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Development Of Ispring-Based Gamavak Interactive Media to Improve Student Learning Outcomes in Terms of Learning Styles

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Abstract: This study aims to develop iSpring-based GAMAVAK interactive media to improve student learning outcomes in terms of the learning styles of fifth-grade elementary schools. The background of this study includes the limitations of the use of technology and learning media that can involve students directly, low student learning outcomes due to the application of inappropriate learning styles with student characteristics, low student interest in learning mathematics due to students not being directly involved in learning, the need to increase interactivity in mathematics learning and adjustments to the curriculum. The method used is Research & Development (R&D) with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The validation results from media experts, material experts and learning experts show that the developed media is very valid, with a score of 91%. The media includes competencies and learning objectives, systematic presentation, display quality, instructional quality, technical quality of the media, suitability of material content, suitability of problem solving, content and suitability with the principles of preparing teaching modules so that the media is classified as very feasible. The practicality test obtained a teacher response of 94% and students of 96%, indicating a very practical category. The improvement in learning outcomes was proven by a paired sample t-test with a significance value of 0.000 < 0.05 and t count 7.882 > t table 2.093, so that Ho was rejected and Ha was accepted. Thus, there was a significant difference between student learning outcomes before and after using GAMAVAK interactive media.

Keywords: GAMAVAK Interactive Media; Learning Outcomes; Learning Styles

Introduction

Education is a top priority and plays an important role in increasing knowledge resources in realizing national development, as stated in Law No. 20 of 2003 concerning the National Education System. In today's world of education, technology is a crucial requirement, mastering which is essential for creating various types of learning media. This is because in the 21st century, there is a demand for students to have the skills to use technology. According to Rosyadi & Novrial (2023), when a teacher is skilled in using information and communication technology and applying it to the applicable curriculum in schools, it can have a positive impact on classroom learning and improve student learning outcomes. According to Hariyadi & Haryati (2020), the presence of learning media can improve learning outcomes and student learning motivation in the classroom. Based on the results of observations, mathematics is a subject that is less favored by students, some students even fear it, especially the material on the area of flat shapes.

Low motivation and learning outcomes in mathematics are problems faced by most regions in Indonesia (Hidayati*et al.*,2023). This means that there are still many obstacles and barriers in the mathematics teaching and learning process. This poses a challenge for teachers in improving motivation and mathematics

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learning outcomes according to students' learning styles and current technological developments. According to Rosidah*you al.,* (2022) Students' learning styles, or learning modalities, are important for teachers to understand because each student has strengths and weaknesses, as well as preferences for how information is processed. Understanding students' skills and learning styles will make it easier for teachers to provide an environment and media for optimal information absorption to improve learning outcomes. This is due to Each student has different characteristics (learning styles) in receiving information. If left unchecked, learning motivation will decrease and can result in low learning outcomes. Therefore, it is necessary for teachers to develop learning media that can be adapted to the situation, needs of students and technological developments. After all, the use of learning media must be adapted to students' learning styles to increase motivation and learning outcomes.

Good learning outcomes are usually achieved through a good learning process. Therefore, improving student learning outcomes requires media that aligns with their skills and learning styles. By understanding learning styles, teachers can guide students in learning according to their own learning styles, enabling them to develop their knowledge effectively through learning. This is because media plays a crucial role in the learning process. Humairok & Widyastono (2020) explain that technology-enhanced learning is increasingly being used in Europe because it can simplify the teaching and learning process.*you al.,*(2021) stated that students who participate in interactive multimedia-based learning will achieve higher learning outcomes compared to less interactive or conventional learning. Learning with interactive media also aims to facilitate the learning process and foster teacher creativity and innovation in designing learning processes to maximize student learning outcomes. Therefore, teachers must be skilled in selecting learning media that suit the characteristics of students' learning styles to improve learning outcomes (Nasution, 2021).

ISpring is a software tool that can assist teachers in delivering learning materials. Furthermore, it can convert PowerPoint-compatible presentation files to Flash format. ISpring also provides learning materials in the form of slides tailored to each student's learning style, containing images, animations, videos, and audio, making them more engaging, practical, and ideal. This positively impacts the learning process, maximizing student learning outcomes (Wijayanto et al., 2017; Sasahan et al., 2017; Suprapti 2016).

One such interactive media is the iSpring-based GAMAVAK, which offers the potential to present learning materials in an engaging and interactive way in the classroom, creating a new atmosphere and facilitating unprecedented learning for both students and teachers. Furthermore, its ease of use and accessibility, both at school and outside of school, using a smartphone or laptop, are expected to boost students' enthusiasm for revising lessons at home. The GAMAVAK iSpiring interactive media can facilitate student learning activities. By using this media, students are free to choose their preferred learning style. Furthermore, this interactive media can be accessed using or without a network. Using this media automatically makes it easier for teachers to explain the material being presented.

Based on the above issues, the author feels the need for a learning medium that makes it easier for teachers to improve student learning outcomes, both in terms of learning styles and allowing students to learn anytime and anywhere, using their own learning styles. Using this medium automatically makes it easier for teachers to explain the material being presented. In this regard, the researcher is interested in conducting research and developing interactive media based on GAMAVAK.*iSpring*to improve student learning outcomes in terms of learning styles.

Method

The type of research used is *Research and Development* (R&D) aimed to validate and develop the Ispring-based GAMAVAK interactive media product to improve student learning outcomes from a learning style perspective. The ADDIE model includes five stages, namely: *Analyze, Design, Development, Implementation*, And *Evaluation* (Sugiono, 2017). According to Borg & Gall (2003), "Research and development is a process or method used to validate and develop products." The ADDIE model is suitable for developing learning media because it is easy and efficient. The practicality and suitability of this model also support the process of developing student learning media (Wanti et al. 2024).

The first stage of Analysis, related to the analysis of the work situation and environment, is necessary to identify the products that need to be developed. The design stage involves compiling a flowchart for the use of GAMAVAK interactive media in learning. Flowcharthart is used as a reference for developing the media. will be developed. In addition, the flowchart is also intended to provide an overview of how the GAMAVAK interactive media will be used. The Develop stage consists of two stages. The first stage is the development of learning media which consists of several steps including creating layouts and navigation buttons using Core lDRAW-X7, creating new projects and scenes using Unity 5.6, arranging project display

sizes, uploading assets, namely learning media components, creating pages, adding assets to pages, compiling scripts and creating learning media to applications (APK). The second development stage is testing learning media by installing learning media applications on smartphones. The first implementation stage was validation by experts (media experts, material experts, and learning experts). This was crucial to ensure the product was deemed suitable for use by users. The second stage involved providing the media to teachers to conduct practicality tests. Once the media was deemed practical for use, it was then trialed on a limited basis with fifth-grade students at SDN Sidorejo Lor 03.

This development research was conducted at SDN Sidorejo Lor 03 Salatiga, Sidorejo District, Salatiga Regency, with a limited trial on fifth grade students to determine student responses and learning outcomes reviewed from learning styles. Data collection techniques through observation, interviews, documentation, questionnaires and tests. Questionnaires were used to validate media, materials, learning designs, teacher responses and student responses to the media. Tests were used to determine student learning outcomes using GAMAVAK interactive media using SPSS.

$$AP = \frac{\Sigma x}{SMI} x100\% \quad (1)$$

Information:
AP = Percentage
∑X = Actual Amount
SMI = Almost Ideal
100% = Constant Number

The percentage figures are grouped into five categories to provide meaning and decision making. The five categories are as follows:

Table 1. Product Quality Criteria**.**

Achievement Level	Category	Information
89 %– 100%	Very good	No revision needed
72 %– 88%	Good	Sufficient revision
53 %– 71%	Enough	Quite a Lot of Revisions
36 %– 52%	Not enough	Many revisions
20 %– 35%	Very less	Total revision

Analysis of the practicality test of GAMAVAK interactive media using the SPSS 25.0 program with an independent sample test, ìThis means that the t-test is a test that measures the differences between two or more groups (Mutea *et al.*, 2023). The technique uses the Formula 2.

$$T = \frac{Md}{\sqrt{\frac{\Sigma \quad x^2 d}{N(N-1)}}} \quad (2)$$

Information:
T = Uji-t
Md = Mean of the difference between pre-test and post-test (X2 − X1)
Xd = Deviation of each subject (d-Md)
∑× ^2d= Sum of squares of deviations
N = Subjects in the sample
Db = Determined N-1

To find out whether there is a difference between before and after using the developed media product, the trial results are compared with the t table with a significance of 5% as follows:

Ho: There is no increase in student learning outcomes using GAMAVAK interactive media in terms of learning styles.

Ha: There is an increase in student learning outcomes using GAMAVAK interactive media when viewed from the learning style perspective.

The decision making is as follows:

1) If T-count > T-table then the result is significant, Ho is rejected and Ha is accepted.
2) If T-count < T-table then the result is not significant, Ho is accepted and Ha is rejected.

Result and Discussion

Development research using GAMAVAK (Visual, Auditory Kinesthetic Mathematics Learning Styles) interactive media products was carried out with initial planning through observation and interviews conducted at SDN Sidorejo Lor 03 in the process of learning mathematics in class V. Based on the results of observations, interviews and documentation studies, it was found that the use of media in learning is often carried out in the learning process, but it is difficult to find media that is suitable for the material, student characters and the applicable curriculum at school, namely the independent learning curriculum which emphasises students being free to express their learning style but must remain under teacher control. The lack of use of media makes students bored and difficult to accept the material presented by the teacher, especially in learning mathematics. Based on the results of observations made by researchers, it was found that there was no proper use of learning media in learning mathematics. This impact makes it difficult for students to obtain good learning outcomes. Based on the results of interviews, the use of media, learning styles and time are factors that cause low student learning outcomes. Where teachers must have a lot of time spent with students in the classroom to learn. So that teachers are

overwhelmed in finding the right solution in launching learning in the classroom and outside the classroom. Especially in learning mathematics which requires a lot of time, extra stamina and media that is suitable for students' learning styles. Therefore, it has a huge impact on learning outcomes.

This is in accordance with previous research on the impact of media needs analysis in the learning process of mathematics, especially the area of flat and spatial shapes (Sari & Nurmilawati, 2023) showing that the lack of use of learning media in the learning process makes it difficult for students to understand the material presented. (Hidayat, M. et.al 2025).In the learning process, teachers also need to pay attention to the use of media and student learning styles, even though the time provided is limited, because media and learning styles are a way that each individual can do in receiving lessons and information from their environment in improving learning outcomes. This obstacle is experienced in the development and application of learning media, student learning styles in receiving learning. Therefore, teachers have difficulty in finding the right learning media according to technological developments, materials that are in accordance with students' learning styles.

There are still many students who do not fully understand the material on the area of flat shapes, this is because student learning motivation is still in the medium category with very limited use of teaching and learning time. This condition makes multi-directional learning not formed which results in students' mathematics learning outcomes are not optimal. Especially on material that is considered difficult, such as the area of flat shapes. The characteristics of students with various learning styles are also not facilitated by the media used in learning mathematics. Based on this analysis, a product in the form of GAMAVAK interactive media was developed. The product developed was then validated in terms of media, material and learning design. In accordance with the views of Sardi & Anistyasari, (2020) that android-based learning media can increase student motivation and learning outcomes. The development of GAMAVAK interactive media goes through five stages:

In this first stage, the researchers started by making observations at SDN Sidorejo Lor 03. The observations made focused on how the process of applying learning media in the classroom. In addition, researchers also conducted interviews with class teachers. These observations and interviews were conducted in order to explore the potential and problems experienced at SDN Sidorejo Lor 03. The problems and potential that have been obtained are then analysed again to provide a solution for schools in overcoming the problems experienced. The researcher then offers a product to the school to overcome the problems experienced, especially in learning mathematics that can improve student learning outcomes by involving student learning styles at school and outside of school and can involve parents as well. The product that the researcher offers is a simplified and application-based interactive media to assist schools in the implementation of learning that can be accessed in the classroom or outside the classroom. The main point of offering the product is that the service is free and can provide real time data that can be directly received by teachers and can be saved automatically as an application.

The design stage at this stage the researcher starts by compiling a flowchart of the use of GAMAVAK interactive media in learning. The flowchart is used as a reference for the development of the media to be developed. In addition, the flowchart is also intended to provide an overview of how the GAMAVAK interactive media will be used.

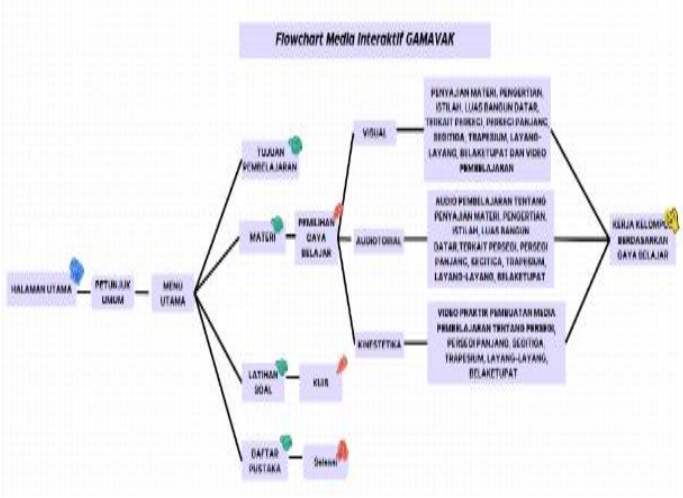

Figure 1. GAMAVAK interactive media flowchart

After completing the compilation flowchart, The next stage carried out by the researcher is to compile a validation instrument. Instrument validation is carried out with the aim of ensuring that the media that has been compiled is not biased and can be used concretely. The researcher involved three experts who are very competent in the fields of media development, materials and learning.

Development Stages (Develop) The development stage consists of two stages. The first stage is the development of learning media which consists of several steps including creating layouts and navigation buttons using Core lDRAW-X7, creating new projects and scenes using Unity 5.6, arranging project display sizes, uploading assets, namely learning media components, creating pages, adding assets to pages, compiling scripts and creating learning media to applications (APK). The second development stage is testing learning media by

installing learning media applications onsmart phone. Here is a view of this application product.

Figure 2 Start Menu

Figure 3 Instruction

Picture 4 Main Menu

Figure 5 Learning Objectives

Figure 6 Material

Picture 7 Visual

Figure 8 Visual Material

Figure 9 Auditorium

Figure 10 Auditory Material

Picture 11 Kinesthetic

Figure 12Kinesthetic Material

Figure 13 LKPD

Figure 14 Quiz

Figure 15 Quiz Worksheet

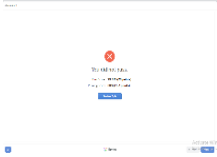

Figure 16 Results Obtained

Figure 17 Library

The first stage of product implementation is to conduct expert validation. This is important to do in order to ensure that the product developed has been declared suitable for use by users. In this case, the experts who validate the product include media experts, material experts and learning experts. Media experts will assess the interactive media using a media validation questionnaire. Aspects that can be seen from the media side include aspects of appearance, instructional quality and technical quality of the media. From the results of the validation, qualitative data is obtained in the form of comments, responses, criticisms and also suggestions that are used for media improvement. While the material expert is tasked with minimising the shortcomings or imperfections of the product in terms of aspects of the quality of the content of the material presented and the suitability of problem solving in the interactive media that has been designed. Learning experts focus on the design and implementation of an effective learning process using the media that has been developed. The validation results from the experts are described in the table below.

Table 2. Recapitulation of Assessment by All Experts

Aspect	Maximum score	Score acquisition	Presentation %
Members of the media	60	53	88%
Subject matter expert	60	54	90%
Learning eember	90	85	94%
Installment-installment			91

Value acquisition frommedia members to GAMAVAK's interactive media products get a percentage of 88% with a very good category and can be continued to the trial stage with some improvements or revisions as needed. The results of the validation of the material expert in the table above obtained a presentation of 90%, with a very good category and can directly use the material for testing with a few revisions. Based on the results of the validation of the learning expert in the table above, a presentation of 94% was obtained, with a category that is very suitable for use in class. researchers are allowed to directly use the learning in class with a few suggestions to be added to the learning design.The results of the recapitulation of media experts, material experts, and learning design experts on each aspect of the GAMAVAK interactive media obtained an average percentage assessment of 91% with the interpretation that the GAMAVAK interactive media is Very Suitable for use by grade V students in mathematics lessons on the material of the area of flat shapes.

After the interactive media product GAMAVAK developed was declared valid by media experts, material experts and learning experts, it was then assessed by the homeroom teacher of grade V. The assessment by the teacher aims to find out whether the interactive media can be tested on students or not. In addition, the assessment from the teacher will also be used as additional improvements to the media developed. At this stage, the researcher gave a questionnaire to the homeroom teacher of grade V as a whole, the teacher's assessment of the interactive media GAMAVAK based on*iSpring*on the material of the area

of flat shapes that have been developed are very feasible and interesting, so they can be tested on students. Based on the results of the teacher assessment instrument that was assessed, the total score was 94% with an average of 45 with the category "very feasible". Based on suggestions and comments from media experts, material experts and teacher assessments of the interactive learning media GAMAVAK that was developed, the media was refined until the final product was obtained and ready to be tested. The trial was limited to a small group, namely 20 students of class V SDN Sidorejo Lor 03 Salatiga. From the calculation above, the percentage of answers from all respondents was 96.9% where this value was in the range of 81-100%, namely "Very Good". This means that the interactive media GAMAVAK declared feasible to use. To prove that students really understand the material, the researcher conducted an effectiveness test after the treatment using Gamavak interactive media. The effectiveness test of the GAMAVAK product functions to determine the feasibility of the GAMAVAK interactive media to be effective and to improve student learning outcomes in mathematics subjects with the material of the area of flat shapes. The researcher took 20 students of grade V SDN Sidorejo Lor 03 Salatiga by giving a pre-test and post-test. The pre-test questions were given to students before learning using GAMAVAK interactive media while the post-test was given after learning the material of the area of flat shapes using the development of GAMAVAK interactive media.

In the pre-test, the average value was 45.5. After the post-test was conducted, the average value was 81. Furthermore, this data was analyzed using the paired sample T test. The paired sample T test is two measuring samples of the same subject against a particular influence or treatment. Furthermore, the results were tested using the paired sample T test with the help of SPSS with the following results.

Table 3. *Paired Samples Statistics*

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	45.5000	20	15.03505	3.36194
	posttest	81.0000	20	9.81406	2.19449

The results of the analysis can be seen the average value of the pre-test got a result of 45.50 and the average value of the post-test got 81.00. Increased by 35.5. The pre-test was carried out before learning using interactive media GAMAVAK. The next step is to determine the hypothesis with the following table results:

Table 4. *Paired Samples Test*

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	pretest - posttest	-35.50000	11.57356	2.58793	-40.91659	-30.08341	-13.718	19	.000

The meaning of the table above is the mean difference of 35.5 is the difference between before and after using the interactive media GAMAVAK. The process carried out the results of the pre-test (before) and post-test (after). The next step is the preparation of the paired sample T test testing steps by formulating the hypothesis as follows:

Ha= There is a significant difference before and after using GAMAVAK interactive media in terms of learning style.

Based on the testing criteria and the results of the analysis in the SPSS table, the significant value is found to be. 000 which means significant. 000 <0.05 which means there is a real difference between the pre-test and post-test data. So it is known that the use of GAMAVAK interactive media is effective in improving student learning outcomes.

Evaluation Stages (*Evaluation*) At the evaluation stage, the researcher did not make many improvements to the product. This is because after the product was tested in the field, there was no input for product improvements from users. However, some things that need to be evaluated by the researcher are that users need to get used to using the GAMAVAK interactive media product. Based on the results of the researcher's observations when testing the product, users or students still need a little help to use the product. This may be natural because this is a new technology used by elementary schools to carry out the learning process. In order for users to get used to using the product, it is necessary to get used to it.

In the discussion there are several stages including media development, learning styles and learning models used. In the first stage, namely the development of interactive GAMAVAK media from the needs analysis that has been carried out, development research can be used as one solution to solving problems by developing interactive GAMAVAK media, because media is the main thing needed when conducting classroom learning in improving student learning outcomes. The use of media in the learning process is very important. This is because it can trigger an increase in student learning outcomes.

The advantages of the interactive media GAMAVAK that was developed are that it is easy to access anywhere and anytime, contains materials, games, quizzes, and can be accessed using the internet or without the internet. This development focuses on the creation of Android-based products to improve the mathematics learning outcomes of grade V students on the material on the area of flat shapes. In accordance with the views of Sardi & Anistyasari, (2020) that Android-based learning media can increase student motivation and learning outcomes. The presence of interactive media GAMAVAK has a very good impact on the learning process. Students enthusiastically show each other their respective abilities in using learning technology.

In the process of using the media, students are enthusiastic about seeing pictures, hearing sounds, watching videos, and some even want to imitate learning practices in the media. After that, they were very enthusiastic about working on the quizzes provided on the last page. Some students who were previously inactive in learning finally activated and completed the existing questions. Thus, the interactive GAMAVAK media is able to motivate students to learn to improve their mathematics learning outcomes in the material on the area of flat shapes. This is because the presence of media in the learning process has a fairly important meaning, where the ambiguity and complexity of the learning materials presented can be helped and simplified by presenting media as an intermediary (Rahmadani, et al., 2019).

Before accessing the media, the teacher first provides an explanation regarding the use of GAMAVAK interactive media in learning. So that when using it, students will no longer have difficulty. In the interactive media GAMAVAK provides quizzes that can be done directly by students to measure their cognitive learning outcomes in the learning and students can see their learning outcomes that appear on the screen *smart phone*. In the GAMAVAK interactive media, group worksheets are also available so that it is possible for students who want to learn in groups. In learning, students can also learn while playing to find objects around them that can increase their knowledge. This is to support students to explore their knowledge more deeply when using GAMAVAK interactive media in mathematics learning. GAMAVAK interactive media also provides a selection of learning styles that can be used by students, namely visual, auditory and kinesthetic learning styles. This is to make it easier for students to recognize their own learning methods and styles to be able to improve their learning outcomes.

Learning styles are closely related to students' strategies in transferring knowledge gained both during the learning process in class and learning at home. By knowing the learning style, students have strategies to improve their learning outcomes (Marpaung. 2015). Learning style (*Learning Styles*) is considered to have an important role in the teaching and learning process. Students who are often forced to learn in ways that are less suitable and less pleasing to them, it is possible that it will hinder their learning process, especially in terms of concentrating when absorbing the information given. In the end, this also affects learning outcomes that are not as optimal as expected (Marpaung. 2015).

Based on the research that has been conducted with a background of different learning styles, the results obtained are that the development of interactive GAMAVAK media is able to influence student motivation and learning outcomes and provide different learning experiences and greater understanding to teachers and students to improve learning outcomes. Each student has a different learning style and each learning style has positive and negative values, as well as its impact on the person and those around them. Students with their respective learning styles have the opportunity to improve their abilities by accessing their learning styles on interactive GAMAVAK media. This is also supported by research conducted by Marpaung, (2015) that one of the secrets to successful learning lies in a person's recognition of themselves, the suitability of teaching style and learning style, their potential, and the consequences that arise. In the learning process, it is also necessary to adjust to the right learning model so that students are free to express their learning style. *Discovery Learnin g*is a learning model that involves students to organize, develop knowledge and skills to solve various problems and is considered capable of answering every problem that exists. This learning model is also often used in classroom learning, where this learning model emphasizes students to find their own material or concepts being studied and the teacher does not provide complete information to students about the concepts or materials being studied. Students must try to solve problems as challenges to face life in the future with their own concepts and learning styles.

The Discovery Learning learning model is able to encourage students to be actively involved in the

learning process by expressing their learning styles in learning and discovering, training students to be more independent, improving students' ability to solve problems, increasing self-confidence, providing opportunities to exchange ideas in groups so that the learning situation is more enjoyable. With the Discovery Learning model, students can be more active, free, and independent in finding materials, solving problems faced, and finding conclusions from learning. According to Dari & Ahmad, (2020) The selection and application of the right learning model can increase motivation, improve critical thinking skills, and make it easier for students to understand lessons and can improve good learning outcomes.

Therefore, GAMAVAK interactive media is an example of the application of technology with the Discovery Learning learning model that can provide students with the freedom to explore their knowledge in the learning process in class and outside the classroom with their learning style. This is because students can learn while playing with their own learning style, thus eliminating the fear of learning mathematics or laziness due to conventional learning. The good and bad learning outcomes depend on the teacher himself, in choosing learning media, learning models and adjusting to learning objectives, expected basic competencies, learning materials, and the level of student development during the teaching and learning process in class (Edlion & Hamdani, 2024).

The results of the product use trial obtained a very good category from users so that it is suitable for use in schools. There are several factors that support the feasibility of the GAMAVAK interactive media product. The first factor is the flexibility of time and also efficiency in delivering learning materials by sending them directly to the user's Android, then installing them and being able to use them anytime and anywhere. The second factor that supports the feasibility of the product is that the use of the product can improve student learning outcomes. The third factor that supports the feasibility of the product is easy access for users and does not require the internet because it is an application and this is a key factor in assessing the feasibility of the product. Several things that can be benefited from the process of implementing technology-based media in online education include more efficient time, ease of storage, variety of methods, and practicality in completing the task (Sari*et al*., 2020;*et al*., 2024).

In addition to several factors that support product feasibility, there are other findings that can hinder the use of interactive GAMAVAK-based media.*iSpring*for teachers and students, namely most of the students use technology only for communication media and recreation, not for education and child development so that control and guidance from teachers and parents are needed. In addition, not all students have*smart phone*to access the media.

Conclusion

Based on the findings and data obtained in this study, it is concluded that the development of iSpring-based GAMAVAK interactive media to improve student learning outcomes in terms of learning styles in mathematics subjects in grade V has been validated in various aspects. This GAMAVAK interactive media is considered valid from the suitability of competencies and learning objectives, systematic presentation, display quality, instructional quality, technical quality of the media, suitability of material content, suitability of problem solving, content and suitability with the principles of compiling teaching modules. GAMAVAK interactive media has proven effective in improving student learning outcomes, which confirms its potential in improving students' learning styles as a whole in the class.

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Author Contributions

Conceptualization, S., K. methodology, S., K.; software, S., K; validation, D., K., and A., W; formal analysis, W.; investigation, S., K; resources, W.; data curation, W.; writing—original draft preparation, S., W., K; writing—review and editing, W.; visualization, D.; supervision, A., D.; project administration, S.; funding acquisition, S.

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Conflicts of Interest

The authors declare no conflict of interest.

References

Borg, J. W., & Gall, D. M. (2003). *Educational Research*. New Delhi: Phi Learning Private Limited. https://books.google.co.id/books/about/Educational_Research.html?hl=id&id=_rRhQgAACAAJ&redir_esc=y

Dari, F. W. ., & Ahmad, S. . (2020). Discovery Learning Model as an Effort to Improve Critical Thinking Skills of Elementary School Students.*Tambusai Education Journal*. Vol. *4 No.* (2), 1469–1479. https://jptam.org/index.php/jptam/article/view/612/539

Edlino, Y., & Hamdani, H. (2024). Android-Based Ispring Suite Interactive Learning Media Design.*Journal of Electrical Engineering Education*, 5(1), 59-66. https://doi.org/10.24114/jgk.v8i2.53983

Hariyadi, A. B., & Hariyati, N. (2020). The Importance of Information Technology-Based Learning Facilities on Student Learning Outcomes.*Journal of Educational Management Inspiration,* 8(4), 558–569. https://id.scribd.com/document/680027788/RELATE-JURNAL-KE-2

Hidayat, M., Rahmi1, U., Jasrial, Zuwirna. (2025). Development of Interactive IPAS Teaching Material Based on the Inquiry Model Using the Powtoon Application for Fourth Grade Elementary School Students. *Journal of Science Education Research.*11(8), 949–957. *https://jppipa.unram.ac.id/index.php/jppipa/article/view/12235/8199*

Junierissa Marpaung (2015). The Influence of Learning Styles on Student Achievement.*KOPASTA Journal*, 2 (2), (2015) 13 – 17. https://doi.org/10.33373/kop.v2i2.302

Meyly Olivia Worang, Vivi Peggie Rantung, Mario Tulenan Parinsi (2021). Multimedia-Based Learning Media for Multimedia Courses.*Journal of Information and Communication Technology Education*. Volume 1 Number 5.ISSN 2798-141X.https://www.researchgate.net/publication/367772537_media_pembelajaran_berbasis_multimedia_untuk_mata_kuliah_multimedia

Nasution, B. M. (2021). Increasing Thematic Learning Outcomes Through Powerpoint Media In Class Iv Students Of Elementary School 0804 Botung Academic Year 2020/2021. *Indonesian Journal Of Basic Education*, *4*(2), 6. https://download.garuda.kemdikbud.go.id/article.php?article=2805651&val=24904&title=Increasing%20Thematic%20Learning%20Outcomes%20Through%20Powerpoint%20Media%20In%20Class%20Iv%20Students%20Of%20Elementary%20School%200804%20Botung%20Academic%20Year%202020202021

Rahmi Ramadhani, Rofiqul Umam, Abdurrahman Abdurrahman, and Muhamad SYAZALI (2019). The Effect of Flipped-Problem Based Learning Model Integrated with LMS-Google Classroom for Senior High School Students. *Journal for the Education of Gifted Young Scientists*, 7(2), 137-158, June 2019 e-ISSN: 2149- 360X. https://scispace.com/pdf/the-effect-of-flipped-problem-based-learning-model-57i8u6p8pk.pdf

Rohyadi. E & Atika.C (2024). The Important Role of Information and Communication Technology (ICT) in Education.*Scientific Journal of Elementary Education*, Print ISSN : 2477-2143 Online ISSN : 2548-6950 Volume 09 Number 04.https://journal.unpas.ac.id/index.php/pendas/article/view/18942/9244

Rosida, I., Harahap, A. N., Alfiyanti, E., Wattimury, Y. A., & Pratiwi, S. (2022). Exploring the phenomenon of fear of missing out (FOMO): The emergence, practice, and its impact on social media user. Insaniyat : *Journal of Islam and Humanities*, 6(2), 5-12. https://doi.org/10.15408/insaniyat.v6i2.25461

Sari R.A & Nurmilawati M. (2023). Analysis of Learning Media Needs for 4th Grade Students of Elementary School Laboratory of National Examination of Indonesian Teacher Training College Kediri on the Area & Perimeter of Flat Shapes. 6th Education and Learning Seminar.file:///C:/Users/serly/Downloads/cp_wikan,+analisis+kebutuhan+media+3889-Article+Text-14484-1-10-20230812+1285-1290.pdf

Sari, D. P., & Atiqoh, N. S. (2020). The relationship between public knowledge and compliance with mask use as an effort to prevent COVID-19 in Ngronggah.*INFOKES Journal*, 10(1), 52– 55. https://scispace.com/pdf/hubungan-antara-pengetahuan-masyarakat-dengan-kepatuhan-pfk5n2ojy2.pdf

Sugiyono, D. (2017). Quantitative, Qualitative and R & D Research Methods. Bandung: Alfabeta.https://elibrary.bsi.ac.id/readbook/206060/metode-penelitian-kuantitatif-kualitatif-dan-r-d

Ulwa Humairok GL, & Herry Widyastono (2020). Comparative Analysis of Educational Technology for Children with Special Needs in Indonesia and European Countries (Finland, Germany, England, Netherlands).*BEST Journal.* Vol.3 No.1 Hal. 32 – 38. ISSN (Online): 2654 – 4652. https://doi.org/10.30743/best.v3i1.2433

Law of the Republic of Indonesia Number 20 of 2003. National Education

System.https://peraturan.bpk.go.id/details/43920/uu-no-20-tahun-2003

Wahyudi, Dani Kusuma & Adi Winanto (2024). Web-based Creative Learning and Information System for Rebranding Christian Schools. *Indonesian Journal of Education.* Volume 13, Number 2. pp. 345-356 P-ISSN: 2303-288X E-ISSN: 2541-7207 Open Access: https://doi.org/10.23887/jpiundiksha.v13i2.73855

http://dx.doi.org/10.1037/0021-843X.102.2.203 Wanti Wanti, C. Y., Hadiyanto, Desyandri, & Erita, Y. (2024). Development of Powtoon Media in IPAS Learning Assisted by The PBL Model in Fourth Grade Elementary School. *Research Journal*Science Education, 10(10), 7534–7540.https://doi.org/10.29303/jppipa.v10i10.8976