

Evaluating the Effectiveness of ARCS-Based Interactive Multimedia Incorporating Local Wisdom in Elementary Science Education

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ABSTRAK. Pembelajaran IPAS di Sekolah Dasar masih cenderung berpusat pada guru dan kurang melibatkan siswa secara aktif, serta penggunaan media pembelajaran yang masih terbatas. Kondisi tersebut berdampak pada rendahnya motivasi belajar siswa. Oleh karena itu, dilakukan penelitian pengembangan yang bertujuan mengembangkan multimedia interaktif berbasis model ARCS dengan muatan kearifan lokal pada materi Bunyi dan Sifatnya untuk siswa kelas V Sekolah Dasar. Penelitian ini menggunakan model pengembangan ADDIE dengan metode pengumpulan data melalui kuesioner menggunakan instrumen rating scale. Teknik analisis data yang digunakan adalah deskriptif kualitatif dan kuantitatif. Subjek penelitian adalah multimedia interaktif yang dikembangkan, sedangkan objeknya meliputi validitas, kepraktisan, dan efektivitas multimedia tersebut. Hasil penelitian menunjukkan bahwa multimedia interaktif yang dikembangkan memiliki tingkat validitas sangat tinggi dengan skor 0,964 (media) dan 0,964 (materi). Multimedia ini juga dinilai sangat praktis dengan tingkat kepraktisan guru sebesar 98% dan siswa 97,5%. Uji Paired Sample T-Test menunjukkan nilai signifikan $0,000 < 0,05$, yang berarti multimedia efektif meningkatkan motivasi belajar siswa. Desain menarik, relevansi materi dengan kehidupan sehari-hari, serta muatan kearifan lokal membuat siswa lebih tertarik, percaya diri, dan termotivasi memahami materi Bunyi dan Sifatnya.

ABSTRACT. Science learning in elementary schools still tends to be teacher-centered and less actively involves students, and the use of learning media is still limited. This condition has an impact on low student learning motivation. Therefore, a development research aimed to develop interactive multimedia based on the ARCS model with local wisdom content on the Sound and Its Properties material for fifth-grade elementary school students. This study used the ADDIE development model with a data collection method through a questionnaire using a rating scale instrument. The data analysis techniques used were descriptive, qualitative, and quantitative. The subject of the study was the developed interactive multimedia, while the objects included the multimedia's validity, practicality, and effectiveness. The results showed that the developed interactive multimedia had a very high level of validity with a score of 0.964 (media) and 0.964 (material). This multimedia was also considered very practical, with a practicality level of 98% for teachers and 97.5% for students. The Paired Sample T-Test showed a significant value of $0.000 < 0.05$, meaning that multimedia effectively increases student learning motivation. Attractive design, relevance of material to everyday life, and local wisdom content make students more interested, confident, and motivated to understand the material on Sound and its Properties.

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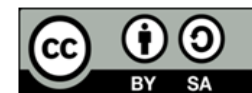
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1. INTRODUCTION

The fundamental goal of implementing the *Merdeka* Curriculum is to provide more relevant, innovative, and creative learning so that students are prepared to face the challenges of the 21st century. Therefore, social studies learning activities in elementary schools are in line with the implementation of the *Merdeka* Curriculum, which must be carried out creatively and innovatively so that students can learn more easily and are more motivated to learn (Thana & Hanipah, 2023; Wahyuni, 2022). Teachers are required to create creative and innovative learning activities for students to learn. Learning media is essential for visualizing learning materials to facilitate student acceptance, especially in social studies, because the material in social studies is still quite abstract for elementary school students to understand

(Kesumaningtyas et al., 2022; Latip & Faisal, 2021). Selecting the right learning media can increase interaction in learning activities, attract learning motivation, and optimize student learning outcomes. Therefore, learning media are needed to visualize material to make it easier for students to understand, especially in social studies, which is very abstract for elementary school students. Creating innovative learning activities for students is not only based on using learning media; teachers must also pay attention to implementing the learning model used. The application of learning models effectively improves the quality of teaching and learning activities (Asriningsih et al., 2021; Khoerunnisa & Aqwal, 2020). Teachers must more frequently apply innovative learning models to students during learning activities. Selecting the right learning model can increase student motivation, thus making them more active during teaching and learning activities (Dharmayani et al., 2022; Ramadhani & Muhroji, 2022). Based on the explanation above, the independent curriculum emphasizes innovative learning in science subjects, maximizing appropriate media and learning models to stimulate student motivation. However, implementing the independent curriculum is not without its challenges faced by elementary school teachers, one is the lack of teacher innovation in the learning process (Rusmiati et al., 2023; Sasmita & Darmansya, 2020). In reality, some teachers in various schools only direct students to textbooks to teach them using lecture techniques exclusive to that teacher. The minimal use of educational media is caused by students' lack of time and patience to absorb creative media (Suci & Mahrudin, 2022; Sukma & Handayani, 2022). This makes classroom learning activities very boring and monotonous for students, leading to a decrease in student learning motivation, which impacts student learning outcomes. Students with high learning motivation tend to have better learning outcomes, while those with low motivation experience difficulties achieving optimal learning outcomes (Suriani et al., 2021; Windayanti et al., 2023).

Based on the results of observations at SDN 2 Kaliakah on August 13, 2024, it was found that the reality in the field did not match the expectations of implementing the independent curriculum. Some of the main problems identified were that the implemented science learning process still tended to be teacher-centered, and teachers used the lecture learning model more often to explain the material to students. This resulted in a lack of student engagement during learning activities, which caused students to feel bored and unfocused while learning quickly. The use and development of media were also still not optimal due to limited time and energy, so learning in the classroom tended to be monotonous because teachers only referred to textbooks and worksheets. The limited material available in student books, especially on Sound material and its less in-depth nature, made students quickly feel bored. The limited learning resources impact less than optimal understanding, ultimately reducing students' learning motivation and impacting student learning outcomes. The learning motivation of fifth-grade students classified as low category at SDN 2 Kaliakah is known based on the results of the questionnaire filled out by all fifth-grade students. Based on the results of the questionnaire, the learning motivation of fifth-grade students at SDN 2 Kaliakah is still classified as low because out of 25 students there is still 1 student whose learning motivation is very low, 8 students who are in the less category, 14 students are in the sufficient category, and there are only 2 students whose learning motivation is included in the good category. In addition, based on direct observation during teaching and learning activities in fifth grade, about seven students are less active in learning and tend not to focus during the activity. The low learning motivation of fifth-grade students at SDN 2 Kaliakah impacts student learning outcomes, namely in the subject of science, specifically on the material of sound and its nature. Many students still get scores below the KKM. The KKM determined by the school is 75; out of 25 students, there are 13 whose scores are still below the KKM.

To address these issues, innovative learning media are needed to present material in an engaging, contextual, and relevant way to students' daily lives, supported by implementing learning models that can continuously increase student learning motivation. Based on various previous research journals, solutions to increase student learning motivation have not yet integrated contextual learning related to daily life. In fact, contextual learning is a crucial factor in creating meaningful learning activities for students because it adapts to students' daily lives (Wero et al., 2021; Yuliana et al., 2021). This aligns with Constructivist theory, which emphasizes that students actively construct knowledge through reflective activities based on experiences and interactions with their environment (Pramana et al., 2024; Yuniarni et al., 2020). Therefore, one solution to increasing student learning motivation is to use interactive multimedia. Interactive multimedia combines several elements of other media, including text, images, graphics, animation, audio, and video, along with interactive delivery methods that can make students' learning experiences more enjoyable and meaningful (Kafrawi et al., 2022; Yuniarni et al., 2020). Interactive multimedia can create a new learning environment, but innovation or renewal in multimedia is needed.

Developing Interactive Multimedia based on the Attention, Relevance, Confidence, Satisfaction (ARCS) learning model integrated with the local wisdom of Balinese Gamelan is highly relevant as an innovative solution. Interactive multimedia allows the integration of various visual, audio, animation, and interactive elements that can bridge the characteristics of elementary school students still at the concrete operational stage. Meanwhile, the ARCS model is designed to foster and maintain student learning motivation through an approach that pays attention to aspects of attention, relevance, confidence, and satisfaction in learning. The integration of local wisdom in the form of Balinese Gamelan is expected to present contextual learning close to the culture and daily lives of students, creating a more meaningful and enjoyable learning experience. In addition to efforts to increase student learning motivation and learning outcomes, this development also contributes to preserving local culture through learning in schools. The selection of Balinese Gamelan is based on the results of observations at SDN 2 Kaliakah, where gamelan percussion is one of the extracurricular activities popular with students. Therefore, by integrating local wisdom as a form of implementing

contextual learning, it is hoped that it can create meaningful learning activities for students because the learning resources come from something they enjoy in their daily lives and as a form of research renewal that will be carried out with previous research (Munawarah et al., 2021; Nabila et al., 2021).

Interactive multimedia in teaching and learning activities positively impacts students as learners and teachers as educators (Kusumawati et al., 2021; Manalu et al., 2022). The presence of interactive multimedia makes the learning process more interesting because it can focus students' attention, thereby significantly increasing learning motivation. Furthermore, teaching materials can be presented more clearly, concretely, and contextually, making it easier for students to understand and relate them to real life, ultimately encouraging the achievement of learning objectives. Teachers also benefit because teaching methods become more varied and less monotonous, thus being able to accommodate various student learning styles. Through interactive multimedia, students are not merely passive listeners but are actively involved in various activities such as observing, experimenting, analyzing, and drawing conclusions. Therefore, the multimedia developed should be easily accessible, practical to use, and inclusive for all groups (Septianingsih et al., 2023; Triana et al., 2021).

Previous studies have shown increased learning motivation after using interactive media (Pujawan, 2019; Septianingsih et al., 2023). The development of interactive multimedia integrated with local wisdom is an interesting innovation. Integrating local cultural elements into multimedia makes learning more contextual and closer to students' lives and helps preserve regional cultural values (Damayanti & Kristiantari, 2022; Kristanti & Sujana, 2022). Other studies have shown that the application of interactive multimedia in learning has improved students' concentration, participation, and deeper understanding of concepts (Dwi agus setiawan & Nur Kumala, 2020; Munawarah et al., 2021). Furthermore, local wisdom elements make students feel proud of their culture and more motivated to learn. Thus, the development of interactive multimedia that combines aspects of technology and local culture is effective in achieving learning objectives and plays a strategic role in instilling character values and maintaining national identity. These findings further confirm that interactive multimedia is an important innovation in education that can answer the challenges of learning in the digital era.

The novelty of this research compared to previous research is the integration or combination of the local wisdom of the Balinese musical instrument "*Gamelan*", IPAS, and the ARCS learning model in an Interactive Multimedia as a learning medium in increasing the learning motivation of fifth-grade elementary school students. Suppose previous research focused more on the effectiveness of multimedia in improving learning outcomes in general. In that case, this research presents a new dimension by linking learning content to local cultural values. This approach provides a more meaningful and authentic learning experience for students. It emphasizes the importance of culture-based education in the context of the Industrial Revolution 4.0 and the era of Society 5.0. In other words, the novelty of this research lies in its contribution in connecting aspects of technology, pedagogy, and local wisdom in an integrated manner to produce a learning model that is relevant to current needs while being oriented towards preserving national identity. This research aims to develop interactive multimedia based on the ARCS model with local wisdom content on the Sound and Its Properties material for fifth-grade elementary school students. Interactive Multimedia Development Research based on the Attention, Relevance, Confidence, Satisfaction (ARCS) Model with local wisdom in Science learning for Grade V Elementary Schools is expected to be the right solution to increase the learning motivation of Grade V Elementary School students.

2. METHOD

This study uses a developmental research model. Developmental research consists of two words: research and development. This type of research is used to develop and test products that will later be developed in the world of education. This study involved 24 students and 2 teachers as respondents. In addition, this study involved 4 experts: 2 media experts and 2 material experts. The model used in this study is the ADDIE developmental research model, a development model consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation. This is because when used in development, this process is considered sequential and interactive (Rohaeni, 2020; Setiawan & et al, 2021). The stages of the ADDIE model can be seen in Figure 1.

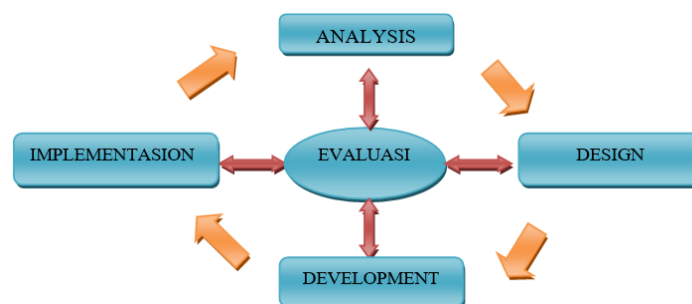


Figure 1. ADDIE Model Stages

The subject of this development research is Interactive Multimedia based on the Attention, Relevance, Confidence, Satisfaction (ARCS) Model with Local Wisdom in Science Learning for Grade V Elementary Schools. At the same time, the object of this development research is the validity, practicality, and effectiveness of Interactive Multimedia based on the Attention, Relevance, Confidence, Satisfaction (ARCS) Model with Local Wisdom in Science Learning for Grade V Elementary Schools. In this study, two data groups were used: qualitative and quantitative. The method used in this study is the questionnaire method. This development research uses a non-test instrument with a rating scale method, in compiling the instrument, referring to the prepared grid table presented in [Table 1](#), [Table 2](#), [Table 3](#), [Table 4](#), and [Table 5](#) (Munawwarah et al., 2024; Wiweka et al., 2021). The instruments used in this study include the validity of media experts, the validity of subject content experts, practicality sheets of teacher and student responses, and student learning motivation questionnaire instruments.

Table 1. Media Expert Validity Test Grid

No	Aspect	Indicator	Instrument Number	Number of Item
1	Text	a. Appropriate text type and size.	1	1
		b. Clarity of text on each topic.	2	1
		c. Appropriate text color with the background.	3	1
2	Images	a. Image clarity.	4	1
		b. Image attractiveness.	5	1
		c. Supporting the material.	6	1
		d. Appropriate image placement.	7	1
3	Animations	a. Animation quality.	8	1
		b. Suitability of the animation used.	9	1
4	Video	a. Clarity of sound in the video.	10	1
		b. Relevance of the video to the material.	11	1
		c. Supporting and facilitating understanding of the material or problem.	12	1
		d. Interestingness of the video used.	13	1
5	Audio	a. Clarity of sound in multimedia.	14	1
		b. Quality of sound effects on buttons.	15	1
6	Layout	a. Harmonious layout of text.	16	1
		b. Appropriate proportions of images to text.	17	1
7	Program Operation	a. Ease of use of interactive multimedia.	18	1
		b. Ease of use of navigation buttons in interactive multimedia.	19	1
		c. Interactive multimedia can be used repeatedly.	20	1
Total				20

Table 2. Subject Content Expert Eligibility Grid

No	Aspect	Indicator	Instrument Number	Number of Item
1	Content Quality	a. Coverage of material is concise, concise, and clear.	1	1
		b. Material is easy to understand.	2	1
		c. Material is aligned with learning objectives.	3	1
		d. Helps increase student motivation.	4	1
		e. Images are aligned with the material.	5	1
		f. Animations are aligned with the material.	6	1
		g. Videos are aligned with the material.	7	1
2	Language Quality	a. Language usage is accurate and adheres to EYD rules.	8	1
		b. Word meaning is clear.	9	1
3	Practice Questions/Exam Quality	a. Evaluation questions are aligned with learning objectives.	10	1
Total				10

Table 3. Grid of Media Practicality Sheet Instruments by Teachers

No	Aspect	Indicator	Instrument Number	Number of Item
1	Appearance	a. The attractiveness of the media display.	1	1
		b. The text is clearly legible.	2	1

No	Aspect	Indicator	Instrument Number	Number of Item
2	Materials	c. The images are clearly visible.	3	1
		d. The narration is clearly audible.	4	1
		e. The combination of colors is used.	5	1
		a. The material is easy to understand.	6	1
		b. The presentation of questions is appropriate to the material on sound and its properties.	7	1
3	Operation	c. Learning activities are well integrated with Balinese local wisdom.	8	1
		a. Interactive multimedia is easy to use.	9	1
		b. Interactive multimedia can be used repeatedly.	10	1
Total			10	

Table 4. Grid of Media Practicality Sheet Instrument by Students

No	Aspect	Indicator	Instrument Number	Number of Item
1	Material	a. Clarity of material in interactive multimedia.	1	1
		b. Appropriateness of language used.	2	1
		c. Ease of use of material presented in interactive multimedia.	3	1
2	Interactive Multimedia Quality	a. Clarity of learning instructions using interactive multimedia.	4	1
		b. Appealing interactive multimedia displays.	5	1
		c. Appealing interactive multimedia colors.	6	1
		d. Appealing interactive multimedia images.	7	1
		e. Ease of use of interactive multimedia.	8	1
3	Usefulness	a. Benefit of interactive multimedia in helping students understand the material.	9	1
		b. Appealing interactive multimedia in increasing student learning motivation.	10	1
Total				10

Table 5. Grid of the Student Learning Motivation Questionnaire Instrument

No	Variable	Indicator	Statement		Number of Item
			Positif	Negatif	
1	Motivation to learn	a. Diligent in facing tasks.	1, 2, 4	3,5	5
		b. Persistent in the face of difficulties.	6, 8, 10	7, 9	5
		c. Demonstrates interest.	11, 13, 15	12, 14	5
		d. Enjoys working independently.	16, 18, 19, 20	17	5
		e. Easily bored with monotonous learning methods.	21, 23, 24	22, 25	5
		f. Able to defend his opinions.	26, 27, 29	28, 30	5
		g. Does not easily let go of beliefs.	31, 34, 35	32, 33	5
		h. Enjoys finding and solving problems.	36, 37, 38, 39	40	5
Total					40

Table 6 presents decision-making and gives meaning to data obtained from expert and practitioner assessments using a four-scale achievement level conversion reference.

Table 6. Conversion of Achievement Levels with a 5-point Scale

Achievement Level (%)	Qualifications	Description
90 – 100 %	Very Good	No revision needed
80 – 89 %	Good	Minor revision
65 – 79 %	Fair	Revised sufficiently
40 – 64 %	Poor	Many things revised
00 – 39 %	Very Poor	Reproduced the product again

3. RESULT AND DISCUSSION

Result

The design of Interactive Multimedia based on the ARCS Model was designed and created by referring to the results of the analysis that had been carried out previously. The design of Interactive Multimedia based on the ARCS Model consists of 3 core parts and is in landscape form with a size of 1920 pixels x 1080 pixels and a total of 66 pages. This media's opening display consists of the material's text and class title, cartoon background, animation, Balinese gamelan background sound, and a "start" sign to start using the Interactive Multimedia operated using a laptop (PC). The initial display of the product displays a student animation that will guide the use of interactive multimedia, with the first display asking about student learning readiness, and then entering into an initial understanding that links previous material with the material to be studied. The core display contains buttons that direct to the curriculum, material, and evaluation menus, the developer profile menu, and usage instructions. In implementing the validity test, four experts will become assessors of Interactive Multimedia based on the ARCS model. A summary of the assessments from the four experts can be seen in [Table 7](#).

Table 7. Summary of Expert Assessments

Expert	Item	Assessor		s ₁	s ₂	Σ_s	n(c-1)	V	Note
		I	II						
Media	1 – 20	97	96	96	95	191	198	0.964	High Validity
Material	1 – 10	48	49	47	48	95	98	0.969	High Validity

The table above shows that the ARCS-based Interactive Multimedia obtained an overall media validity index of 0.964 and an overall material validity index of 0.969. The data falls into the range ≥ 0.8 . According to Aiken's validity criteria, if the validity index shows a figure ≥ 0.8 , it means that the product being developed is included in the high validity category. The practicality test in this development research was reviewed from the perspective of teachers as practitioners in learning and students as users of learning media. Based on the analysis by expert practitioners, the percentage score obtained was for practicality by teachers of 98% and students of 97.5%. Furthermore, the percentage results were converted to decision-making criteria with a conversion table of achievement levels with a scale of five to determine the level of practicality, where the assessment results were in the range of 90-100%, with the qualification of "Very Good", so that no revisions were needed to the product. The media could be declared practical for use.

In the implementation stage, an effectiveness test of Interactive Multimedia based on the ARCS model with local wisdom was carried out on students' learning motivation on the Sound and Its Properties material in grade V of Elementary School. The effectiveness test in this study was carried out through a one-group pretest-posttest field trial using a paired sample t-test analysis technique to determine whether there was an increase in students' learning motivation before and after using Interactive Multimedia based on the ARCS model developed. The results of the pre-test and post-test conducted on students will be analyzed using a t-test to determine the difference in the results of the implementation of Interactive Multimedia ([Dwi Lestari & Putu Parmiti, 2020](#)). The Paired Sample T-Test trial results obtained a significant value (2-tailed) of 0.000. These results indicate that the significance value is smaller than 0.05 (5% significance level) or $p < 0.05$. This means that H_0 is rejected and H_a is accepted. Therefore, Interactive Multimedia based on the Attention, Relevance, Confidence, Satisfaction (ARCS) model with local wisdom in science learning effectively increases students' learning motivation on the material of Sound and its properties.

Discussion

The results of this development research indicate that, first, the validity level of Interactive Multimedia based on the ARCS model with local wisdom obtained an overall media validity index of 0.964 and an overall material validity of 0.969 with a high validity qualification. Second, the level of practicality achieved by teachers was 98% and students were 97.5%, with very good qualifications. Moreover, it shows that Interactive Multimedia based on the Attention, Relevance, Confidence, Satisfaction (ARCS) model with local wisdom in science learning effectively increases student learning motivation on the material of Sound and its properties. To achieve these results, the Development of Interactive Multimedia based on the ARCS model uses the ADDIE development model, which is a development model consisting of five stages, namely Analysis, Design, Development, Implementation, and Evaluation ([Nurhikmah et al., 2023](#); [Setiawan & et al, 2021](#)). Through this stage, a multimedia product is produced that is systematic, structured, and in accordance with learning needs.

First, the developed multimedia consists of three main parts, namely the opening display, the initial display, and the core display, which are packaged in various media elements, ranging from text, images, graphics, animation, audio, and video that attract students' attention and increase learning effectiveness. Second, the developed multimedia is interactive multimedia. Interactivity in multimedia allows for interaction between media and users that can facilitate a deeper learning process. Third, the developed interactive multimedia has its own characteristics compared to other interactive multimedia because it is based on the Attention, Relevance, Confidence, Satisfaction (ARCS) model. Fourth, the developed interactive multimedia based on the ARCS model also integrates contextual learning through the local wisdom of Balinese gamelan musical instruments. Fifth, an interactive multimedia developed based on the ARCS model

with local wisdom is developed to increase student learning motivation by paying attention to indicators of learning motivation. Therefore, based on the results of validity, practicality, and effectiveness, as well as similar research, it is believed that ARCS-based Interactive Multimedia is a learning innovation that can be developed to increase student learning motivation. Theoretically, this study confirms that applying the ARCS model in learning can increase student learning motivation. This model can be used to develop other learning media that are more interesting and relevant to students' daily lives (Putri et al., 2019; Septiawan & Agung, 2020). This study also supports the constructivist learning theory, which emphasizes the importance of direct experience and material relevance in learning. Empirically, the study results show that ARCS-based interactive multimedia effectively increases student learning motivation. This study proves that using learning media that are interesting and relevant to local culture, such as gamelan musical instruments, can increase student engagement in learning. This study also shows that this media is easy to use and well accepted by students and teachers.

Interactive multimedia based on the ARCS model in fifth-grade science learning in elementary school has been shown to increase student learning motivation. With an attractive design and relevant material that links learning to students' daily lives, they are more interested and feel more confident in understanding the material (Kusumawati et al., 2021; Septianingsih et al., 2023). Furthermore, using this media provides a more enjoyable and interactive learning experience, so students feel more motivated to learn. Using interactive multimedia makes the teaching process easier and more engaging for teachers. Teachers can use this media to explain difficult-to-understand material, such as the concept of sound, more visually and enjoyably. The results of this study align with previous research that stated that the application of interactive multimedia in the learning process significantly contributes to increasing student learning motivation (Septianingsih et al., 2023; Wahyugi & Fatmariza, 2021). The development of interactive media combined with elements of local wisdom is a form of innovation that functions not only as a means of delivering material but also as a vehicle for cultural preservation. Local cultural values in learning media can make learning activities more contextual, closer to students' real lives, and foster an appreciation for regional cultural heritage (Damayanti & Kristiantari, 2022; Nata et al., 2021). Furthermore, several other studies confirm that using the ARCS model has proven effective because it can attract students' attention and increase their self-confidence (Aini et al., 2025; Septiawan & Agung, 2020). Based on these findings, ARCS-based interactive multimedia can be viewed as an innovative learning strategy that improves the quality of the learning process and supports the achievement of optimal learning outcomes.

The practicality of this media also allows teachers to use it quickly without requiring much preparation. Thus, teachers can focus more on classroom management and assisting students in learning. For researchers, this research can expand knowledge about the application of technology in education, especially in increasing student engagement and motivation. In addition, the results of this study can be used as a reference for developing other learning media that are more interactive and relevant to students' needs. Meanwhile, the limitations of this research lie in the limited content of the Science learning in this media, which only covers the material of Sound and its properties. In addition, the material included is only for 5th-grade elementary school students. The Development of Interactive Multimedia based on the ARCS model is limited to applying the ARCS model (Attention, Relevance, Confidence, Satisfaction) to the material of Sound and its properties, so it cannot be integrated with other learning materials or models. Recommendations for other researchers are expected to develop further research to test the effectiveness of the ARCS model in various subjects and other levels of education, such as at the junior high or high school level, as well as to examine the long-term impact on student learning achievement. Research can also explore factors that influence the effectiveness of this media, such as school culture, students' backgrounds, and their motivation in learning.

4. CONCLUSION

Developing Interactive Multimedia based on the Attention, Relevance, Confidence, Satisfaction (ARCS) model with local wisdom in science learning represents a learning innovation that contextualizes motivational approaches and local wisdom. This finding enriches the reference for developing learning media that not only focus on visual and interactive aspects, but also pay attention to the relationship of the material to students' cultural experiences. The novelty of this research lies in integrating the concept of local wisdom in the form of Balinese gamelan musical instruments in the context of science learning, especially the material of Sound and Its Properties, which creates a more meaningful learning experience and is closer to students' daily lives. In the future, similar developments are expected to be adapted and developed more widely in other materials and levels of education, while still paying attention to the local cultural context to provide learning that is relevant, meaningful, and able to stimulate students' learning motivation sustainably.

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