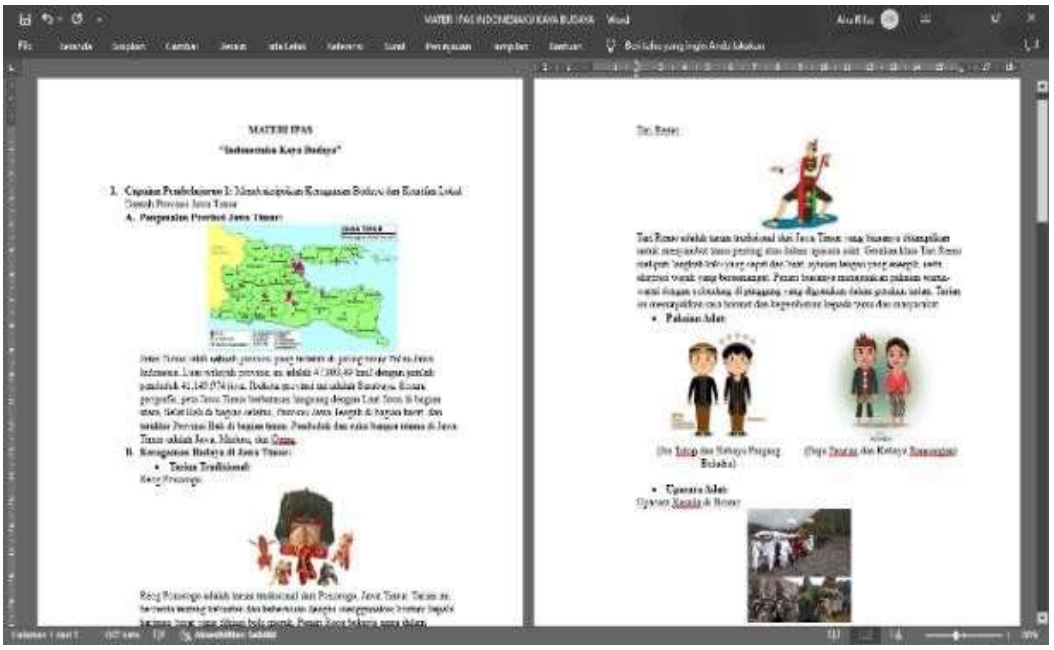


Figure 2. Product Design in Microsoft Office Word 2019

The content design for the developed interactive multimedia is created using the Canva application. This interactive multimedia design is made as engaging as possible to attract students' interest in using the multimedia during the learning process. Once the design is complete, the content will be imported into a website platform called Lumio by Smart. **Figure 3 and 4** below is the design plan for the developed interactive multimedia.



Figure 3. Jekekal Cover Design Design

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Figure 4. Designing Instructions for Using Jekekal

In addition, the product was discussed with the supervisor during the development stage. After the improvement, the product was tested for validation by material experts, media experts and users, namely the teachers of Grade IV of SDN Sentul 2, Jombang Regency. The results of the experts' validation showed that the website-based Jekekal interactive multimedia, which strengthens the curiosity trait of Grade IV elementary school students, can be used with minor revisions, with an average validation score of 93.10%.

The website-based Jekekal interactive multimedia was revised according to the criticism, suggestions and input from Mr MZ as a material expert. Validation by material experts was carried out on 10 July 2024. The aspects evaluated include content suitability, accuracy of core content, presentation of material, language aspects, and curiosity. The outcomes of material validation by subject matter experts on the developed Jekekal interactive multimedia are described as follows.

The Content Feasibility aspect has three assessment indicators, specifically the alignment of the material with the learning phase, learning outcomes and learning objectives. The evaluation outcomes reveal that the material included in the Jekekal web-based interactive multimedia, namely the material on cultural diversity and local wisdom, is in line with the B phase of learning, namely level IV SD. The multimedia contains material and interactive learning features that enhance curiosity and are in line with the learning outcomes and objectives. The results of the evaluation of the aspect of feasibility of the content obtain a percentage of 93.33%, which shows that the content of the website based interactive multimedia is considered to be very appropriate. In accordance with the opinion of Saubari & Sudatha (2023), that the media utilized in the learning process should align with both the material and the students' needs.

The aspect of the accuracy of the content of the material assesses the completeness and appropriateness of the material contained in the web-based Jekekal interactive multimedia. Good media must contain material content that is accurate and appropriate to the level of the students (Hapsari & Fahmi, 2021). The material on cultural diversity and local wisdom is appropriate to the level of the students. The material contained in the Jekekal web-based interactive multimedia is complete and contains accurate material on

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cultural diversity and local wisdom. The material presented is also consistent with the learning objectives contained in the Jekekal web-based interactive multimedia. The assessment results from the aspect of accuracy of the material content get a percentage of 93.33%, so the content of the material in Jekekal web-based interactive multimedia can be said to be very appropriate.

The material presentation aspect assesses the material presentation techniques contained in the Jekekal web-based interactive multimedia. The material presented in the Jekekal web-based interactive multimedia is related to daily life in accordance with one of the learning objectives. The material provided is well-structured and easy to comprehend and is equipped with interactive individual and group quizzes. In line with the perspective of Setiawan & Towaf (2018), that the presentation of material that is simple, interesting, easy to understand and in accordance with the students' conditions is very important to create a sense of pleasure in understanding the material. The results of the evaluation of the presentation aspect of the material obtained a percentage of 86.66%, which indicates that the presentation of the website-based Jekekal interactive multimedia is very appropriate.

The language aspect of the website-based Jekekal interactive multimedia assessment includes three indicators, namely, sentence accuracy, writing accuracy, and sentence clarity. The website-based Jekekal interactive multimedia was accurate and clear in sentence writing. In accordance with the opinion of Santoso et al, (2022), who said that in order for students to more easily understand the media, they must pay attention to the use of language, accuracy of writing, sentence structure, and sentence clarity. The results of the evaluation of the language aspect obtained a percentage of 93.33%, which indicates that the language used in the Jekekal web-based interactive multimedia is highly suitable.

The aspect of strengthening the character of curiosity assesses that web-based Jekekal interactive multimedia can strengthen the character of curiosity of students. The material that invites students to explore the cultural diversity of the surrounding area in web-based Jekekal interactive multimedia encourages students to actively participate in the learning process with the desire to explore and convey more information. Interactive multimedia can promote interaction or emotional relationships between students and teachers and make students more eager to explore new things (Solehudin et al., 2020). The results of the evaluation of the aspects of strengthening the character of curiosity in terms of material evaluation obtained a result of 100%, which indicates that the website-based Jekekal interactive multimedia is very suitable.

In addition, the validation of the Jekekal website based interactive multimedia was also revised according to the criticism, suggestions and input of Mr FIM as a media expert. The validation by media experts took place on 9 July 2024. The evaluation aspects included linguistic aspects, graphical feasibility, platform compatibility and media usability.

The results of the assessment of the language aspect, which includes indicators of sentence accuracy, writing accuracy and sentence clarity, receive a percentage score of 93.33%, so the language used in the web-based Jekekal interactive multimedia is very appropriate. The second aspect is the feasibility of graphics with a score of 93.33%, so it can be said that the presentation of graphics in the multimedia is very suitable. The third aspect of evaluation is the suitability of the platform with indicators of clarity of visualisation, ease of access and ease of use. The results achieved a percentage score of 80% with some input and it can be said that the website based Jekekal interactive multimedia is very suitable for the platform. The fourth aspect is the usability of the media with a percentage score of 93.33%, so the usability of the website-based Jekekal interactive multimedia is very appropriate.

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The entire acquisition of media experts' validation scores obtained an average result of 90%, so that the interactive multimedia Jekekal website-based material of my rich culture it is highly valid and suitable for use in learning. The suggestions and input from the media experts are that the multimedia needs to be equipped with interactive elements such as quizzes, educational games and simulations that encourage students to be more active. The test decision states that the web-based Jekekal interactive multimedia can be used with minor modifications.

In addition, the validation of the web-based Jekekal interactive multimedia was revised according to the criticism, suggestions and input from Mr. TBG as a user or grade IV teacher. The teacher validation was conducted on July 11, 2024. The evaluation aspects include 10 aspects including the feasibility of product content with a percentage score of 100% with indicators of material suitability for the learning phase, learning outcomes, and learning objectives. The website based Jekekal interactive multimedia is suitable when applied in an independent curriculum by strengthening the character of curiosity about the culture and local wisdom around them. This is in line with Saubari & Sudatha (2023), statement that the media used in learning is not only artistic, but must be adapted to meet the students' needs, the material and the curriculum used.

The second aspect, the accuracy of the content of the material, which receives a percentage score of 100%, can be said to be very appropriate. The third aspect is the presentation of the material with a percentage score of 93.33%, so the presentation of the material in the product can be said to be very appropriate. The fourth aspect is the language aspect which gets a percentage score of 93.33%, so it can be said that the language used in the product is very suitable. The fifth aspect is the feasibility of graphics with a score of 93.33% so it can be said that it is very suitable for use.

The next aspect, platform suitability, received a percentage score of 93.33%, so it is very suitable for use. The aspect of curiosity character received a percentage score of 100%, so that the product is highly effective in enhancing the students' curiosity. The aspect of media usability received a percentage score of 93.33%, so it can be said that it is very suitable for use. The aspect of practicality received a percentage score of 100% and the aspect of attractiveness received a score of 100%, so it can be said that it is practical and interesting, very suitable to be applied in learning. The acquisition of user or teacher validation scores obtained an average result of 96.66%, so the interactive multimedia Jekekal web-based material on my rich culture can be said to be very valid and suitable for use.

After validation by experts, the developed and validated Jekekal web-based interactive multimedia product is then measured to evaluate its practicality level. At this stage, three stages were carried out, namely, teacher practicality test, small-scale practicality test, and large-scale practicality test. The results of the practicality trial that were conducted show that the web-based Jekekal interactive multimedia that strengthens the curiosity character of grade IV elementary school students has a very high practicality level with an average practicality score of 93.32%. The results of the practicality test questionnaire are described as follows.

The teacher's practicality test of the website-based Jekekal interactive multimedia product on the material of my Indonesia rich in culture by strengthening the curiosity character of the study was conducted by the fourth-grade teacher at SDN Sentul 2 for elementary school students. The practicality test results assessed by the teacher indicate that the website-based Jekekal interactive multimedia has a practicality level of 96.66%. This result is in the range of 86%-100%, which indicates that this product can be categorized as very practical and can be used without the need for revision (Akbar, 2017).

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Small-scale trials of website-based Jekekal interactive multimedia products on the material of Indonesia's rich culture by strengthening the curiosity character of grade IV elementary school students were conducted in grade IV of SDN Sentul 2. This trial involved 6 students with different abilities. The trial results revealed that the practicality level of the website-based JEKEKAL interactive multimedia reached 100%.

Large-scale trials of website-based Jekekal interactive multimedia products on the material of my rich culture with strengthening the character of curiosity of grade IV elementary school students were conducted in class IV SDN Sentul 2 with 22 students. The trial results demonstrated that the level of practicality of the website-based JEKEKAL interactive multimedia reached 100%. Thus, the website-based Jekekal interactive multimedia product on the material of my rich culture with strengthening the curiosity character of elementary students can be used by students to assist the learning process. This Jekekal interactive multimedia product is practically effective in enhancing students' motivation during learning and enthusiasm because they can explore new things. Thus, the website based Jekekal interactive multimedia product on the material of my rich culture with strengthening the curiosity character of elementary students can be used by students to support the learning experience. This Jekekal interactive multimedia product is practically used in learning to increase students' motivation and enthusiasm because they can explore new things.

Furthermore, the effectiveness of using the website based Jekekal interactive multimedia product on the material of Indonesiaku rich in culture by strengthening the curiosity character of fourth grade elementary students can be measured from the questionnaire assessment of strengthening the curiosity character before and after using this interactive multimedia. The questionnaire was completed by all fourth grade students of SDN Sentul 2, a total of 28 students. The results of the questionnaire strengthening the character of curiosity before using the developed interactive multimedia get a total score of 1530. Then students use interactive multimedia and after that fill a questionnaire after using interactive multimedia that has been developed with a total value of 2460. Based on these results, it shows that the results of the questionnaire on strengthening students' curiosity character have increased after using this Jekekal interactive multimedia. The level of effectiveness of this interactive multimedia can be measured by knowing the results of the increase in strengthening the character of curiosity before and after using interactive multimedia through the N-Gain Score test. Based on the N-Gain Score test that was conducted, the increase in strengthening the character of curiosity of the students obtained a value of 0.77, which is included in the high category according to the statement of (Sundayana, 2015). The level of effectiveness of this interactive multimedia can also be seen through the N-gain score in the form of a percentage, which obtained a value of 77.27%.

Based on the interpretation category of Milala et al. (2021), the developed interactive multimedia can be said to be effective if it obtains a percentage of more than 76%. From this analysis, it can be concluded that the website-based Jekekal interactive multimedia on the material of my Indonesia rich in culture with strengthening the character of curiosity of grade IV elementary school students can be said to be effective in increasing students' curiosity and can be seen in **Figure 5**.

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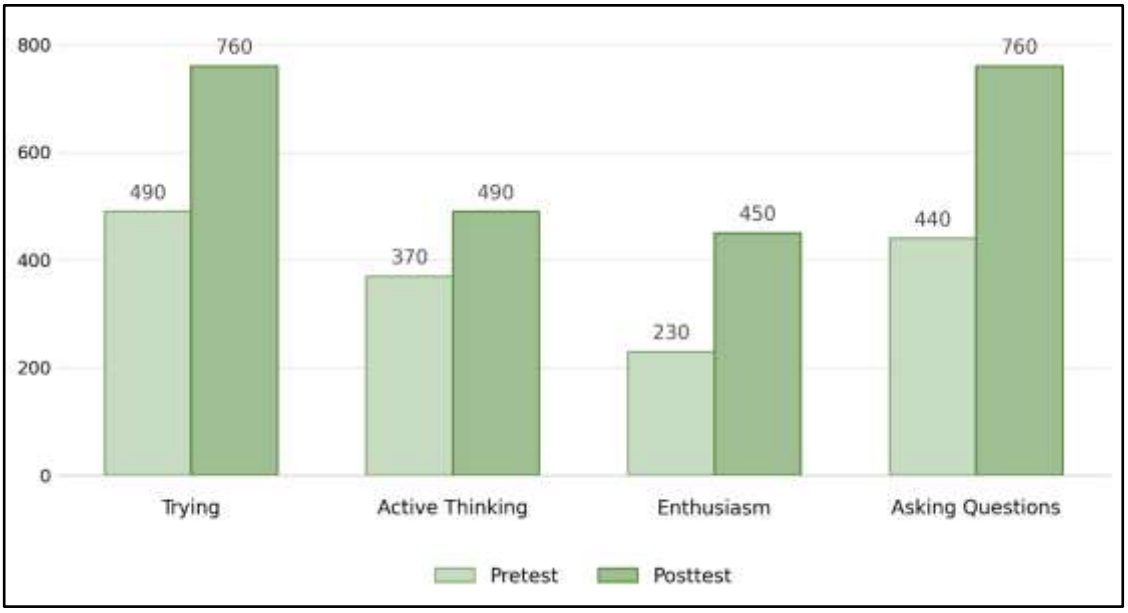


Figure 5. Student Independence Questionnaire Results

The character of curiosity in the observation results has shown that students are able to learn, operate and complete tasks on Jekekal interactive multimedia well. This is supported by the results of the questionnaire on strengthening the character of curiosity in the aspects of trying, active thinking, enthusiasm, and asking questions, which have increased. The indicator that received the highest score in the questionnaire strengthening the character of curiosity after using interactive multimedia products in this study was the indicator of trying and asking with a value of 90.47%. This indicates that students try to get new information from interactive multimedia and actively ask friends and teachers. The indicator of active thinking received a value of 87.5%. This is also indicated by students who feel it is important to seek information and learn about cultural diversity and local wisdom. The enthusiasm indicator received a score of 80.35%. This is also indicated by the students' desire to follow and create projects about cultural diversity and local wisdom in Indonesia.

Other observation results also show that students can follow the learning process with enthusiasm, take the initiative to ask questions, search for answers, pay attention to the observed objects, and demonstrate listening, speaking, reading, and writing skills. Based on the data analysis above, it can be concluded that there is an increase in strengthening students' curiosity character after using Jekekal interactive learning multimedia on the material of cultural diversity and local wisdom of grade IV elementary school students. This may also occur because this interactive multimedia has been theoretically tested through expert validation, whose validity level is very valid with an average validation score of 93.10%. In addition, the developed website-based Jekekal interactive multimedia effectively strengthens the curiosity character of fourth-grade elementary school students meets a very practical level of practicality with an average practicality value of 93.32%.

Strengthening the curiosity character of students encompasses four dimensions: the cognitive dimension, the affective dimension, the behavioral dimension, and the social dimension Nuvitalia et al., (2016). In the first dimension, cognitive dimension, Jekekal interactive multimedia supports active aspects of thinking where students process information, solve problems, and analyze material in depth. This is in line with Khasanah (2019), who states that a learning strategy is needed that gives students the freedom to explore new information. In order to achieve the right strategy for students in the learning process, it is essential to provide a place for students to channel their curiosity (Mifroh,

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2020). This interactive multimedia has been designed and developed as an interactive multimedia that provides new information and students are free to find out more. The second dimension is the affective dimension, which refers to emotional involvement such as enthusiasm, excitement, and satisfaction in learning. Supported by the opinion of Widodo (2018), the affective dimension is closely related to enthusiasm because positive emotions such as excitement and enthusiasm plays a crucial role in boosting intrinsic motivation to learn. The third dimension, the behavioral dimension, is related to students' direct actions, such as trying new things or experimenting. This is supported by the perspective of Fauzi et al. (2017), that the behavioral dimension includes students' courage to try new things and explore their learning environment, which reflects a natural desire to experiment. The last dimension is the social dimension, which involves interaction with the social environment, such as asking the teacher or discussing with peers. The social dimension supports the questioning aspect where students develop curiosity through interactions with teachers or peers (Zunaida, 2022). These four dimensions are optimally developed in Jekekal interactive multimedia, which not only increases students' engagement in learning, but also builds a character that encourages exploration, creativity, and deeper understanding.

From the above explanation, it can be seen that the application of interactive multimedia in learning about cultural diversity and local wisdom is effective in increasing the curiosity of elementary school students, this is supported by the positive results of the product trials conducted. This can be seen from the comparison of pretest and posttest scores, which show a significant increase. Therefore, interactive multimedia serves as an effective tool for effective alternative learning media to enhance students' curiosity character in the learning process.

4. CONCLUSION

Based on the discussion described above, the research and development of interactive multimedia with the ADDIE model has gone through the stages of validity, practicality and effectiveness testing. Jekekal interactive multimedia received an average validity of 92.66% from material experts, 90% from media experts and 96.66% from users (teachers). Jekekal interactive multimedia received an average practicality value of 93.32%. The practical value was obtained from the practical test by teachers of 96.66%, small trials by students of 100% and large trials by students of 83.32%. Jekekal interactive multimedia received an average effectiveness value of 77.27%. This has shown that the web-based Jekekal interactive multimedia has fulfilled the aspects of validity, practicality and effectiveness.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirm that all data and findings presented in this study are the result of the research conducted and have been reported objectively. Furthermore, the authors affirm that this manuscript is an original work, has not been published previously, and is not currently under consideration for publication elsewhere.

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