Traditional Cake Ethnomathematics-Based Learning Video on Introductory Material of Geometric Shapes for First-Grade Elementary School

Lailatul Fitriah[1*], Ni Luh Sakinah Nuraini[2], Yuniawatika[3] 🆔

[1,2,3] Departmen of Primary School Teacher Education, Universitas Negeri Malang, Malang, Indonesia

ABSTRAK

Pembelajaran matematika merupakan tantangan yang sering dihadapi oleh siswa di berbagai jenjang pendidikan karena pembelajaran matematika cenderung terlalu teoritis, kurang kontekstual, dan variatif sehingga minat siswa dalam mempelajari matematika menurun. Kurangnya konteks dalam pembelajaran matematika yang mengaitkan budaya dan kehidupan sehari-hari siswa sehingga siswa kesulitan memahami materi. Penelitian ini bertujuan untuk menghasilkan video pembelajaran berbasis etnomatematika yang menggunakan kue tradisional sebagai konteks pembelajaran materi pengenalan spasial bagi siswa kelas satu sekolah dasar. Kue tradisional dipilih sebagai konteks yang relevan secara budaya untuk mengenalkan siswa pada konsep dasar bangun geometri. Model pengembangan ADDIE digunakan dengan instrumen pengumpulan data menggunakan observasi dan wawancara dengan guru dan siswa. Subjek penelitian meliputi ahli media, ahli materi, pengguna, dan siswa kelas satu sekolah dasar yang dinyatakan sangat valid dengan hasil skor uji ahli media sebesar 100%, ahli materi 90,9%, dan pengguna 100%. Praktikalitas produk berdasarkan uji coba skala kecil mendapat persentase 100% dan skala besar mendapat persentase 97% untuk siswa kelas satu sekolah dasar. Dari hasil tersebut dapat dinyatakan bahwa video pembelajaran berbasis etnomatematika kue tradisional menarik dan praktis untuk digunakan.

ABSTRACT

Learning mathematics is a challenge that is often faced by students at various levels of education because learning mathematics tends to be too theoretical, less contextual, and varied so students' interest in learning mathematics decreases. Lack of context in learning mathematics that links students' culture and everyday life so students have difficulty understanding the material. This study aims to produce ethnomathematics-based learning videos that use traditional cakes as a learning context for spatial recognition material for first-grade elementary school students. The traditional cake was chosen as a culturally relevant context to introduce students to the basic concepts of geometric shapes. The ADDIE development model was used with data collection instruments using observation and interviews with teachers and students. The research subjects included media experts, material experts, users, and first-grade elementary school students who were declared very valid with the results of the media expert test score of 100%, material experts 90.9%, and users 100%. Product practicality based on small-scale trials gets a percentage of 100% and large-scale gets a percentage of 97% for first-grade elementary school students. From these results, it can be stated that traditional cake ethnomathematics-based learning videos are interesting and practical to use.

1. INTRODUCTION

Mathematics is knowledge gained through systematic, scientific, and critical thinking and reasoning based on logic. Mathematics is taught at every level of school, from elementary to advanced. However, Mathematics is usually deemed tough for students at all levels of school, resulting in numerous issues that must be handled, which contributes to students' low academic accomplishment (Fırat & Laramee, 2018; Lampropoulos et al., 2019). Mathematics is a science that has an abstract nature, so it requires learning media to conceptualize mathematical science. In general, mathematics teachers start a

problem contextually, but the context used in mathematics learning is lacking or does not relate it to everyday life (Kamid et al., 2021; Perdana & Suswandari, 2021). The use of learning videos is a medium that can help teachers convey material in the classroom because they have audio and visual elements. The use of learning videos plays an important role in that students can visualize learning material that cannot be seen or imagined. Mathematics is used and applied in everyday life, so it is important to study mathematics by relating the material to real life and having contextual meaning, one of which is using an ethnomathematics approach (Rohmah & Bukhori, 2020; Yandani & Agustika, 2022).

Ethnomathematics was introduced by D'Ambrosio, a Brazilian mathematician in 1977. Ethnomathematics is a bridge between material in mathematics and culture (Nur et al., 2021; Nursyahidah et al., 2018). Utilizing the culture around students as a source of knowledge to construct students' understanding of mathematical concepts can be done through an ethnomathematics approach (D'Ambrosio, 2016; Machaba & Dhlamini, 2021). The concept of ethnomathematics research was explained by previous study understood as how mathematics is made of many historically rich, diverse, and distinct traditions, namely how mathematical concepts are formed by rich, diverse, and different cultural traditions (Muhtadi et al., 2017).

However, throughout the learning process at school, it was discovered that students were less motivated and quickly bored. Teachers frequently employ the lecture approach, which affects students' poor understanding of the notion of geometric shapes (Fauzi et al., 2023; Pangastuti, 2019). This is one of the reasons why students struggle to understand and picture the content taught in mathematics, particularly geometry, and spatial figures. According to previous research, problems were discovered in the material-related geometric shapes, namely in understanding the concept of geometric shapes, pronouncing the names of many geometric shapes, and distinguishing between cubes and blocks (Su et al., 2022).

Researchers interviewed the homeroom teachers for classes IA and IB at SD Negeri Mergosono 1 in Malang City. The findings revealed that students struggled with geometric shapes material, specifically pronouncing the names of geometric shapes that were frequently mispronounced, such as balls with circles and cubes with squares. They also struggled with distinguishing or classifying objects in the form of blocks and cubes, as well as naming examples of geometric objects that exist around them that were not mentioned by the teacher. Homeroom teachers' use of learning media is also limited and has never been linked to culture, thus when teaching students how to design geometric shapes, they use actual objects in the classroom such as lamps, balls, pencil boxes, and cupboards.

Other media used by teachers is limited to pictures and learning videos found on social media platforms such as YouTube. However, the videos available on the YouTube platform do not meet the teacher's expectations and learning objectives (Dudek & Heiser, 2017; Friskawati & Supriadi, 2020). The video's material presentation is general in nature, does not fit students' learning goals, and only provides explanations that do not employ an approach and are presented in the form of images. This causes pupils to become bored and not completely absorb the material, resulting in less meaningful learning. Elementary school students have a personality that tends to grow bored fast when learning, resulting in a lack of enthusiasm to learn (Amrullah et al., 2021; Siti et al., 2021).

The development of ethnomathematics-based learning media is one way to make the learning process of introductory information on geometric shapes more fascinating and enjoyable. Students require media to help them study in an enjoyable way, one of which is through learning videos (Abdullah, 2017; Widada et al., 2019). The application of learning videos is significant because it allows students to visualize tough topics that cannot be seen or imagined. Daily life and culture are inextricably linked to the structure of geometric shapes, thus students will struggle if the teacher does not tie it to daily life and culture in their area. The development of this learning video media includes animations that refer to the learning material, and the design of the video is tailored to the characteristics of the students, ensuring that the development of this learning video focuses on students' needs and contributes to a meaningful understanding of the material's concepts (Afriliziana, L. A., Maimunah., & Roza, 2021; Imswatama & Lukman, 2018). As a result, an introductory material for first-grade elementary school was created in the form of an ethnomathematics-based learning video about traditional cakes. Traditional cakes were chosen for making ethnomathematics-based learning videos because they are easier for students to recall and more easily found in everyday life. Traditional cakes have had their unique shapes and characteristics since ancient times, and the recipes and methods of producing them have been passed down from generation to generation (Agusdianita et al., 2020; Widada et al., 2019). Learning video media based on traditional cake ethnomathematics can be employed in any setting and any place, making it more efficient and capable of optimizing student learning results (Pebriani, 2017; Sriarunrasmee et al., 2015).

Previous research by previous study revealed that the development of ethnomathematics-based learning videos in elementary schools is effective and practical, making it suitable for use in learning

(Ditasona, 2018; Maryati & Prahmana, 2019). It is expected that the development of this ethnomathematics-based learning video would aid in the expansion of new knowledge, innovation, and inspiration for teachers generating learning media, as well as provide students with a fresh experience in learning using ethnomathematics-based media (Diah Purnami Dewi et al., 2022; Triwahyuningtyas et al., 2020). The goal of this development is to create video learning media based on the ethnomathematics of traditional cakes as introductory material of geometric shapes for first-grade students of elementary school that has been recognized as valid and practicable for use in elementary schools. The novelty is The novelty of this research combines the concept of ethnomathematics with geometry learning, utilizing traditional cakes as learning objects. This not only makes learning more relevant and interesting for students, but also introduces them to local cultural values.

2. METHOD

This research used a type of development research (Research and Development). ADDIE model. The ADDIE model is a systematic, effective, and relevant research design model (Almomen et al., 2016). There are five stages of the ADDIE model, namely Analysis, Design, Development, Implementation, and Evaluation. The following are the stages of the ADDIE model:
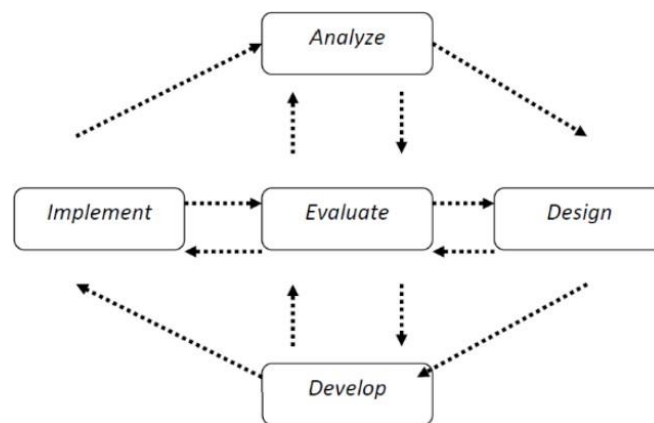

Figure 1. Stages of ADDIE Model Development

In the first stage, analysis, interviews, and observations were conducted with teachers and students to address their needs, the applicable curriculum, school facilities, problems such as relevant material, textbooks, learning media, learning conditions, and student character.

In the second stage, planning or designing was carried out, beginning with determining the learning video concept and components in the form of a storyboard and dubbing design in the learning video using Microsoft Word 2010, creating a video design using the Canva and Kinemaster applications, making a video that has been designed using the Adobe Illustrator CC application 2019 prepared learning implementation plans, validity instruments, and questionnaires aimed at first-grade students to assess the attractiveness and practicality of media. The third stage involved product development by design and product validation, as well as testing with material experts, media experts, and users (teachers) to determine the product's acceptability. In the fourth step, small- and large-scale experiments were conducted to determine the attractiveness and usefulness of the ethnomathematics-based learning video medium. The evaluation stage of the development procedure is completed at each level to ensure that the product produced is consistent with the design.

The subjects of this study are media experts, material experts, and users. The media experts comprised two lecturers from the State University of Malang's Departments of Educational Technology (TEP) and Elementary School Teacher Education (PGSD). The material experts included one Malang State University lecturer from the Department of Mathematics (FMIPA) and one teacher of class IA from SDN Mergosono I in Malang City. Next, the users are IB students from SDN Mergosono I in Malang City. The trial was held in SDN Mergosono I in Malang City, with 6 students of class IA participating on a small scale and 27 students of class IB participating on a larger scale.

This research used both quantitative and qualitative data. Quantitative data was acquired from the proportion of validation questionnaires from media experts, material experts, teachers (users), and student response surveys. Data were gathered using interviews and questionnaires. Qualitative data were gathered through observations, interviews, and ideas for improvement from material experts, media

experts, teachers (users), and student response questionnaires. The validity, feasibility, and attractiveness of ethnomathematics-based learning videos are determined using quantitative data analysis. The validity test was carried out by experts, while the practicality and attractiveness test was carried out by users using a Likert scale questionnaire. Measurement using a Likert scale used the following four criteria as show in Table 2.

Table 2. Likert Scale

Assessment Score	Description
4	Excellent
3	Good
2	Bad
1	Poor

The scores obtained through the questionnaire were then processed using the validity criteria value formula by measuring the percentage of expert validation results or student responses to learning material by dividing the total score achieved by the total expected score, then multiplying by 100%. The results of the validity percentage calculation are categorized in Table 3.

Table 3. Validity Categorization Criteria

Achievement Level (%)	Category	Test Decision
85.01 – 100.00	Strongly Valid	Can be used without revision
70.01 – 85.00	Quite Valid	May be used with minor revision
50.01 – 70.00	Less Valid	May be used with major revision
01.00 – 50.00	Invalid	It may not be used

According to Table 3, an ethnomathematics-based learning video for traditional cakes is considered suitable/valid for use if the proportion of validity test findings is > 70%. If the percentage is ≤ 70%, improvements are required based on the suggestions and input to attain the intended degree of validity. The Guttman scale is used in the practicality questionnaire distributed to students to assess the usefulness of ethnomathematics-based video learning material. The use of the Guttman scale in this research is in the form of a checklist of "Yes" and "No" answers. According to Jainuri (2015), the highest score for the respondent's answer is (1) and the lowest score is (0), if the respondent's answer is "Yes" is worth (1) and "No" is worth (0). The questionnaire findings can be converted into percentages by summing all of the scores collected, dividing by the highest score, and multiplying by 100%. The questionnaire results were analyzed using quantitative data with the percentages determined in Table 4.

Table 4. Attractiveness Categorization Criteria

Validity Criteria	Assessment Criteria
85.01 – 100.00%	Very Attractive
70.01 – 85.00%	Quite Attractive
50.01 – 70.00%	Less Attractive
01.00 – 50.00%	Not Attractive

According to Table 4, traditional cake ethnomathematics-based learning video media can be declared practical and interesting if it achieves a percentage of more than 85%; if it falls below 85%, revisions to the learning video media product are required based on input and suggestions from the student response questionnaire.

3. RESULT AND DISCUSSION

Result

The product of this research is a learning video based on traditional cake ethnomathematics for introductory material on geometric shapes in first-grade elementary school. The findings of this study suggest that using ethnomathematics-based learning films in mathematics education can boost student motivation and lead to more meaningful learning. This product was created utilizing the ADDIE development approach. The resulting product specifications are: (1) the product developed is a learning video based on traditional cake ethnomathematics that mixes audio and visuals, (2) a learning video

product based on traditional cake ethnomathematics consisting of material introducing spatial shapes (blocks, cubes, tubes, cones, and balls), (3) the learning videos based on traditional cake ethnomathematics are separated into two categories: learning videos based on class I elementary school traditional cake ethnomathematics material on flat-sided shapes and learning videos based on class I elementary school traditional cake ethnomathematics material on curved-sided space shapes, and (4) the final form of this learning media is in the form of a video which is disseminated by uploading it on the Lailatul Fitriah Youtube Channel which can be accessed at the following link https://youtu.be/L-HkSiWVvFY (flat-sided shapes) and https://youtu.be/lorpXbSsHIc (curved-sided space shapes). Display of the traditional cake ethnomathematics-based learning video is show in Figure 2.

Figure 2. Display of the Traditional Cake Ethnomathematics-Based Learning Video

Material Expert Validation

The ethnomathematics-based learning video development product for traditional cakes, and building materials, was validated by two material experts, namely (I) Mr. Dr. Rustanto Rahardi, M.Si as a lecturer in Mathematics and Science, and (II) Mrs. Dewanty Putri Pertiwi, S.Pd as Elementary School Teacher. The following are the results of the material expert validation percentage obtained as presented in Table 5.

Table 5. Material Expert Validation Results

No.	Indicator	Assessment Items	A score of Material Expert I	A score of Material Expert II	Average Score	Maximum Score
1.	**Content Feasibility Aspect**					
	Suitability of Material Content	Material aligned with learning outcomes.	4	4	4	4
		The material meets the requirements for the learning objectives.	4	4	4	4
	Material Coverage	The material is appropriate for the skill level of First Grade students.	4	4	4	4
		The material is delivered in full.	4	4	4	4
		Ethnomathematics material relates to everyday life.	3	3	3	4
2.	**Aspects of Material Presentation**					
	Material Presentation Techniques	Spatial building materials are provided systematically.	4	4	4	4
		The material is easy to understand.	4	4	4	4
		The materials presented are clear.	4	4	4	4
3.	**Language Aspects**					
	Accuracy of Language Use	The language utilized is appropriate and relevant to the student's level of development.	3	3	3	4
		The language utilized is communicative and easily understandable.	3	3	3	4
		The language employed does not lead to multiple meanings.	3	3	3	4
Score			**40**	**40**	**40**	**44**
Percentage			**90.9%**	**90.9%**	**90.9%**	**100%**
Validity Criteria					**Strongly Valid**	

Table 5 shows that the traditional cake ethnomathematics-based learning video product had an average validity value of 90.9% with very valid criteria and could be used after revision. Table 6 presents the comments and ideas received from media experts.

Table 6. Feedback and Suggestions from Material Experts

No.	Feedback and Suggestions from Material Experts
1.	The lesson plans and learning process are adjusted to the stages of Bloom's taxonomy.
2.	It is suggested to give several questions/challenges in the learning video.

Base on Table 6 ethnomathematics-based learning video media goods and stated the video content was valid. Experts examine three aspects of the content: suitability, presentation, and language. There are suggestions for improvements to the product, such as aligning the Learning Implementation Plan (RPP) with the stages of Bloom's taxonomy and including multiple questions/challenges in the learning video. The revised lesson plans are tailored to first-grade students who have academic qualities that remain at a concrete operational level, meaning they know and grasp things through shapes, pictures, and symbols but are unable to think abstractly. The use of learning video media is included in Bloom's taxonomy of understanding. The ethnomathematics-based learning video on traditional cakes, which focuses on flat-sided geometric shapes, lasts 6 minutes 15 seconds, whereas the curved side lasts 8 minutes 11 seconds. Adding questions or challenges to the video will affect the duration of the learning video. Meanwhile, effective learning videos are less than 10 minutes.

The feasibility of the content of ethnomathematics-based learning video media received a percentage of 95%. This aspect includes the suitability of the material's content to the scope of learning and learning objectives, the suitability of the scope of the material to the abilities of students in class I, the completeness of the material, and the ethnomathematics of traditional cakes that are relevant to students' daily lives. The aspect of presenting traditional cake ethnomathematics-based learning video media material obtained a percentage of 100%. This aspect contains material presentation techniques, namely the material is presented systematically, the material is easy to understand and the material presented is clear. The language aspect of the traditional cake ethnomathematics-based learning video medium received a percentage of 75%. This aspect includes linguistic accuracy, which means that the language used is appropriate for the student's level of development, communicative, and easy to grasp, and does not lend itself to numerous interpretations.

Media Expert Validation

Media experts verified the development of ethnomathematics-based learning media for traditional cakes, which is material for introducing spatial structures, by assessing three aspects: media presentation, usage, and language. Validation was performed on April 14, 2023, and yielded a percentage result of 100%, with the result being quite valid. The findings of the material expert validation percentage are presented in Table 7.

Table 7. Media Expert Validation Results

No.	Indicator	Assessment Items	A score of Material Expert I	A score of Material Expert II	Average Score	Maximum Score
1.	**Aspects of Media Presentation**					
	Image and animation quality	Images and animations align with the material for introducing spatial structures.	4	4	4	4
		The size of the images and animations in the video is proper and attractive.	4	4	4	4
		The images and animations in the video are clear.	4	4	4	4
	Text clarity or readability	The color of the letters matches the background	4	4	4	4
		Accurate selection of font size	4	4	4	4
		Appropriate placement of words/sentences in the video	4	4	4	4
	Sound quality	Accuracy in selecting	4	4	4	4

No.	Indicator	Assessment Items	A score of Material Expert I	A score of Material Expert II	Average Score	Maximum Score
		backsound/accompaniment instruments				
		Clarity of voice actor's articulation	4	4	4	4
		Integration of voice actors and background sound	4	4	4	4
	The attractiveness of the media	The selection of images and animations is excellent.	4	4	4	4
		The use of audio in videos is excellent.	4	4	4	4
		The color combination in the video is excellent.	4	4	4	4
	Media appropriateness	Images and animations correspond to the characters of grade I elementary students.	4	4	4	4
		Video resolution: 1280 x 720 pixels (aspect ratio: 16:9).	4	4	4	4
		The duration of the learning video is excellent.	4	4	4	4
2.	Usage Aspects					
	Ease of Media Use	Videos are easy to access	4	4	4	4
		Videos can be used anytime and anywhere	4	4	4	4
		Videos can be played on Smartphones, laptops, or computers	4	4	4	4
3.	Language Aspects					
	Accuracy of Language Use	The language utilized is appropriate and relevant to the student's level of development.	4	4	4	4
		The language utilized is communicative and easily understandable.	4	4	4	4
		The language employed does not lead to multiple interpretations.	4	4	4	4
Score			84	84	84	84
Percentage			100%	100%	100%	100%
Validity Criteria			Strongly valid	Strongly Valid		

According to Table 7, the traditional cake ethnomathematics-based learning video product has an average validity value of 100%, with very valid criteria, and can be used following revision. Table 8 presents the feedback and suggestions received from media experts.

Table 8. Feedback and Suggestions from Media Experts

No.	Feedback and Suggestions from Media Experts
1.	The background used in several scenes needs to be replaced.
2.	The explanation of traditional cakes would be better if it were not presented in text.

The test results of ethnomathematics-based learning video products proved that the media was appropriate for usage, valid, and practical. Suggestions for improvement in ethnomathematics-based learning videos include using backgrounds in student stimulus displays of traditional cakes that are overly bright and full, making the text in the video difficult to see, and perhaps disrupting students' concentration. Aspects of presenting traditional cake ethnomathematics-based learning video media include image and animation quality, text clarity or readability, sound quality, and media attractiveness, and media suitability obtained a percentage of 100%. This aspect incorporates harmony into the presentation of learning media and is tailored to the target audience, mainly grade I elementary school

kids. The use of traditional cake ethnomathematics-based learning video media received a score of 100%. This aspect includes the convenience of use of learning videos, such as their accessibility, ability to be utilized anywhere and at any time, and compatibility with smartphones, laptops, and computers. This learning resource in the form of videos can be spread and accessed in a variety of circles through YouTube.

User (Teacher) Validation

The results of the product practicality test by the teacher obtained a validity percentage of 91.34%. The following are the results of filling out the practicality questionnaire by users is show in Table 9.

Table 9. User (Teacher) Practicality Questionnaire Results

No.	Indicator	Assessment Items	User Score (Teacher)	Max Score
1.	**Content Feasibility Aspect**			
	Suitability of Material Content	Material aligned with learning outcomes.	4	4
		The material meets the requirements for the learning objectives.	4	4
	Material Coverage	The material is appropriate for the skill level of First Grade students.	3	4
		The material is delivered in full.	4	4
		Ethnomathematics material relates to everyday life	4	4
2.	**Aspects of Material Presentation**			
	Aspects of Material Presentation	Spatial building materials are provided systematically.	4	4
		The material is easy to understand.	3	4
		The materials presented are clear.	4	4
3.	**Language Aspects**			
	Accuracy of Language Use	The language utilized is appropriate and relevant to the student's level of development.	3	4
		The language utilized is appropriate and relevant to the student's level of development.	3	4
		The language employed does not lead to multiple meanings	3	4
4.	**Aspects of Media Presentation**			
	Image and animation quality	Images and animations follow the material for introducing spatial shapes.	4	4
		The size of the images and animations in the video are appropriate and attractive	4	4
		The images and animations in the video are clear	4	4
	Text clarity or readability	The color of the letters matches the background	4	4
		Selection accuracy of font size	4	4
		Appropriateness related to the placement of words/sentences in the video	3	4
	Sound quality	Accuracy of background/instrument selection accompanist	4	4
		Clarity of voice actor's articulation	3	4
		Integration of voice actors and background sound	4	4
	Attractiveness media	Selection of interesting images and animations	4	4
		The use of audio in the video is interesting	4	4
		The color combination in the video is interesting	4	4
	Media suitability	Images and animations match the characters of grade I elementary school students	4	4
		Video resolution 1280 × 720 pixels (aspect ratio 16: 9)	4	4
		The duration of the learning video is appropriate	4	4
5.	**Usage Aspects**			
	The Ease of Media Use	Videos are easy to access	4	4
		Videos can be used anytime and anywhere	4	4
		Videos can be played on Smartphones, laptops, or computers	4	4
Score			**109**	**116**
Percentage			**93.96%**	**100%**
Validity Criteria			**Strongly Valid**	

Base on Table 9, the product practicality test has six assessment aspects, with the following percentages: 95% for content feasibility, 100% for material presentation, 75% for language, 86.7% for media presentation, and 100% for usage. Users made no suggestions for modifications, and the response to the video media created was good; the language used was appropriate for students at their level of comprehension, and the animation design was quite interesting.

Product Trial
The traditional cake ethnomathematics-based learning video media product was tested twice: once on a small scale and then again on a large scale. This product trial was conducted at SDN Mergosono I Malang City for students in classes IA and IB to determine the product's attractiveness and practicality. The trial test result is show in Table 10.

Table 10. Trial Results

No.	Assessment Aspects	Percentage (%)			
		Small Scale		Large Scale	
		Yes	No	Yes	No
1.	The learning video animation is interesting	100%	0%	100%	0%
2.	The learning video background is interesting	100%	0%	92%	8%
3.	The voice of the learning video is interesting	100%	0%	100%	0%
4.	The learning video music does not interfere with the explanation	100%	0%	96%	4%
5.	Learning through Learning Videos becomes more fun	100%	0%	100%	0%
6.	Learning Videos attract attention to learning	100%	0%	96%	4%
7.	Learning videos motivates learning about culture related to the subject	100%	0%	96%	4%
8.	Learning videos facilitate comprehension of the subject material.	100%	0%	100%	0%

Base on Table 10, the results of large-scale trials through questionnaires on the practicality and attractiveness of the product got a percentage of 100% and small scale got a percentage of 97%. Thus, according to Akbar (2016), the ethnomathematics-based learning video media for traditional cakes is in the practical and interesting category and can be used after revision. The findings of small-scale and large-scale trials differ because there were issues with the sound system during large-scale trials, resulting in less optimal utilization of learning media.

Discussion
Video learning media developed through an ethnomathematics approach makes the learning atmosphere contextually meaningful. Implementing culture-based learning in schools can improve students' learning abilities in all cognitive, emotional, and psychomotor domains (Blumberg & Fisch, 2013; Hayati et al., 2020). Ethnomathematics-based learning videos can help students grasp the subject matter better because the examples offered are closely related to their surroundings and can strengthen students' cultural character (Imswatama & Lukman, 2018; Umbara et al., 2021).

This ethnomathematics-based learning video can enhance students' learning motivation in mathematics since it has animations, images, and sounds that aid students' comprehension of the material. Videos can provide a more concrete explanation of abstract subjects by integrating text, audio, images, animation, and video (Diah Purnami Dewi et al., 2022; Yandani & Agustika, 2022). This video was developed while adjusted to the characteristics of first-grade students, beginning with animation and cultural knowledge closest to students, specifically traditional cakes, and even in terms of color. Choosing colorful materials will capture students' attention and enhance their motivation to learn (Werdiningsih et al., 2019; Yulando et al., 2019). Furthermore, the media's fit to the subject and student characteristics facilitates students' absorption of the offered information. When using learning media, we should not only focus on the purpose and content of learning media, but also on other factors that influence media use, such as student characteristics, learning strategies, time use, facilities and infrastructure, and others (Rong et al., 2022; Werdiningsih et al., 2019).

This development is reinforced by previous research which states that ethnomathematics-based learning videos can optimize students' understanding of mathematical concepts and student learning outcomes berbasis (Widada et al., 2019). Other research explains that through the application of ethnomathematics, students can explore cultural information around them, and then relate it to mathematical concepts (Rosa & Orey, 2015). The main advantage of traditional cake ethnomathematics-

based learning video media is that it includes images and animations to support the content and makes it easier for students to understand while also grabbing their attention. It does this by combining basic information about geometric shapes with traditional Indonesian cakes. Ethnomathematics-based learning video media for traditional cakes are designed and presented by the characteristics of grade I elementary school students, namely by using color compositions that can attract students' attention, animated cartoons that can move, displays of the process of printing traditional cakes, pictures of traditional cakes, and animations that clarify the material's content (Brandt & Chernoff, 2014; Darmayanti et al., 2022; Imswatama & Lukman, 2018). Learning videos are simple to use and may be accessed from any device, including a smartphone, laptop, or PC.

The drawback of traditional cake ethnomathematics-based learning video media is that it can only be accessible by smartphone, laptop, or computer. When learning offline, a laptop, LCD, projector, and sound system will be needed to get the most out of the media. The material covered in the ethnomathematics-based learning video for traditional cakes is limited to the introduction of geometric shapes, including material on the names of geometric shapes, the shape and number of sides of geometric shapes, and the scope of examples only for traditional cakes in Indonesia.

The development of ethnomathematics-based learning videos is confined to products that are valid in the eyes of media experts, material experts, users (teachers), and practical in application. Aside from that, this product simply contains introductory information about spatial structures, such as the name and number of sides. As a result, it is advised that additional studies be conducted to test the product's performance and add comprehensive information about spatial structures. This ethnomathematics-based learning video package focuses on mathematics subjects while also providing a cultural context through examples of traditional cakes. Therefore, it should be redeveloped in other subjects while remaining relevant to Indonesian culture and the environment. A laptop or computer, LCD, projector, and sound system are required for effective media use when learning. Before beginning the lessons, it is recommended to check the tools needed so that the lesson runs optimally.

4. CONCLUSION

Research and development of ethnomathematics-based learning videos on traditional cakes for introductory materials on geometric shapes in first-grade elementary schools using the ADDIE development model through five stages have resulted in the development of feasible and practical media products for learning. It is expected that the traditional cake ethnomathematics-based learning video for the introduction to geometric shapes will assist students in understanding the introductory material on geometric shapes, as well as provide examples of objects and relate them to the culture that students encounter in everyday life. Aside from that, teachers could be encouraged to create learning media using an ethnomathematics approach.

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