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Quizizz-Assisted Interactive Powerpoint Media on Human Respiratory Organ Material

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ABSTRAK

Keterbatasan siswa terkait perangkat handphone membuat siswa kesulitan dalam mengikuti proses pembelajaran daring. Kurangnya variasi media pembelajaran membuat sebagian siswa kurang tertarik untuk belajar dan kurangnya pemahaman siswa terhadap materi yang diajarkan. Penelitian ini merupakan penelitian pengembangan. Penelitian ini bertujuan untuk mengetahui rancang bangun dan menguji validitas media Powerpoint interaktif. Penelitian ini menggunakan jenis model pengembangan ADDIE. Jenis data yang dikumpulkan pada penelitian ini adalah data kuantitatif dan data kualitatif. Subjek pada penelitian ini meliputi 3 ahli dan 3 siswa pada uji coba perorangan serta 9 siswa pada uji coba kelompok kecil. Metode pengumpulan datanya menggunakan metode angket. Hasil penelitian ini meliputi (1) rancang bangun media Powerpoint interaktif ini sesuai dengan model ADDIE yang digunakan dengan 5 tahapan pengembangan. (2) media Powerpoint interaktif dinyatakan layak berdasarkan: (a) hasil review ahli isi pembelajaran dengan kualifikasi sangat baik (90%), (b) hasil review desain pembelajaran dengan kualifikasi sangat baik (90%), (c) hasil review media pembelajaran dengan kualifikasi (90%), (d) hasil uji coba perorangan dengan kualifikasi sangat baik (96,66%), (e) hasil uji coba kelompok kecil dengan kualifikasi sangat baik (95%). Berdasarkan hasil uji coba tersebut dapat disimpulkan bahwa media Powerpoint interaktif berbantuan Quizizz ini layak digunakan pada proses pembelajaran IPA kelas V SD.

ABSTRACT

Student limitations related to cellphone devices make it difficult for students to follow the online learning process. The variety of learning media makes some students less interested in learning, and students lack understanding of the material being taught. This research is development research. This study aims to determine the design and test the validity of interactive Powerpoint media. This study used the ADDIE development model type. The types of data collected in this study are quantitative data and qualitative data. The subjects in this study included three experts and three students in individual trials, and nine students in small group trials. The data collection method uses the questionnaire method. The results of this study include (1) the design of this interactive Powerpoint media following the ADDIE model used with five stages of development. (2) Interactive Powerpoint media is declared feasible based on: (a) the results of expert reviews of learning content with excellent qualifications (90%), (b) the results of learning design reviews with excellent qualifications (90%), (c) the results of reviews of learning media with qualifications (90%), (d) the results of individual trials with excellent qualifications (96.66%), (e) the results of small group trials with excellent qualifications (95%). Based on the trial results, it can be concluded that this Quizizz-assisted interactive Powerpoint media is suitable for use in the science learning process of grade V elementary school.

1. INTRODUCTION

Education is the main thing that can support and support the progress of a nation (Inawan et al., 2022; Yamin & Karmila, 2020; Yanti et al., 2014). Schools are educational institutions that organize formal learning activities with supporting elements such as principals, teachers, school staff, and students who can teach students from not knowing to know. A professional teacher is required to display his skills in front of the class. One of the components of this expertise is the ability to deliver subject matter effectively and

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efficiently. Teachers need to know various types of innovative learning media in delivering material so that learning is more interesting and increases students' curiosity. So that students are not easily bored, students are more active in participating in learning activities, and this can improve student learning outcomes (Az' Zahra et al., 2021; Dewanto et al., 2021; Setiawan et al., 2022). The development of the education era is always changing, both in the curriculum, learning media, and so on. In schools that are required to implement the 2013 curriculum, students are expected to be able to think critically and creatively. In the 2013 curriculum, which applies integrated thematics, integrated thematics are fun learning, concrete learning, learning while playing, meaningful learning, and no separation of fields of study or subject matter. Curriculum 2013 lesson content uses a scientific approach with 5 M principles: observing, asking questions, gathering information, reasoning, and communicating. One of the subjects taught in elementary schools is science. Science is often referred to as science. Science is knowledge about natural phenomena that require media to convey material (Hayyuningtyas & Batubara, 2021; Murtiani, 2018).

However, some students think that the material contained in the science content is too much and difficult to understand, so it is difficult to understand, and students get bored easily participating in learning activities (Illahi et al., 2021; Prasetya et al., 2022; Yuniasih et al., 2018). The causes of difficulties in learning science are too many foreign terms, too dense material, students seem to want to memorize the material, limited learning media, students seem difficult in understanding material without the availability of media, teachers who tend to dominate learning, teacher mastery of the material is weak and too monotonous (Imanuel, 2015). The teacher considers the learning media inappropriate because it has not been able to deliver the material optimally, as seen by some students who do not understand the material. The observations and interviews at SD Negeri 3 Kerambitan showed that during the covid-19 pandemic during online learning, the media used by teachers was only using WhatsApp Groups, never using Zoom Meetings, and only sticking to the material in the Student Worksheets. It is because schools located in rural areas have difficulties with supporting technology, that some students who do not have their cellphones only rely on their parents' cellphones so that teachers have problems when doing learning due to lack of learning media, making it difficult for students to understand the material on the content. Science lessons, especially the material for human respiratory organs, because of their view that there is too much material in the content of science lessons, so it is not easy to understand. It impacts some students being less interested, easily bored, and in participating in learning activities, some students are not very active.

The solution to overcome these problems is by learning media. Learning media can channel messages (learning materials) to stimulate attention, interests, thoughts, and feelings (Badruttamam, 2019; Juniari & Putra, 2021; Wardani & Syofyan, 2018). Learning media is a tool or supporting media used in learning activities so that there is interaction between teachers and students that can stimulate students' minds so that students do not get bored easily participating in learning activities (Ardiani, 2022; Dewi & Izzati, 2020). There are several types of learning media that are used to deliver messages in learning, one of which is interactive learning media. Interactive learning media is a digital product or service (multimedia) provided by teachers to students by presenting learning content such as text, moving images or animations, video, and audio to video games (Rahmi et al., 2019; Zulhelmi et al., 2017). One of them is using PowerPoint media. Powerpoint interactive media has many types, one of which is Powerpoint-based interactive media. Powerpoint is a media presentation that can be used to assist the process of delivering learning materials.

Previous research findings stated that the Powerpoint-based learning media developed was valid (Syavira, 2021). Interactive Powerpoint media has very good criteria and is suitable for use in the learning process for elementary school students (Rahayu et al., 2019). Interactive PowerPoint media has very good validity and deserves to be used as a learning media (Annisa & Simbolon, 2018). Although there have been many developments regarding powerpoint-based interactive learning media, the research that has been developed has not yet developed interactive PowerPoint media assisted by Quizizz. So that in this study, interactive learning media assisted by Quizizz will be developed for human respiratory organs. This study aims to determine the design and test the validity of interactive Powerpoint media assisted by Quizizz for the material of human respiratory organs for fifth-grade science content.

2. METHOD

This research is development research conducted at SD Negeri 3 Krambitan. This interactive Powerpoint media was developed using the ADDIE development model. The subjects in this study included three experts and three students in individual trials, and nine students in small group trials. These experts include content experts, learning design experts, and learning media experts. The students were fifth graders of SD Negeri 3 Krambitan who were involved in individual trials and small group trials. In the product trial stage, the researcher used individual test subjects in this study, namely three fifth-grade students of SD N 3 Kerambitan who had low, medium, and high learning outcomes. Then in this

small group trial stage, the researchers used as many as nine fifth-grade students of SD Negeri 3 Kerambitan. The students were selected with different characteristics or abilities. Three students had high learning outcomes, three had moderate learning outcomes, and three had low learning outcomes.Data collection methods used are observation, interviews, and questionnaires. The data collection instrument used in this study was a questionnaire method. Questionnaires are useful for collecting data related to the product's feasibility. This questionnaire will be filled out by learning content experts, learning design experts, learning media experts, and fifth-grade students of SD Negeri 3 Kerambitan. This questionnaire is used to get the eligibility level for interactive Powerpoint media assisted by Quizizz. The questionnaire grids will be presented in Table 1, Table 2, Table 3, and Table 4.

Table 1. Learning Content Expert Instrument

No	Aspect	Indicator	No. Item	Total Items
(1)	(2)	(3)	(4)	(5)
1	Curriculum	a. The suitability of the material with the Basic Competence.	1	
		b. The suitability of indicators with Basic Competence.	2	3
		c. The suitability of the material with the learning objectives.	3	
2	Material	a. Material coverage.	4	
		b. The suitability of the content of the material.	5	
		c. The suitability of the material description with relevant examples.	6	4
		d. The material is easy to understand.	7	
3	Language	a. The accuracy of the use of terms following the rules of the Indonesian language	8	1
4	Evaluation	a. The suitability of the evaluation questions with the material	9	
		b. The suitability of the level of difficulty of the question with competence	10	2
		Total		**10**

(Suartama, 2016)

Table 2. Learning design expert instrument

No	Aspect	Indicator	No. item	Total Item
(1)	(2)	(3)	(4)	(5)
1	Purpose	a. Clarity of learning objectives.	1	2
		b. The suitability of learning objectives with learning materials.	2	
2	Strategy	a. Submission of material provides a free flow of navigation.	3	
		b. Submission of material provides a free flow of navigation.	4	
		c. The examples are presented clearly.	5	5
		d. Presentation of the material following the characteristics of students.	6	
		e. Providing practice questions for understanding concepts.	7	
		f. The attractiveness of the presentation of the material.	8	1
3	Evaluation	a. The suitability of the questions with competency indicators.	9	2
		b. Providing proper feedback.	10	
		Total		**10**

(Suartama, 2016)

Table 3. Learning media expert instrument

No	Aspect	Indicator	No. Item	Total Item
(1)	(2)	(3)	(4)	(5)
1	Text	a. The accuracy of the font selection.	1	
		b. The accuracy of the selection of the font size.	2	4
		c. Text clarity.	3	
		d. Text presentation accuracy.	4	
2	Picture	a. The use of images supports understanding of the material.	5	3
		b. The accuracy of the image presentation.	6	

No	Aspect	Indicator	No. Item	Total Item
(1)	(2)	(3)	(4)	(5)
		c. The accuracy of the selection of image quality.	7	
3	Color	a. Background color match	8	2
		b. Clarity of color in pictures and text.	9	
4	Audio	a. Sound clarity.	10	
		b. The accuracy of using sound effects.	11	3
		c. The accuracy of the use of the background.	12	
5	Technical	a. Ease of use of Quizizz-assisted interactive Powerpoint media.	13	1
		Total		**13**

(Suartama, 2016)

Table 4. Instruments for individual trials and small group trials

No	Aspect	Indicator	No. Item	Total Item
(1)	(2)	(3)	(4)	(5)
1	Visualization	1) The attractiveness of learning media	1	1
2	Material	2) Easy to understand the material	2	
	Presentation	3) Clarity of material description	3	3
		4) Balance of materials with evaluation	4	
3	Text	5) Quality of text used	5	2
		6) Clarity of the text used	6	1
4	Picture	7) Image quality used	7	2
		8) Clarity of images used	8	
5	Motivation	9) Give the spirit of learning motivation	9	1
6	Evaluation	10) Suitability of questions	10	1
		Total		**10**

(Nida et al., 2020)

This development research also used three data analysis techniques, qualitative descriptive analysis techniques, and quantitative descriptive analysis. This descriptive analysis technique was used to process data from the test results of subject content experts, learning design experts, and student trials. This data analysis technique is carried out by grouping information from qualitative data in the form of input, feedback, criticism, and suggestions for improvement contained in the questionnaire. The results are used to revise product development. Then the quantitative descriptive analysis technique used in taking satisfaction used the following provisions. In this study, the Likert scale used is a four-scale study categorized in Table 5.

Table 5. Likert scale rating category

No	Score	Response
1	1	Strongly Disagree
2	2	Disagree
3	3	Agree
4	4	Strongly agree

(Sugiyono, 2017).

3. RESULT AND DISCUSSION

Result

The design of this Quizizz-assisted interactive Powerpoint media development uses the ADDIE development model, which consists of five stages: analyze, design, development, implementation, and evaluation. In the first stage, namely analysis, learning needs were analyzed by conducting interviews with fifth-grade teachers at SD Negeri 3 Kerambitan. The interviews showed that the lack of learning media made it difficult for students to understand the material because they believed that the material contained in the science content was too much, so it was difficult to understand. Besides that, the teacher only stuck to the Student Worksheet. It impacts some students being less interested, easily bored, and in

participating in learning activities, some students are not very active. Based on this, it is expected that the developed Quizizz-assisted interactive Powerpoint media can explain the content of science lessons following the teaching materials. The second analysis is material. At this stage, the materials relevant to the developed product are selected. The method used to analyze the material is interviews with fifth-grade teachers at SD Negeri 3 Kerambitan. Based on the analysis of the material carried out, the material used is material about the human respiratory organs in the content of science lessons. The third is the determination of Basic Competencies and Indicators. The determination of Basic Competencies and Indicators is carried out following the material analysis that has been carried out on the material of human respiratory organs in the content of science lessons, with the aim that the developed media can help students to understand teaching materials that are following the demands of competence in learning. The basic competencies and indicators are described in Table 6.

Table 6. Basic Competencies and Indicators

No	Basic Competencies	Indicators
1	3.2 Explain the respiratory organs and their functions in animals and humans, as well as how to maintain the health of human respiratory organs.	3.2.1 Analyzing the respiratory organs and their functions in humans. 3.2.2 Discover the respiratory organs and their functions in humans. 3.2.3 Comparing the respiratory organs and their functions in humans.

In the second stage, namely the design stage, learning media design is carried out according to the needs of science learning at SD Negeri 3 Kerambitan. The software used in the development of this media is Powerpoint and Quizizz. Media is designed using flowcharts and storyboards. The media is developed in an attractive and easy-to-use manner for elementary students. In addition, at this stage, lesson plans and product assessment instruments are carried out in the form of a learning content expert assessment questionnaire, a learning design expert assessment questionnaire, a learning media expert questionnaire, an individual test questionnaire, and a small group test questionnaire. The design process at this stage can be seen in Figure 1.

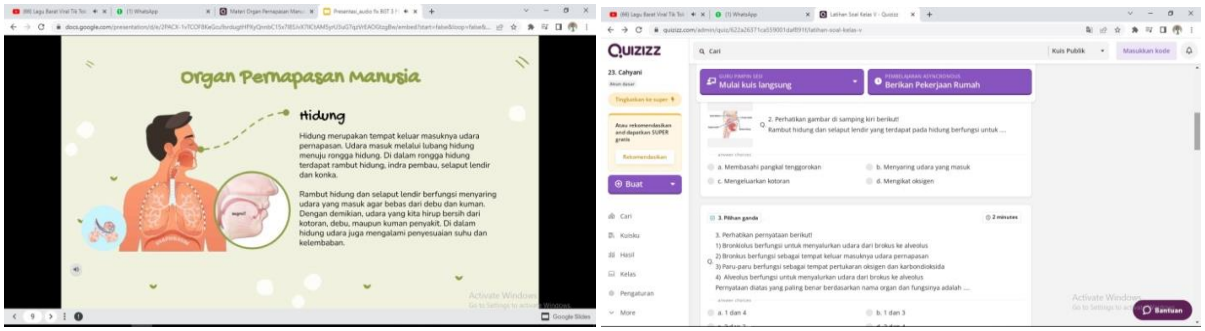

Figure 1. The process of designing interactive PowerPoint media

The third stage, namely development, begins with selecting a Powerpoint template on slidesgo.com and then making learning media materials using Powerpoint. While quizzes on learning media are made using Quizizz. Files that are originally PowerPoint are exported to Google Drive and in Web publications. Then the Powerpoint is published on the Web as a link copied and inserted into Quizizz. Media is made by taking into account several things, such as the accuracy of the selection of type and font size, the accuracy of the selection of images and colors, the accuracy and clarity of the audio, the accuracy of the video selection, and the ease of use of the media. The finished product is tested for feasibility by one learning content expert, one learning design expert, and one learning media expert. After the media was declared feasible, the developed media was tested through an individual trial phase to find out the responses of the fifth-grade students of SD Negeri 3 Kerambitan, which consisted of one student with high learning achievement, one student with moderate learning achievement, one student with high learning achievement low and tested through a small group trial phase to determine the response of the fifth-grade students of SD Negeri 3 Kerambitan consisting of nine students, one group consisting of three students with high, medium and low learning outcomes.

In the learning content expert instrument, several aspects of the assessment of interactive Powerpoint media are assisted by Quizizz. These aspects include curriculum aspects, material aspects,

language aspects, and evaluation aspects. Judging from the aspect of learning content, this Quizizz-assisted interactive Powerpoint media has very good qualifications with a percentage of 90%. From the learning design aspect, several aspects are assessed, namely aspects of objectives, strategies, and evaluations. The media developed in this study had a learning design feasibility level of 90% with very good qualification criteria. The learning media aspect shows that the qualifications of Quizizz-assisted interactive Powerpoint media are influenced by several media aspects, including text aspects, image aspects, color aspects, audio aspects, and technical aspects. The media developed in this study had a learning media feasibility level of 90% with very good qualification criteria. This trial phase is an individual trial and a small group trial. In the review of individual trials, it is known that the interactive Powerpoint media assisted by Quizizz obtained a 96.66% achievement rate, which was a very good qualification. Based on the results of the review in the very good category, the interactive Powerpoint media assisted by Quizizz that had been developed received a very good response from students. It shows that the Quizizz-assisted interactive Powerpoint media that has been developed is valid or feasible to be used in the learning process in the classroom, especially in the fifth grade of human respiratory organ material for science lessons. The fourth stage is implementation. The stages that need to be carried out at this stage are the media that has been validated through reviews by learning content experts, learning media experts, and learning design experts. Stages of product testing through individual trials and small group trials. The fifth stage, namely evaluation, at the evaluation stage is carried out by conducting formative evaluation activities. Formative evaluation is carried out to measure or assess learning products through reviews of experts (learning content experts, learning design experts, learning media experts) and student assessments.

Discussion

The results of this Quizizz-assisted interactive Powerpoint media review were determined based on the evaluation results from experts, including learning content experts, learning design experts, (3) learning media experts, individual trials, and small group trials. These results are known by using the questionnaire method. First, this Quizizz-assisted interactive PowerPoint media is suitable for the science learning process for human respiratory organs in fifth-grade elementary school. There are several aspects of Quizizz-assisted interactive Powerpoint media assessment. These aspects include curriculum aspects, material aspects, language aspects, and evaluation aspects. The acquisition is influenced by several things, including the suitability of the material with core competencies, basic competencies, indicators and learning objectives, the scope of the material, the suitability of the content of the material, the suitability of the description of the material with relevant examples, the material that is easy to understand, the accuracy of the use of terms following Indonesian language rules, the suitability of the evaluation with the material and the suitability of the level of difficulty of the questions with competence. Learning media cannot stand alone but is related to other learning components, such as objectives, competencies, and teaching materials (Mumri & Aini, 2019; F. A. B. Putri & Rezkita, 2019). ICT-based media is important in increasing students' understanding of the material. Based on the expert review of learning content results, it is known that the developed Quizizz-assisted interactive Powerpoint media is suitable for teaching and learning activities.

Second, in terms of learning design aspects, several aspects are assessed, namely aspects of objectives, strategies, and evaluations. The media developed in this study had a very good level of achievement of the feasibility of learning design. Several things that affect these qualifications are clarity of learning objectives, suitability of learning objectives with learning materials, delivery of material providing a free navigation flow, delivery of material motivating to learn, giving examples presented, presenting material according to student characteristics, providing practice questions for understanding concepts, the attractiveness of material presentation, suitability of questions with indicators and providing appropriate feedback. Based on the input, comments, and suggestions of learning design experts, some suggestions are revised in the evaluation questions section on the media that must be at the HOTS level. The media that Quizizz-assisted interactive Powerpoint media that has been developed is valid or feasible to be used as a learning medium in the learning process in the classroom, especially in the fifth grade of human respiratory organ material for science lessons. In the current era of education, educators are more flexible in developing the learning process so that information or material can be conveyed more effectively and efficiently (Cahyani & Suniasih, 2022; Murtiningsih et al., 2018; Qosyim & Priyonggo, 2018). With this, the quality of education will be higher because it is carefully prepared.

Third, from the aspect of learning media, it shows that the qualification of interactive Powerpoint assisted by Quizizz is influenced by several media aspects, including text, image, color, audio, and technical aspects. The media developed in this study had a very good level of achievement of the feasibility of learning media. Several things that affect these qualifications are the accuracy in choosing the typeface,

the accuracy in choosing the size of the font, the clarity of the text, the accuracy of the presentation of the text, the use of images to support the understanding of the material, the accuracy of the presentation of the images, the accuracy of the selection of image quality, the suitability of the background color, the clarity of the colors in the images and text, voice clarity, accuracy in using sound effects, accuracy in using back sound, and ease of use of Quizizz-assisted interactive Powerpoint media. Based on input, comments, and suggestions from learning media experts, some suggestions are revised, the font size is too small, and the presentation of the material should be fullscreen. The results of the learning media expert review that the interactive PowerPoint media assisted by Quizizz that has been developed is feasible to be used as a learning medium in the learning process in the classroom, especially in the fifth grade of human respiratory organ material for science lessons. Learning media plays an important role in the learning process of delivering learning materials. In the era of rapid technological development today, educators have broad creative opportunities to develop and create learning for educational purposes (Damayanti & Raharjo, 2020; Harahap, 2019; Saputra & Putra, 2021). Technological progress is the main tool that can be used in creating the learning process following the wishes of educators. Learning media is a very important learning tool for students and teachers in the learning process that is useful to help deliver learning materials (Astuti et al., 2021; Putra, 2021; Zahra et al., 2021). Learning media that follows the learning material, the learning process will be more effective and will help students understand the material (Mudasih & Subroto, 2019; Setiawan et al., 2022).

This finding is reinforced by previous research stating that the Powerpoint-based learning media developed is valid (Irfan et al., 2019; Setiawan et al., 2022; Syavira, 2021). Interactive PowerPoint media has very good criteria and is suitable for use in the learning process for elementary school students (Iswanto et al., 2018; E. F. Putri, 2021; Rahayu et al., 2019). Interactive PowerPoint has very good validity and deserves to be used as a learning media (Annisa & Simbolon, 2018; Sari et al., 2020). This research implies that the learning media in the form of interactive Powerpoint media assisted by Quizizz is considered capable of making learning activities more interesting and meaningful. Quizizz-assisted interactive PowerPoint media can also attract students' attention in the learning process and motivate students to be more active in learning. In addition, Quizizz-assisted interactive Powerpoint media can be an alternative learning media, offline and online.

4. CONCLUSION

The results or products in the research are in the form of interactive Powerpoint media assisted by Quizizz for material on human respiratory organs for fifth-grade science content. This interactive Powerpoint media product was developed using the ADDIE model with five stages of development. Based on the results of the validity by experts and testing on students, it can be concluded that the interactive Powerpoint media assisted by Quizizz is appropriate for the science learning process for the fifth-grade human respiratory organ material.

5. REFERENCES

Annisa, N., & Simbolon, N. (2018). Pengembangan Media Pembelajaran Interaktif Ipa Berbasis Model Pembelajaran Guided Inquiry Pada Materi Gaya dI Kelas IV SD Negeri 101776 Sampali. *School Education Journal PGSD FIP Unimed*, *8*(2), 217–229. https://doi.org/10.24114/sejpgsd.v8i2.10199.

Ardiani, K. E. (2022). Multimedia Pembelajaran Interaktif Berorientasi Teori Belajar Ausubel pada Muatan IPA Materi Sumber Energi. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *6*(1), 26–35. https://doi.org/10.23887/jppp.v6i1.45159.

Astuti, D. P., Nuraini, N. L. S., & Roebyanto, G. (2021). Pengembangan Multimedia Interaktif Berbasis Android dengan Model Problem Based Learning Muatan Matematika Materi Bangun Ruang Kelas V SD. *Jurnal Pembelajaran, Bimbingan, Dan Pengelolaan Pendidikan*, *1*(8), 653–659. https://doi.org/10.17977/um065v1i82021p653-659.

Az' Zahra, F., Sekaringtyas, T., & Hasanah, U. (2021). Pengembangan Poster Interaktif Berbasis Android Pada Muatan Ipa Kelas Iv Sekolah Dasar. *OPTIKA: Jurnal Pendidikan Fisika*, *5*(2), 131–144. https://doi.org/10.37478/optika.v5i2.1066.

Badruttamam, C. A. (2019). Pengembangan Media Pembelajaran Matematika Materi Perkalian Bilangan Bulat Berbantuan Komputer Untuk Siswa Kelas IV SD/MI. *EL Bidayah: Journal of Islamic Elementary Education*, *1*(1), 97–110. https://doi.org/10.33367/jiee.v1i1.686.

Cahyani, N. M. S., & Suniasih, N. W. (2022). Media Pembelajaran Interaktif Berbasis Kontekstual pada Materi Jenis-Jenis Usaha dan Kegiatan Ekonomi di Indonesia Muatan IPS Kelas V SD. *Jurnal*

Penelitian Dan Pengembangan Pendidikan, *6*(1), 1–11. https://doi.org/10.23887/jppp.v6i1.45203.

Damayanti, A. N., & Raharjo, R. (2020). Validitas Flipbook Interaktif pada Materi Sistem Pernapasan Manusia untuk Melatihkan Kemampuan Berpikir Kritis Siswa Kelas XI SMA. *Berkala Ilmiah Pendidikan Biologi (BioEdu)*, *9*(3), 443–450. https://doi.org/10.26740/bioedu.v9n3.p443-450.

Dewanto, I. J., Hidayat, S., & Sukmayadi, D. (2021). Pengembangan Pembelajaran Inkuiri Berbantuan Multimedia Interaktif Pada Mata Pelajaran Ipa Kelas V Sd. *Jurnal Muara Pendidikan*, *6*(1), 76–89. https://doi.org/10.52060/mp.v6i1.490.

Dewi, M. D., & Izzati, N. (2020). Pengembangan Media Pembelajaran PowerPoint Interaktif Berbasis RME Materi Aljabar Kelas VII SMP. *Delta: Jurnal Ilmiah Pendidikan Matematika*, *8*(2), 217. https://doi.org/10.31941/delta.v8i2.1039.

Harahap, H. S. (2019). Pengembangan Media Ajar Interaktif Biologi Berbasis Macromedia Flash Dalam Komputer Pada Materi Sistem Pernapasan Manusia. *Jurnal Pembelajaran Dan Biologi Nukleus*, *5*(2), 54–66. https://doi.org/10.36987/jpbn.v5i2.1356.

Hayyuningtyas, K., & Batubara, H. H. (2021). Pengembangan Media Pembelajaran Interaktif Berbasis Powerpoint Dan Ispring Di Android Untuk Meningkatkan Efektifitas Pembelajaran Ipa Di Kelas 3 Sd. *MUBTADI: Jurnal Pendidikan Ibtidaiyah*, *3*(1), 61–69. https://doi.org/10.19105/mubtadi.v3i1.4804.

Illahi, T. A. R., Rahmawati, I., & Setyawan, A. (2021). Pemanfaatan Media Interaktif Powerpoint untuk Meningkatkan Hasil Belajar Kognitif Muatan IPA Siswa Kelas V SDN Sumurwelut 1/438 Surabaya. *Nuris Journal of Education and Islamic Studies*, *1*(2), 130–141. https://doi.org/10.52620/jeis.v1i2.11.

Inawan, D. S., Sulthoni, S., & Ulfa, S. (2022). Pengembangan Multimedia Interaktif IPA SD Kelas IV Materi Makan dan Dimakan Antar Makhluk Hidup. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *5*(2), 151–161. https://doi.org/10.17977/um038v5i22022p151.

Irfan, I., Muhiddin, M., & Ristiana, E. (2019). Pengembangan Media Pembelajaran IPA Berbasis Powerpoint di Sekolah Dasar. *Indonesian Journal of Primary Education*, *3*(2), 16–27. https://doi.org/10.17509/ijpe.v3i2.21765.

Iswanto, E., Suharmono, R., & Hidayat, S. (2018). Pengaruh Penggunaan Media Pembelajaran Berbasis Powerpoint Dan Buku Teks Terhadap Hasil Belajar Ilmu Pengetahuan Alam (Ipa) Materi Tata Surya Siswa Kelas Vi Semester Ganjil Tahun Pelajaran. *Jurnal of Education Technologi and Innovation (JETI)*, *1*(2), 7–20. https://doi.org/10.31537/jeti.v1i2.

Juniari, I. G. A. O., & Putra, I. M. (2021). Pengembangan Media Pembelajaran Multimedia Interaktif Model DDD-E Pada Muatan Pelajaran IPA Kelas V SD. *Jurnal Edutech Undiksha*, *9*(1), 140–148. https://doi.org/10.23887/jeu.v9i1.33091.

Mudasih, I., & Subroto, W. T. (2019). Comparison of Student Learning Outcomes Through Video Learning Media with Powerpoint. *International Journal of Educational Research Review*, *4*(2), 183–189. https://doi.org/10.24331/ijere.517997.

Mumri, A. F., & Aini, S. (2019). Pengembangan Media Pembelajaran Powerpoint Interaktif berbasis Inkuiri Terbimbing pada Materi Reaksi Redoks Kelas XII SMA/MA. *Edukimia*, *1*(1), 30–37. https://doi.org/10.24036/ekj.v1.i1.a3.

Murtiani, T. (2018). Peningkatan Keterampilan Sosial Ipa Materi Organ Pernapasan Manusia Melalui Model Snowball Throwing Pada Siswa Kelas V Sd 5 Gondangmanis Kudus. *Malih Peddas (Majalah Ilmiah Pendidikan Dasar)*, *8*(1), 71. https://doi.org/10.26877/malihpeddas.v8i1.2272.

Murtiningsih, C., Dewi Koeswati, H., & Giarti, S. (2018). Peningkatan Hasil Belajar Ipa Melalui Penerapan Metode Inkuiri Berbantuan Video Interaktif Pada Siswa Kelas Iii Sd. *Pendekar : Jurnal Pendidikan Berkarakter*, *1*(1), 309. https://doi.org/10.31764/pendekar.v1i1.377.

Nida, D. M. A. A., Parmiti, D. P., & Sukmana, A. I. W. I. Y. (2020). Pengembangan Media Kartu Bergambar Berorientasi Pendidikan Karakter Pada Mata Pelajaran Bahasa Bali. *Jurnal Edutech Undiksha*, *8*(1), 16. https://doi.org/10.23887/jeu.v8i1.25393.

Prasetya, A., Ulfa, S., & Susilaningsih, S. (2022). Pengembangan Media Pembelajaran Interaktif Materi Sistem Pernapasan Pada Manusia Untuk Sekolah Dasar. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *5*(2), 111–120. https://doi.org/10.17977/um038v5i22022p111.

Putra, I. M. J. (2021). Pengembangan Multimedia Interaktif Berorientasi Pendekatan Kontekstual Materi Sumber Energi Pada Pembelajaran IPA Kelas IV SD. *Jurnal Edutech Undiksha*, *9*(1), 57–65. https://doi.org/10.23887/jeu.v9i1.32356.

Putri, E. F. (2021). Media Pembelajaran Powtoon untuk Meningkatkan Hasil Belajar Peserta Didik pada Mata Pelajaran Ekonomi. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *5*(2), 198–205. https://doi.org/10.23887/jppp.v5i2.34339.

Putri, F. A. B., & Rezkita, S. (2019). Pengembangan Media Pembelajaran Ipa Berbasis Powerpoint Interaktif

Untuk Siswa Kelas V Sekolah Dasar Negeri Gondolayu. *TRIHAYU: Jurnal Pendidikan Ke-SD-An*, *5*(3). https://doi.org/10.30738/trihayu.v5i3.6122.

Qosyim, A., & Priyonggo, F. V. (2018). Penerapan Media Pembelajaran Interaktif Menggunakan Flash Untuk Materi Sistem Gerak Pada Manusia Kelas VIII. *Jurnal Penelitian Pendidikan IPA*, *2*(2), 38. https://doi.org/10.26740/jppipa.v2n2.p38-44.

Rahayu, I. P., Christian Relmasira, S., & Asri Hardini, A. T. (2019). Penerapan Model Discovery Learning untuk Meningkatkan Keaktifan dan Hasil Belajar Tematik. *Journal of Education Action Research*, *3*(3), 193. https://doi.org/10.23887/jear.v3i3.17369.

Rahmi, M. S. M., Budiman, M. A., & Widyaningrum, A. (2019). Pengembangan Media Pembelajaran Interaktif Macromedia Flash 8 Pada Pembelajaran Tematik Tema Pengalamanku. *International Journal Of Elementary Education*, *3*(2), 178–185. https://doi.org/10.23887/ijee.v3i2.18524.

Saputra, I. M. P., & Putra, D. K. N. S. (2021). Pengembangan Media Pembelajaran Multimedia Interaktif dengan Model Hannafin and Peck pada Muatan IPA Kelas IV. *Mimbar Ilmu*, *26*(1), 88. https://doi.org/10.23887/mi.v26i1.32085.

Sari, N. M., Yetti, E., & Hapidin. (2020). Pengembangan Media Permainan Mipon's Daily untuk Meningkatkan Kemampuan Berhitung Anak. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *4*(2), 831. https://doi.org/10.31004/obsesi.v4i2.428.

Setiawan, D., Selvyana, K., Hidayat, A., & Rahmadani, N. K. A. (2022). Powerpoint Interaktif Materi Interaksi Manusia dengan Lingkungannya Kelas Sekolah Dasar. *Jurnal Basicedu*, *6*(1), 1201–1209. https://doi.org/10.31004/basicedu.v6i1.2183.

Suartama, I. K. (2016). *Evaluasi dan Kriteria Multimedia Pembelajaran*. Undiksha.

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Syavira, N. (2021). Pengembangan Media Pembelajaran Berbasis Powerpoint Interaktif Materi Sistem Pencernaan Manusia Untuk Siswa Kelas V Sd. *OPTIKA: Jurnal Pendidikan Fisika*, *5*(1), 84–93. https://doi.org/10.37478/optika.v5i1.1039.

Wardani, R. K., & Syofyan, H. (2018). Pengembangan Video Interaktif pada Pembelajaran IPA Tematik Integratif Materi Peredaran Darah Manusia. *Jurnal Ilmiah Sekolah Dasar*, *2*(4), 371. https://doi.org/10.23887/jisd.v2i4.16154.

Yamin, M. R., & Karmila, K. (2020). Analisis Kebutuhan Pengembangan Media Pembelajaran Berbasis Cartoon dalam Pembelajaran IPA pada Materi Lingkungan Kelas III SD. *Biology Teaching and Learning*, *2*(2), 159–170. https://doi.org/10.35580/btl.v2i2.12307.

Yanti, F., Yasmi, F., & Jaenam, J. (2014). Pengembangan Media Interaktif Berbasis Karakter Pada Materi Sistem Peredaran Darah Manusia Untuk Sma. *Jurnal Pelangi*, *7*(1), 126–136. https://doi.org/10.22202/jp.v7i1.194.

Yuniasih, N., Aini, R. N., & Widowati, R. (2018). Pengembangan Media Interaktif Berbasis Ispring Materi Sistem Pencernaan Manusia Kelas V Di SDN Ciptomulyo 3 Kota Malang. *Jurnal Inspirasi Pendidikan*, *8*(2), 85–94. https://doi.org/10.21067/jip.v8i2.2647.

Zahra, F., Wahyudiana, E., & Hadi, W. (2021). Pengembangan Media Interaktif Powerpoint Berbasis Model Discovery Learning Pada Muatan Ipa Kelas Iv Sd. *OPTIKA: Jurnal Pendidikan Fisika*, *5*(2), 104–112. https://doi.org/10.37478/optika.v5i2.1058.

Zulhelmi, Adlim, & Mahidin. (2017). Pengaruh Media Pembelajaran Interaktif Terhadap Peningkatkan Keterampilan Berpikir Kritis Siswa. *Jurnal Pendidikan Sains Indonesia*, *5*(1), 72–80. http://www.jurnal.unsyiah.ac.id/JPSI/article/view/8414/6803.