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GeoFun App: The Interactive Android-Based Learning Media in Curved Surface Geometry Learning

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Abstract: This study aims to develop Android-based learning media on the topic of curved surface geometry, named GeoFun App. The research method was a development research using the ADDIE model design. Participants in this study were ninth-grade students and mathematics teachers at one of the Islamic Junior High Schools (Madrasah Tsanawiyah) in East Lombok Regency, Indonesia, as well as two experts. The instruments used were media and material validation sheets, teacher and student response questionnaires, and learning outcome tests. Application validity analysis was conducted using Aiken's V scale and the Likert scale. Absolute evaluation was used to test practicality, while the N-Gain method was applied to assess effectiveness. The research findings showed that the GeoFun App media met the validity criteria, with a validity score of 0.869 (material experts) and 0.844 (media experts), categorized as very valid. It achieved a practicality score of 60% from teachers (practical category) and 94.48% from students (very practical category). The result demonstrated an N-Gain of 76.3% and was categorized as effective. The GeoFun App possessed several unique superior characteristics, such as engaging assessments (quizzes, tests, and games), facilitating online and face-to-face learning, and integrating religious aspects (the use of Shalawat Nahdlatin and prayers on the initial display, as well as learning etiquette). Therefore, this study concluded that the GeoFun App met the criteria of validity, practicality, and effectiveness, as it was tailored to student needs and learning difficulties and was Android-based, making it familiar to students. The GeoFun App thus provides an alternative that teachers can use to optimize students' mathematical competence in learning curved surface geometry. This study recommends that future research continue to enhance the application's compatibility so that it can be used on lower Android versions.

Keywords: ADDIE model, curved surface geometry, GeoFun App.

▪ INTRODUCTION

Curved surface solids are one of the important concepts in geometry (Auras & Juurlink, 2021; Feng et al., 2024; Pirôpo et al., 2020; Zhang et al., 2024) because many objects around us take the form of curved solids (Yue et al., 2020). For example, mosque domes are made in an arch shape to distribute forces evenly so that the dome can withstand large loads with minimal material (Gandolfi et al., 2024). Tubes and cylinders serve as pipes or tanks because they withstand internal pressure and are easy to manufacture (Magliano et al., 2024). In aerodynamics, curved shapes form the bodies of airplanes and cars to reduce fluid resistance and increase movement efficiency (Fang et al., 2023; Wang et al., 2020)Click or tap here to enter text..

Despite these benefits, the teaching of curved surface solids often presents challenges (Rodríguez-Nieto et al., 2021; Sudirman et al., 2022). Curved surface solids remain difficult for students to grasp (Gómez-Amador et al., 2019), as complex shapes and intricate calculations characterize the concept (Matsumoto et al., 2019). Various

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factors contribute to students' low learning outcomes, one of which is the use of conventional teaching materials that fail to engage learners (Cesaria & Herman, 2019; Ngware et al., 2015; Yaniawati et al., 2023). The teaching media employed by many teachers tend to be traditional and unappealing to students (Rohendi et al., 2025; Sun, 2021).

Several researchers have studied teaching materials in pembelajaran geometri, but few have developed Android-based learning media. The analysis of findings from several previous studies (Crompton et al., 2018; Eid & Abdulla, 2021; Mandala et al., 2025) has revealed several shortcomings in geometry learning, including students' lack of relational understanding of geometric concepts, limitations of AR technology in enhancing students' understanding of geometry, the complexity of software interfaces that are not user-friendly, and a lack of focus on curved-surface solids. Therefore, this study presents GeoFun to address these shortcomings. GeoFun substantially combines domain expertise, technological innovation, pedagogical integration, and religious values in learning, as well as being easy to use, which has not been integrated in previous research (Gargrish et al., 2020; Voráčová, 2024). This research contributes uniquely to the field of educational technology in geometry learning.

Based on the previous description, the objective of this research is to develop an Android-based learning medium for curved surface solids. This learning medium is named GeoFun App. GeoFun App is an Android application that optimizes students' learning outcomes through various interactive and engaging activities during the learning process. To achieve these objectives, several research questions are formulated:

RQ1. How does the GeoFun App development process proceed in the learning of curved surface solids?
RQ2. How does the implementation process of the GeoFun App operate in the learning of curved surface solids?
RQ3. How valid, practical, and effective is the GeoFun App in the learning of curved surface solids?

▪ METHOD

Participants

This research was conducted at one of the MTs in the East Lombok Regency area, Indonesia. The population in this study was all class IX students at the school. The sample in this study consisted of 30 students (aged 14–15 years), one ninth-grade mathematics teacher, and two expert validators (media and materials). The sample selection was conducted purposively, considering the level of difficulty students faced in learning curved surface solid geometry and the school's readiness to utilize technology-based media. The indicators of technological readiness used were that students were able to operate smartphones and basic learning applications, students had access to smartphones and adequate internet connections, and students demonstrated a positive attitude and self-confidence when using technology in learning.

Research Design and Procedures

This research used the ADDIE model for research and development. This model was chosen because it provided systematic stages that allowed researchers to design,

develop, and evaluate learning media comprehensively to meet the criteria of validity, practicality, and effectiveness (Ferdianto et al., 2019; Shakeel et al., 2023). The research procedures included analysis, design, development, implementation, and evaluation (Li & Cheong, 2023; Spatioti et al., 2022; West et al., 2017). The research implementation period was 10 months, from February to November 2023. In the analysis stage, the learners' needs and characteristics, difficulties faced in understanding curved surface solid geometry material, and the potential use of Android-based technology in the learning process were analyzed. The students' needs were identified through a student needs questionnaire, students' access to technology devices, classroom observations, curriculum and subject matter analysis, and literature review on various student needs in geometry learning. Student difficulties were identified through in-depth interviews with mathematics teachers regarding students' mathematical abilities and factors contributing to learning barriers. This phase was conducted from February to March 2023. In the design stage, the media were design by organizing the content structure, storyboard, and application flowchart. The main features of the application-such as the main menu, sub-materials, quizzes, games, and attendance-were also designed during this phase. This feature selection was based on the pedagogical principle that teaching materials needed to encompass both content and assessment (Buchholtz et al., 2018; Patterson et al., 2020). This activity was conducted from April to June 2023.

During the development stage, the GeoFun App media was created using Kodular, a visual programming–based Android application development platform. Kodular was popular because it was user-friendly, offered various ready-to-use templates, and was free to use. Furthermore, it can be run offline, generate APK apps that run on all Android devices, and automatically adjust to fit the smartphone's screen size (Alfian et al., 2024; Francis et al., 2024; Gundavarapu et al., 2024). This process involved building the user interface, integrating learning content (text, images, and questions), and conducting initial functionality tests. This activity was carried out from July to September 2023.

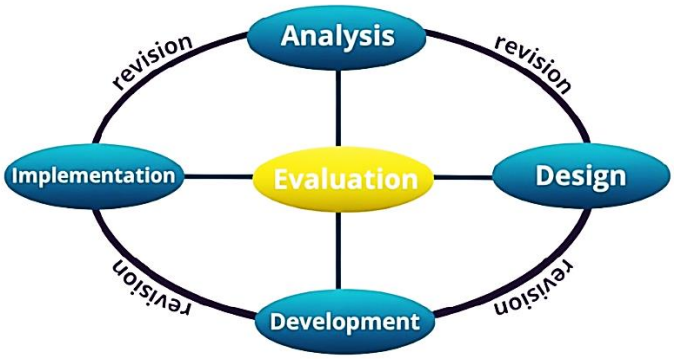

Figure 1. Research procedure

At the implementation stage, the developed application was tested to gather input from teachers and students regarding their use of media in the learning process. In this stage, a one-group pretest-posttest design was conducted over two weeks in October 2023. The teacher acted as a facilitator while students learned using GeoFun. Furthermore, the teacher also provided feedback regarding GeoFun's use during the learning process. Finally, in the evaluation stage, the validity, practicality, and effectiveness of the media were assessed. Validity was determined through evaluations

by subject-matter experts and media experts. Practicality was measured via questionnaires completed by teachers and students. Effectiveness was assessed by analyzing the N-Gain between pretest and posttest scores. In summary, the procedure is illustrated in Figure 1.

Instruments

The instruments used in this study consisted of expert validation sheets, teacher and student response questionnaires, and learning-outcome tests. The instrument was adapted from Koderi et al. (2020). The media expert and material expert validation sheets each consisted of 20 statement items, while the instrument validation sheet consisted of 10 statement items with a Likert scale (five criteria). The media expert validation sheet included two indicators: appearance and programming. The validation sheet for material experts also included two indicators: content and presentation. The student response questionnaire aimed to assess students' interest, ease of use, and learning motivation. The questionnaire consisted of 30 items with a Likert scale (five scale). The teacher response questionnaire aimed to evaluate the ease of teaching, completeness of the material, and media appeal. The questionnaire consisted of 16 items with a Likert scale (five criteria). The student and teacher response questionnaires were adapted from Safitry et al. (2015). The learning-outcome test was used to measure students' understanding of the concept of curved surface solids. The test consisted of 10 descriptive questions. The questionnaire instrument met the validity criteria of being very valid for both student and teacher responses, and was also reliable. The test instrument, on the other hand, met the validity criteria and was deemed valid.

Data Analysis

Data analysis was conducted using various analytical techniques, each tailored to its specific purpose. The Aiken's V was used to assess the validity of the media and materials. The criterion used was that an instrument was declared valid when its Aiken's V value exceeded 0,8 (Mistiani et al., 2022; Pérez-Rivas et al., 2023). The practicality analysis was conducted by determining the percentage of responses from students and teachers; if more than 75% of student responses indicated "yes," then the instrument was considered practical (Citra et al., 2020; Hufri et al., 2019). The N-Gain test was used to evaluate the effectiveness of the GeoFun App media. The criteria were that an N-Gain value greater than or equal to 0,7 indicated high effectiveness, a value less than 0,3 indicated low effectiveness, and values in between were categorized as medium (Levy et al., 2019; X. Li & Yang, 2024; Pertiwi et al., 2024; Rizki et al., 2025).

▪ RESULT AND DISSCUSSION

How Does the GeoFun App Development Process Proceed in the Learning of Curved Surface Solids?

At the analysis stage, it was found that students had difficulty understanding the concepts of curved surface geometry (cylinder, cone, sphere). The learning media that teachers used remained monotonous-textbooks and worksheets lacked visualization and interactivity. Although almost all students owned Android-based smartphones, these devices were not optimized for learning. These findings align with Daryanes et al. (2023), who reveal that teacher-used media often lack effective visuals and fail to facilitate student interaction. Consequently, the learning process feels one-way and unengaging (Le

et al., 2022). In contrast, students' potential can be harnessed through smartphone usage, as Putranta et al. (2021) report that most school students possess smartphones but have yet to leverage them optimally in their learning. Smartphone availability offers a learning opportunity that students favor (Gath et al., 2024).

After analyzing students' needs and difficulties, the application was designed by first creating a storyboard and then developing a navigation flowchart. The main features include interactive materials, quizzes, tests, educational games, an attendance tracker, online features (such as Zoom), and study-buddy support. These features encompass all aspects of learning, including content presentation, learner-material interaction, assessment, and essential Android-based learning functions. These design choices reflect Sujarwo et al. (2022), who demonstrate that Android-based interactive learning should, at a minimum, include material summaries, quizzes, student interaction components, and attendance tracking to facilitate effective learning. An example of the designed storyboard is shown in Figure 2.

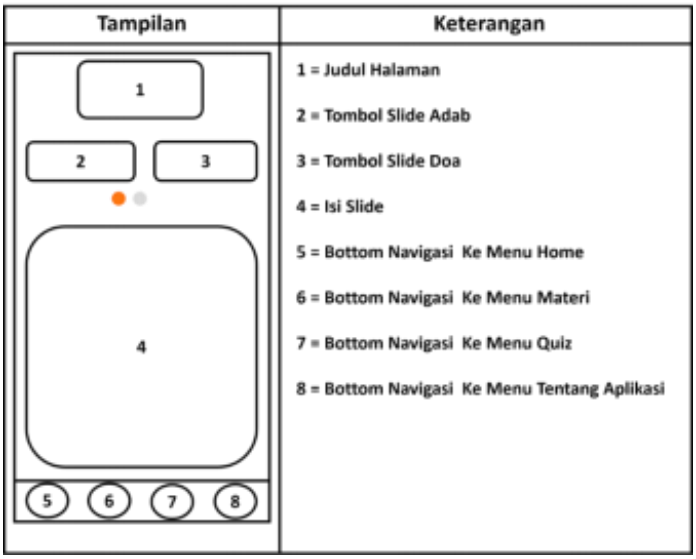

Figure 2. Storyboard

The GeoFun App was developed using Kodular immediately after the design process was completed. The development process included user interface (UI) design, material integration, question creation, and other interactive features. The use of attractive colors and icons familiar to students was intended to enhance learning engagement. This stage served as the core phase because it produced the GeoFun App media itself. The results of this study align with some research that reveals that interface design, material integration, assessment, and other interactive features must already be included during the development stage of Android-based teaching media (Eliza et al., 2024; Muskhir et al., 2023; Syaifudin et al., 2025). This is because the output at this stage is interactive learning media that are ready for implementation (Audu et al., 2023). The GeoFun App can be accessed at GeoFun App.

In the initial menus, additional options related to etiquette and religious aspects of learning appeared. This design ensured that students received blessings from Allah during their study. An excerpt of these menus was shown in Figure 3. The integration of religious

elements is expected to shape students into individuals with a strong religious character (Chan & Wong, 2016; Djannah et al., 2025), in accordance with Indonesia's national education goals. The integration of these religious elements was intended to foster good manners and character in students during the GeoFun App implementation. During implementation, students were asked to recite the *Shalawat Nahdlatin* (a prayer specifically for the *Nahdlatul Wathan* organization) and recite a study prayer before using the app. This was intended to ensure that the learning process received the blessings of Allah SWT. Furthermore, several study etiquettes were integrated. This was intended to ensure that students understood the intentions, rules, and boundaries of their learning during implementation (Mukhlis et al., 2024).

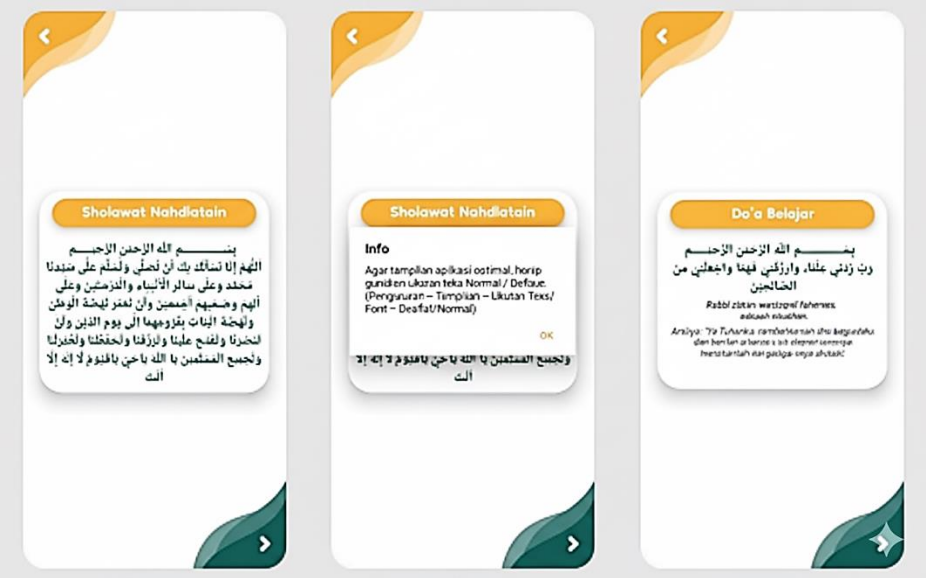

Figure 3. Example prayer menu on the GeoFun App

The initial appearance was also developed attractively to capture students' interest in learning. This strategy is based on Daryanes et al. (2023), who state that learning media should be made attractive. This approach captures students' interest in learning. The selection of colors and visual design should be appealing so that the interface appears elegant (Bland et al., 2024; Mutlu-Bayraktar, 2024). An example of the GeoFun App's dashboard display appears in Figure 4.

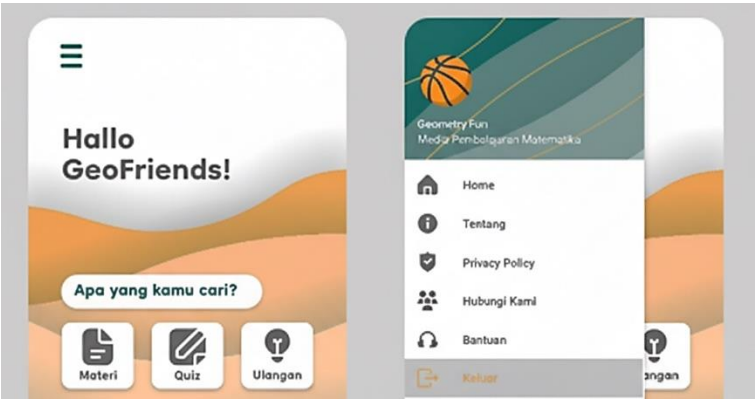

Figure 4. Example dashboard GeoFun App

In addition to its attractive and interactive interface, the GeoFun App integrates cultural elements to help students feel closer to the learning (Johnson et al., 2022). Figure 5 illustrates that the context of the cylindrical shape is the *Gendang Beleq*, a tradition of the Sasak tribe in Indonesia. *Gendang Beleq* is a traditional musical art form of the Sasak people, characterized by a large drum (*beleq*) as its primary instrument. This performance is typically accompanied by bridal processions at weddings in Lombok. This tradition fosters various noble values, such as mutual cooperation (*gotong royong*) and togetherness (teamwork in playing various musical instruments), discipline and responsibility (each player is responsible for their instrument), respect for ancestral traditions, and balance and harmony in life (Novitasari et al., 2023). The integration of Gendang Beleq into the GeoFun App was intended as an effort to maintain national character, teach values of togetherness and respect for tradition, and build cultural resilience in the face of changing times.

Other cultural integrations included the *Honai* traditional house in Papua, which represents a ball, and the Mbaru Niang traditional house in East Nusa Tenggara, which represents a cone. Various world landmarks were also used, such as the *Leaning Tower of Pisa*, Italy; *Ba Na Hill*, Vietnam; *Astana International Financial Center; Bodiam Castle*, England; *Topkapi Palace*, Turkey; and *Universal Studios Singapore* to provide examples of how the concept of curved-sided geometric shapes could be applied to real-life situations. During the GeoFun App implementation, the presence of this cultural element was intended to make students feel more connected to curved-sided geometric shapes, making learning easier (Damayanti et al., 2024). Cimen (2014) reveals that incorporating objects related to tradition or culture into learning makes it more contextual for students' daily lives.

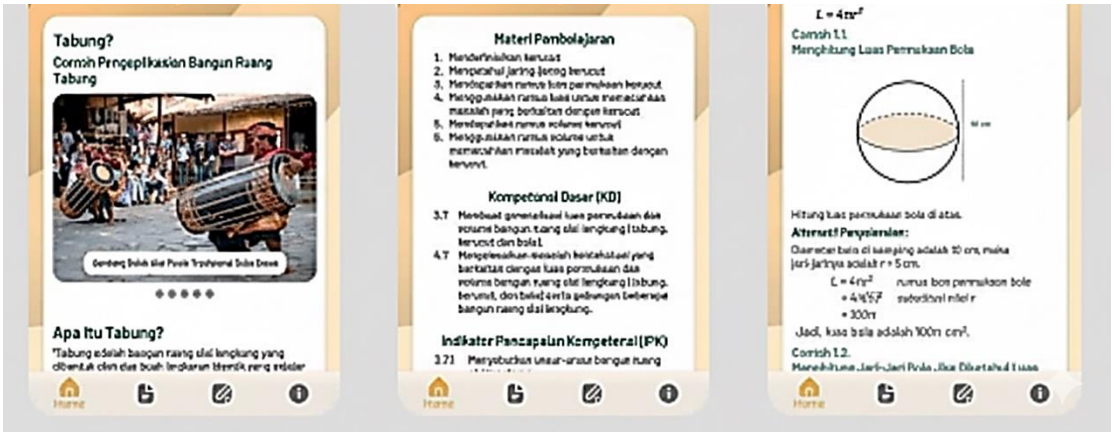

Figure 5. Example of cultural integration in the GeoFun App

The GeoFun App also integrates quizzes as an assessment component in the application. This integration rests on the theory that assessment is an essential aspect that should not be overlooked in learning, including application-assisted learning (Nikou & Economides, 2018). A snippet of the quiz appears in Figure 6. During implementation, the quiz was designed to foster a healthy competitive spirit and student interest in learning. Students were observed to be curious when they failed to answer a question optimally, encouraging them to try again and again, which indirectly improved their mathematical competence (Sridana et al., 2025; Sukarma et al., 2024).

Figure 6. Example quiz on GeoFun App

Besides quizzes, the GeoFun App also integrates games to make students enjoy learning (Nadeem et al., 2023; Yadav & Oyelere, 2021). Students do not feel stressed during learning because the games create a relaxed atmosphere, and they feel more connected to the material, realizing that playing games can be part of the learning process. These findings align with Hui and Mahmud (2023), who reveal that game-based learning attracts students' interest and positively impacts their learning outcomes. A snippet of the

created game appears in Figure 7. Similar to quizzes, this game was designed to be a catalyst for student engagement and interest during the learning process. The varying difficulty levels of the game were also intended to encourage students to strengthen their mathematical skills so that they could complete quizzes during the GeoFun App implementation (Tepho & Srisawasdi, 2023).

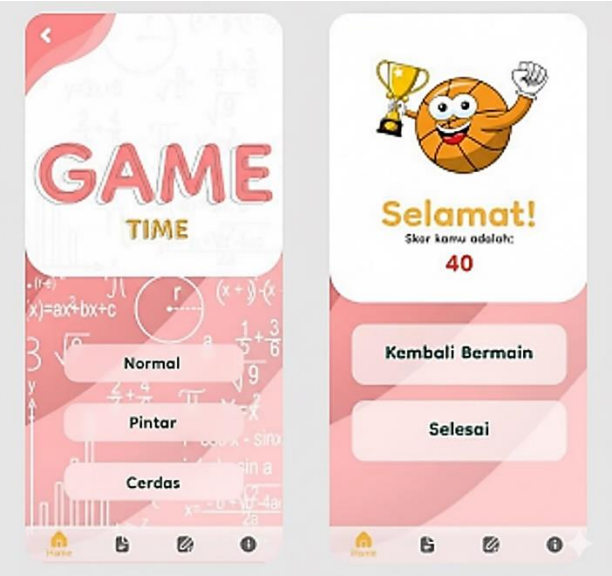

Figure 7. Example game on GeoFun App

How Does the Implementation Process of the GeoFun App Operate in the Learning of Curved Surface Solids?

After ensuring that the GeoFun App media was suitable for use, it was tested to assess its effectiveness in the implementation stage. The implementation activities were conducted in four meetings and one assessment session. In the first meeting, the teacher facilitated students ' understanding of how to download and use the GeoFun App media. The sub-material covered curved surface solids and their uses in everyday life. In the second meeting, the focus shifted to cylinders; in the third meeting, to cones; and in the fourth meeting, to spheres. In the fifth meeting, students received a learning-outcome test consisting of ten essay questions that they completed, along with a questionnaire to gauge their responses to the GeoFun App media.

Overall, the implementation of the GeoFun App media went well: most students were able to operate and follow the lessons using the application, and they appeared enthusiastic and happy during the activities. Students discussed the material with their peers while using the application. When they asked the teacher how to operate the GeoFun App, the teacher directed them to discuss it first with their friends. Snapshots of students' expressions during the learning process were shown in Figure 8. During the first meeting, students still did not understand the learning flow with the GeoFun App media because they were not yet accustomed to it; however, by the third and fourth meetings, they appeared to have mastered the flow.

These findings align with Rodrigues et al. (2022), who state that students usually need time to adapt to learning with new strategies or media, and with Tsay et al. (2020), who note that after several sessions, students become accustomed to these strategies or

media, making the learning activities run more smoothly. The results are also consistent with Sujarwo et al. (2022), who reveal that Android-based learning media attract students' interest because they tend to be more engaging and interactive. Furthermore, the integration of games attracts students' interest, as they usually use smartphones for gaming (Costa et al., 2021; Yadav & Oyelere, 2021).

Figure 8. Documentation of GeoBoard implementation

How Valid, Practical, and Effective is the GeoFun App in the Learning of Curved Surface Solids?

Validation was conducted by two experts: a media expert and a content expert-using a Likert-scale expert validation sheet. The validation results revealed an Aiken's V score of 0,869 from the material expert, indicating that the GeoFun App media was categorized as valid from the material perspective for use in learning curved surface solids. The media expert's validation yielded an Aiken's V score of 0.844, also categorizing the GeoFun App as valid from the learning-media perspective. Subject-matter experts assessed that the content presented in the GeoFun App aligned with the curriculum, that the mathematical concepts were appropriate, and that the material delivery was clear and comprehensive. Meanwhile, media experts evaluated the GeoFun App as having a strong visual appeal, intuitive navigation, and a consistent layout, making it easy to use.

These validation outcomes likely stem from the GeoFun App's development, which is based on students' identified needs and difficulties when learning curved surface solids. This finding aligns with Seechaliao (2024), who reveals that teaching media built around learners' needs and challenges tend to be more systematic, complete, and attractive. Moreover, when media are Android-based, they typically offer greater interactivity and appeal (Bani & Masruddin, 2021; Sujarwo et al., 2022).

Regarding practicality, the percentage of teachers responding to the GeoFun App was 60%. In other words, the GeoFun App was quite practical to use. This was because teachers tended to be younger, making them more comfortable with the GeoFun App. The GeoFun App was also quite easy to use, as teachers were accustomed to using smartphones. This small percentage suggested that the GeoFun App needed improvement. Two points were recommended by teachers. First, the GeoFun App should use operational and practical language for ease of understanding. Second, the net material was not yet included in the app. Furthermore, it took time for teachers to master all the

app's features, and each student needed to have a smartphone with an adequate internet connection for learning. This suggestion aligned with the theory that the use of operational and developmentally appropriate language should be considered when developing technology-based teaching materials (Zhang et al., 2022). Furthermore, the material presented in digital teaching materials should be comprehensive for greater comprehensiveness (Dyrvold & Bergvall, 2023). Teachers also noted that the GeoFun App simplified the delivery of geometry concepts requiring visualization, but suggested adding features such as automatic grade printing and curriculum-assessment integration.

The percentage of teacher responses differed from that of the student responses. The study revealed that 94,45% of students described it as very practical. Students reported that the app was easy to navigate and engaging, and helped them understand the material. It also made learning mathematics more enjoyable than traditional textbooks. These differing results stemmed from the differing perspectives of teachers and students. Students focused solely on usability, while teachers focused more on pedagogical aspects, administration, preparation, and evaluation. Students did not need to worry about the availability of supporting technology, such as smartphones and internet connections, while teachers did. Furthermore, students were likely more adaptable to new technology, while teachers required more time.

These findings align with those of Rohendi et al. (2025), who demonstrate that Android applications enable teachers to deliver mathematics content more effectively by providing strong visualizations that support students' spatial abstraction. They also align with Martín-Sómer et al. (2024), who show that application-based learning feels more enjoyable than textbook learning because the visualizations are more engaging and attractive (Perdana et al., 2023). Additionally, this supports deep-learning principles, which suggest that learning should be enjoyable for students (Kovač et al., 2025).

Finally, the GeoFun App proved effective in optimizing students' mathematics learning outcomes on curved surface solids. The N-Gain test results showed a significant improvement between pretest (mean = 51.37) and posttest (mean = 83.27) scores, yielding an N-Gain of 0.763, which was categorized as effective. These outcomes demonstrated that the GeoFun App was not only visually appealing but also functionally robust in aiding conceptual understanding. In short, the comparison of students' scores from the pre-test to the post-test is shown in Figure 9. This finding aligns with Saragih et al. (2024), who reveal that Android-based learning optimizes students' outcomes in curved-solid topics by facilitating the abstraction process and clarifying real-world shapes. Similarly, Beisenbayeva et al. (2024) show that Android apps help students create illustrations, making it easier to visualize curved surface solids that are otherwise difficult to imagine.

The effectiveness of the GeoFun App stemmed from several unique characteristics of the app itself. First, the integration of various traditional objects and structures made students more familiar with curved-sided geometric shapes during implementation. Students could easily visualize the shape of a cylinder when it was associated with the Gendang Beleq (a traditional drum). Second, students appeared enthusiastic and engaged when completing quizzes and games during implementation. They appeared to truly enjoy the learning process. They also considered learning to be more enjoyable than conventional learning. Third, the integration of religious elements, such as the recitation of the Shalawat Nahdlatain (Shalawat Nahdlatul Wathan) and prayer, made students feel more confident in understanding the material better.

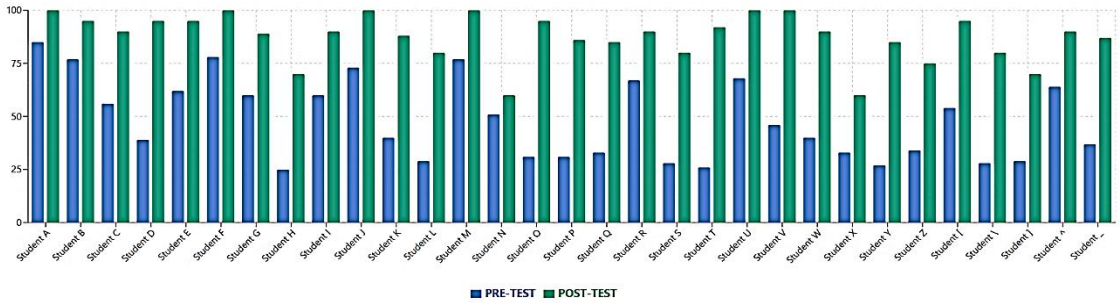

Figure 9. Comparison of students' pre-test and post-test scores

However, these results may be threatened by limitations in the one-group pre-test and post-test design, which could compromise internal validity. The design lacks a control group, meaning that students who did not implement the GeoFun App may also experience improvement in the post-test. Furthermore, many other factors in learning cannot be identified by the design, so the improvement could be due to other factors. Therefore, this study recommends that future research should analyze other factors more deeply that influence the results and implement the GeoFun App using a control group to achieve better internal validity.

Furthermore, the GeoFun App has strong potential to enhance the quality of mathematics education. Its high validity indicates pedagogical and technical appropriateness, and the practicality reported by students and teachers confirms its feasibility in school settings. These results support Rifa'i and Sugiman (2018), who found that Android-based mathematics media can positively shift students' perceptions of mathematics, as students feel more engaged when interacting with familiar Android platforms (Maghfiroh & Soebagyo, 2022; Wulanningtyas et al., 2023). On the other hand, interactive and visual media are essential in mathematics, an inherently abstract discipline. This necessity aligns with the theory that geometry learning requires visual and concrete approaches for effective comprehension and application (Prosser & Bismarck, 2023; Žakelj & Klančar, 2022). Accordingly, the GeoFun App provides images, illustrations, exercises, and educational games that help internalize spatial concepts.

Ultimately, the ADDIE model approach proves effective for media development, offering a clear and systematic framework. This outcome reinforces Mustami et al. (2019), who argue that R&D based models are well-suited for educational innovation because they produce valid, practical, and effective products. However, several limitations remain: the GeoFun App requires Android 5.0 or higher, and features like Zoom Meeting and Study Buddy depend on stable internet connectivity. Given Indonesia's variable internet access, developers should consider offline alternatives or lightweight alternatives for these features.

▪ CONCLUSION

Based on the research results and discussion, several findings are concluded in this study. First, the GeoFun App meets the criteria of validity, practicality, and effectiveness in optimizing students' mathematics learning outcomes on the topic of curved surface solids. This study demonstrated that Aiken's V values obtained were 0.869 from subject-

matter experts and 0.844 from media experts. Approximately 94.48% of students considered the application very practical. Teachers revealed that the GeoFun App was considered practical, with only 60% of the practicality criteria being met. The N-Gain score was 0.763, placing it in the high-effectiveness category. Second, the implementation of the GeoFun App proceeds smoothly because it is developed on the Android platform and is based on the specific needs and difficulties students experience in learning mathematics. Third, the GeoFun App serves as a form of geometry learning that facilitates students' visualization of various curved surface shapes through its attractive and engaging visual features.

This study suggests that the GeoFun App could serve as an alternative solution for teaching curved surface solids, a resource that mathematics teachers can utilize. This study revealed several weaknesses. First, the one-group design, which utilized a low pre-test and post-test, affected the internal validity of the research findings in the trial phase. Second, the teachers' practicality scores were quite low. Third, the GeoFun App is not compatible with smartphones running Android versions below 5.0. Fourth, the Zoom Meeting feature requires a strong and stable internet connection to be accessed properly. Therefore, future researchers are encouraged to retest the GeoFun App, but with the addition of a control group, so that the application's effectiveness can be more accurately measured. Future research is expected to also examine in more depth the factors causing the low teachers' practicality scores for the GeoFun App and alternative solutions to ensure the application can be used offline. The GeoFun App should be developed to support lower Android versions, enabling it to reach a wider user base. The Zoom Meetings feature should be considered, including the option to select alternative, lighter applications, such as Google Meet. This study demonstrated that the GeoFun App is more than just a technological tool; it's a transformative gateway that connects abstract mathematical ideas with real-world student understanding. It opens the door for a generation of students who can visualize, understand, and do well in geometry with confidence and enthusiasm.

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