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Learn Number Lines with Interactive Video Learning Media

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Abstrak

Penelitian ini dilatarbelakangi oleh kesulitan guru dalam melaksanakan pembelajaran online yang membuat siswa kurang antusias dan kurang mampu memahami materi dalam pembelajaran online, sehingga diperlukan pengembangan media video interaktif. Penelitian ini bertujuan untuk menghasilkan media video interaktif materi garis bilangan kelas tiga SD yang diuji validitasnya. Model pengembangan yang digunakan dalam penelitian ini adalah model ADDIE. Subjek dalam penelitian ini terdiri dari 1 orang guru dan 4 orang ahli dosis yang ahli di bidangnya sebagai ahli media dan ahli materi, serta 12 siswa yang terdiri dari 3 orang sebagai tes individu dan sembilan siswa sebagai tes kelompok kecil. Metode pengumpulan data dalam penelitian ini adalah metode angket dan wawancara. Data yang dihasilkan dalam penelitian ini bersifat kualitatif dan kuantitatif. Data yang diperoleh kemudian dianalisis menggunakan rumus mean untuk mengetahui rata-rata validasi media video interaktif. Pengembangan media video interaktif dinyatakan valid berdasarkan penilaian ahli media, ahli desain, ahli materi, siswa uji individu, dan siswa kelompok kecil dengan rentang rata-rata 4,01 < X 5, dengan kualifikasi "sangat baik". Dengan demikian, dapat dikatakan bahwa produk video interaktif dinyatakan valid dan layak digunakan dalam pembelajaran khususnya pada materi garis bilangan kelas III SD.

***Kata kunci*:** *Video Interaktif, Garis Bilangan, Matematika*

Abstract

This research is motivated by the difficulties of the teacher in implementing online learning, which makes students less enthusiastic and less able to understand the material in online learning, so the development of interactive video media is needed. This study aims to produce interactive video media for grade three elementary school number line materials tested for validity. The development model used in this study is the ADDIE model. The subjects in this study consisted of 1 teacher and four dose experts who were experts in their fields as media experts and material experts, and 12 students consisting of 3 people as individual tests and nine students as small group tests. The method of data collection in this study is the method of questionnaires and interviews. The data generated in this study are qualitative and quantitative. The data obtained were then analyzed using the mean formula to determine the average validation of interactive video media. The development of interactive video media was declared valid based on the assessments of media experts, design experts, material experts, individual test students, and small group students with an average range of 4.01 < X 5, with the qualification "very good." Thus, it can be indicated that the interactive video product is declared valid and suitable for use in learning, especially on the number line material for third grade of elementary school.

Keywords: Interactive Video, Number Lines, Mathematics

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1. INTRODUCTION

The COVID-19 pandemic has influenced all aspects of life in the world, including in Indonesia (Mansyur, 2020; Yunitasari & Hanifah, 2020). With the COVID-19 pandemic, the Indonesian government has taken firm steps by issuing a circular requiring all life activities to be limited (Chang et al., 2021; Hasrul, 2020). It also has an impact on the world of Indonesian education, which must be carried out on a limited basis which is carried out online following circulars no 4 Tahun 2020 regarding the policy of implementing education in the emergency period of the spread of the virus (Cahyani et al., 2020; Nafrin & Hudaidah, 2021). In general, online learning can be interpreted as a learning system with the help of technology and internet networks (Atiqoh, 2020; Singh & Thurman, 2019). With online learning during the COVID-19 pandemic, it is hoped that it will achieve the goal of providing quality education services that are massive and open (Sofyana & Rozaq, 2019; Susanty,

2020). Based on this, teachers have a very important role in implementing quality online learning. In addition, the teacher's role in online learning is that the teacher must be able to create both face-to-face and online learning that does not make students bored participating in learning (Nafrin & Hudaidah, 2021; Winarsieh & Rizqiayah, 2020). One way to make students not bored with participating in online learning is to plan online learning using learning media (Hanik, 2020; Huzaimah & Risma, 2021). Learning media is a tool, object, and others that can support or assist the implementation of learning (Sholihin et al., 2020; Yanto, 2019). The learning media is expected to have a big impact on students so that they are motivated and can make it easier for them to understand the material (Bahasoan et al., 2020; Kuswanto & Radiansah, 2018). So learning media is very important learning.

But in reality, there are still difficulties experienced by teachers in carrying out various online learning (Pujiasih, 2020; Yuzulia, 2021). These problems are the lack of learning time, methods, communication, and learning media that are not good (Sadikin & Hamidah, 2020; Tarihoran & Cendana, 2020). It follows the results of observations that have been made where there are still obstacles to making online learning varied in carrying out online learning. In online learning, teachers only use learning media in the form of textbooks and practice questions that are sent to students. In the implementation of observations, it was also found that the teacher did not use interesting learning media in online learning. Based on this, there are still obstacles that will certainly impact students in implementing online learning. The impact on students from these problems is student learning outcomes that are less than optimal (Dewi et al., 2021; Saputra & Zinnurrain, 2018). It follows the results of observations that have been made where it can be seen that student learning outcomes have decreased due to the lack of variation in the learning process. In addition, other impacts of learning that are less varied and the absence of learning media in online learning are to make students unmotivated and feel bored. It follows the observation that students feel bored participating in online learning because they are only asked to read textbooks and work on questions the teacher gives without explaining the previous material. Based on this, it is necessary to solve these problems so that learning can be varied and students get a good learning experience.

Based on these problems, the solution that can be done is to plan varied learning (Indragani et al., 2021; Juningsih, 2020). One way to carry out varied learning is to use good learning media (Hakim, 2018; Wisnu Budi Wijaya, 2018). Good learning media that can be used in varied learning are learning media that have interactive, fun, challenging, and motivating aspects and provide space for students (Hakim, 2018; Nugroho & Surjono, 2019). In addition, the selection of media in varied online learning must pay attention to the type of media that can be used with technology and can be accessed properly by students (Nadhifa & Pujosusanto, 2021; Seruni et al., 2019). One type of learning media that can be used in online learning and has aspects of good learning media is interactive video learning media.

Interactive video is one of the learning media that can be used in the learning process that can be used to increase students' interest or enthusiasm (Assyifa et al., 2020; Prehanto et al., 2021). In general, an interactive video can be defined as a video that, in its presentation, displays a combination of photos, graphics, text, video, and sound to make learning interactive (Assyifa et al., 2020; Seckman, 2018). There have been many development studies regarding interactive videos. For example, previous studies state that interactive video media is appropriate for use in the learning process (Suseno et al., 2020). Other research also found that interactive video media was effective and could increase students' interest in learning (Warasasmita & Putra, 2017; Wardani & Syofyan, 2018). Based on this, it can be believed that the existence of learning video media will be able to answer the problems previously mentioned. In previous research, there are still weaknesses in the developed interactive video media. The weakness is that the material contained in the previous

interactive video research is still narrow, and there has been no development in the content of mathematics lessons, especially number line material. Based on this, interactive video media was developed by containing number line material in this development research. The number line material was chosen because there were problems from the teacher who had difficulty explaining the number line material, making it difficult for students to understand the material the teacher gave. Based on this, it is hoped that the development of material on the number line with interactive video media can provide teachers with a way to explain number line material so that students can understand the material better.

Based on what has been mentioned above, this research was conducted to develop interactive video media declared valid and suitable for learning. The level of validation of the developed media was tested by experts, teachers, and students. Research on the development of interactive video media can help teachers plan and compile and use learning media such as interactive videos to provide mathematics learning materials so that learning becomes more effective. In addition, this research is expected to make students happy to participate in learning because the media is interesting and fun.

2. METHODS

This research is a type of development research using the ADDIE development model. The ADDIE development model has five stages: the analysis stage, the design stage, the development stage, the implementation stage, and the evaluation stage (Ismail et al., 2018; Tegeh, 2017). The product produced in this research is interactive video media for third-grade elementary school number line material. This model was chosen because it has a systematic stage. The ADDIE development model is shown in Figure 1.

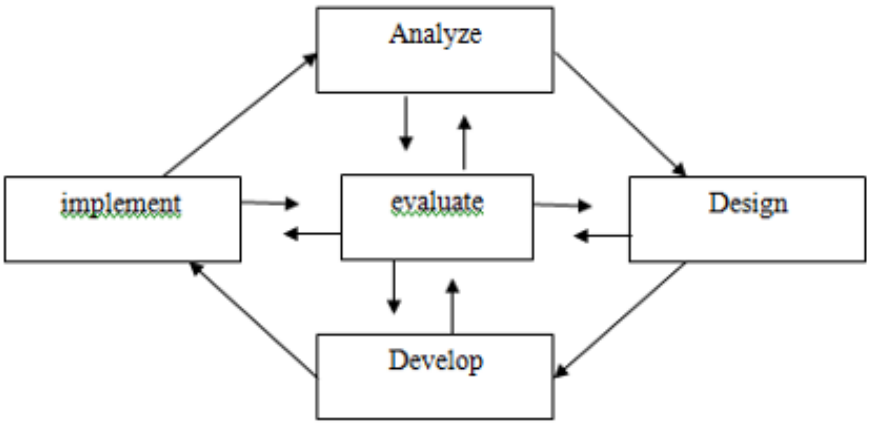

Figure 1. ADDIE Development Model

The subject of this research is interactive video media in learning mathematics on number line material. The object of research in this study is the validity of interactive video media in learning mathematics on number line material in the third grade of elementary school. The data collection method used to obtain data and information in this study is observation or observation and distributing questionnaires. The questionnaire is the method applied in this research. The questionnaire method is carried out by submitting a statement to the respondent. The data collection instrument used a rating scale instrument. The rating scale is raw data in the form of numbers and then interpreted into descriptive terms: weak-strong, positive-negative, and bad-good. The rating scale used on the rating scale is 1-5 (Agung, 2014; Ilhami & Rimantho, 2017). The rating scale is intended to collect data from media

validity results by experts. The arrangement of the media validity sheet validation instrument grid includes six aspects: the visual aspect consisting of media identity, color, writing, letters, and media layout and attractiveness. The audio aspect consists of rhythm and voice clarity. The typographic aspect consists of the suitability of the type of text. The language aspect consists of language use, standard, sentence effectiveness, and word use. Material aspects are related to the ability of the media to explain the material, the completeness of the material, and the attractiveness of the material in the media. Presentation aspects also relate to media use and appeal (Akbar & Tarman, 2018; Wuryanti & Kartowagiran, 2016). Validation sheets and interactive video media validation instruments are presented in Table 1, Table 2, Table 3, Table 4, and Table 5.

Table 1. Instrument Grid for Design Experts

No.	Aspect	Indicator
1	Media	The suitability of interactive videos with student characteristics
		The title match with interactive video
		Interactive video media targeting
		The clarity of the discussion presented.
2	Competence	Learning objectives already contain aspects of ABCD.
		The suitability of the learning objectives with the learning indicators
3	Method	Conformity of perception/illustration with the material
		Clarity of included cases/events
		The accuracy of the presentation of the material
4	Theory	Make it easier for students to understand the concept of learning.
		Increase students' attention to learning
		Interactive videos motivate students' interest in learning.
5	Evaluation	The suitability of the questions presented follows the material presented.

Table 2. Validation of Media Experts

No.	Aspect	Indicator
1	Visual	Image clarity
		Shooting suitability
		Color and background accuracy
		Interesting pictures and animations
		Image motion speed
		Lighting accuracy
2	Audio	Voice clarity
		Rhythm of sound
		Music compatibility
3	Typography	Text type selection
		Text size accuracy
4	Presentation	Have attraction
		Time duration
		Clarity of storyline

Table 3. Material Expert Instruments

No.	Aspect	Indicator
v1	Theory	Clarity of learning materials
		The suitability of interactive videos with learning objectives
		Compatibility of interactive videos with learning materials
		The accuracy of the distribution and coherence of the material
2	language	Language compatibility with Indonesian rules
		The sentences used are easy to understand
		The communicative nature of the language used.
		Language level with student's cognitive

Table 4. Video Instruments for Practitioners

No	Aspect	Indicator
1	Visual	Image clarity
		Shooting suitability
		Attractive colors, backgrounds, images, and animations
		Image motion speed
		Lighting accuracy
2	Audio	Voice clarity
		Rhythm of sound
		Music compatibility
3	Typography	Text type selection
		Text size accuracy
4	Theory	Clarity of learning materials
		The suitability of interactive videos with learning objectives
		The suitability of interactive videos with learning materials
		The accuracy of the distribution and coherence of the material
5	language	Language compatibility with Indonesian rules
		The sentences used are easy to understand and understand
		The communicative nature of the language used.
		Language level with student's cognitive
6	Cohesiveness	Have attraction
		Integration of visual aspects
		Compatibility of pictures and illustrations
		Time duration
		Clarity of storyline

Table 5. Instruments for Individual and Small Group Trial

No	Component	Indicator
1	Attract students	The attractiveness of the CD packaging (cover).
		The attractiveness of the learning video display.
		The attractiveness of the displayed image.
		The clarity and attractiveness of the colors presented.
2	Material presentation	The material presented is clear.
		The material presented is easy to understand
		The examples given in the material are easy to understand

No	Component	Indicator
3	Increase student attention	Interactive videos can increase attention.
4	Motivating	Interactive videos can motivate learning
5	Voice clarity	Narrator's voice clarity Music compatibility

The instrument was then tested for its content validity. Content validity is a requirement of the feasibility and quality of the instrument. Content validity is intended to determine the compiled instrument grid's validity level. For the compiled instrument to be said to be valid, a content validity test was carried out by several experts (judges) who have competence in the variables being studied. This validity test was carried out using the Gregory formula. Data analysis methods and techniques used in this study are descriptive qualitative and quantitative data analysis methods. The qualitative descriptive analysis method processes data in sentences, words, or categories regarding an object. The quantitative descriptive analysis method is a way of processing data in the form of numbers or percentages regarding the object under study. The score obtained from each criterion is then calculated on average to obtain the results of the validity of the media developed by applying the mean formula. The average score obtained is then converted using a five-scale conversion guideline to obtain media validity results. The five-scale assessment can be seen in Table 6.

Table 6. Five-scale rating

Score Range	Predicate
$4{,}01 < X \leq 5$	Very good
$3{,}34 < X \leq 4{,}01$	Good
$2{,}66 < X \leq 3{,}34$	Enough
$2{,}01 < X \leq 2{,}66$	Not good
$1 \leq X \leq 2{,}01$	Very Bad

3. RESULTS AND DISCUSSION

Results

The analysis phase is carried out by conducting needs, student characteristics, and curriculum analysis. At the needs analysis stage, it was found that the mathematics content material in the student books was still relatively narrow. In addition, media use in the learning process is still not optimal. Therefore, developing number line material through interactive video media is necessary. At the stage of student characteristics analysis, it is known that students are in the concrete operational stage. At this stage, students should learn to use concrete objects. Because using concrete objects can attract students' attention to take part in learning, it is suitable to develop interactive video media. At the curriculum analysis stage, it is known that basic competencies and indicators of competency achievement in class III number line material include explaining whole numbers and simple fractions as presented on the number line with indicators identifying whole numbers on the number line, using whole numbers and simple fractions as on the number line with indicators complete the addition of whole numbers using the number line. At the media analysis stage, it is known that the purpose of media development is to stimulate students to focus on lessons and to facilitate the learning process because the media can display real forms that can be seen and felt by students and as carriers of information containing instructional material.

The design stage is carried out by determining the material based on Basic Competencies and indicators of competency achievement, making storyboards, lesson plans, and media assessment instruments. Prepare storyboards based on material that has been prepared based on Basic Competencies and indicators of competency achievement. The purpose of compiling a storyboard is to make it easier to understand the flow of material that will be explained in the interactive video that will be developed. The lesson plan preparation at this stage aims to direct learning activities to students using interactive video media. At this stage, the preparation of media assessment instruments was also carried out, which was first tested for validity by two lecturers who were competent in their fields. The validity of the questionnaires tested were material experts, learning media experts, design experts, practitioner experts, individual trials, and small groups. This validity test was carried out using the Gregory formula. The results of the content validity that have been tested using the Gregory formula, namely the results of the material instrument's content validity, obtain a 1.00. The results of content validity of the media instrument obtained a result of 1.00. The results of content validity of the design instrument obtained a result of 1.00. The results of content validity of the practitioner's instrument obtained a result of 1.00. The content validity of the individual and small group test instruments obtained 1.00 results. Based on these results, the content validity test of the instrument in the range of 0.80-1.00 was declared valid with a very high level of content validity.

The development stage is carried out by making media based on the designs that have been made. The materials or materials used are obtained from third-grade mathematics textbooks and other relevant books. The learning video media consisted of 5 scenes: introduction, opening, learning materials, conclusions and examples of questions, and practice questions. The following displays the interactive video learning media that were developed. The results of developing interactive video media are shown in Figure 2.

Figure 2. Results of developing interactive video media

After the interactive video media has been created, further testing is carried out by experts, which aims to determine the level of validity of the products that have been developed. Experts carried out the validity test. These experts include two media or design experts, two material experts, one practitioner or teacher, three students as individual tests, and nine as small group tests. The results of the validation assessment of the interactive video media developed are presented in Table 7.

Table 7. Results of developing interactive video media

No	Respondent	Validation	Qualification
1	Learning Media Expert	4,75	Very good
2	Learning Design Expert	4,62	Very good
3	Learning Material Expert	4,62	Very good

No	Respondent	Validation	Qualification
4	Individual Test	4,63	Very good
5	Small Group Test	4,67	Very good

Discussion

This development research produces a product, namely interactive video media for number line material for third-grade elementary school students. The product is developed based on the ADDIE development model by following five stages: the analysis stage, the design stage, the development stage, the implementation stage, and the evaluation stage (Tegeh, 2017; Umami & Adha, 2021). This research only reached the development stage because the purpose of this study was only to find out the validity and feasibility of the developed media. The first stage is the analysis stage, which analyzes needs, student characteristics, and curriculum analysis. Based on the results obtained at the analysis stage, the problems found are that it is very necessary to have learning media to develop mathematical material that is still narrow. At this stage, it is also known that the characteristics of elementary school students are still at the concrete operational stage, so the media developed must be concrete. Based on this, the development of interactive video media is a good solution to developing mathematical material that is still narrow because interactive video media can explain abstract and concrete concepts. The results that have been obtained are then used as a reference in the process of developing interactive video media.

The next stage is the planning stage, designing and manufacturing the product. The product is developed with the help of storyboards to make interactive video media possible systematically. At the design stage, interactive video media is designed using animated images that can attract students' interest in learning. Media design is also done by adding cheerful genre music so that it can make students feel happy. With such a design, it is hoped that interactive video media can be a learning medium that can make learning interesting for students. Based on the results of the design stage, interactive video media products are assessed using an instrument that has been tested for the validity of its content. Based on the results obtained, the instrument used to assess interactive video media has been declared valid based on the results of the Gregory test. By using an instrument that has been declared valid, it can be believed that the assessment of interactive video media can be said to be even better.

The next stage is the development stage to determine the validation and feasibility of interactive video media developed by conducting a validation test using a valid instrument. Based on the results obtained, the product developed in this study has been declared valid based on the assessments of media experts, material experts, design experts, individual test students, and small groups. Based on these results, interactive video media for the third-grade elementary school material is suitable for learning, especially for the third-grade elementary school number line material. The feasibility of interactive video media for number line material for third-grade elementary school can be seen from two aspects: material and media. Interactive video media for number line material for third-grade elementary school is declared worthy of being seen from the aspect of the material presented in the developed interactive video media that has been explained clearly, attractively, and following the learning objectives. The learning objectives of interactive video media follow the basic competencies and indicators. The suitability of learning objectives with learning indicators so that the learning carried out follows the level of ability students must accept (Diniyah et al., 2018; Nisa, 2019). In addition, the language used in interactive video media follows students' characteristics. Using language following the characteristics of students will make it easier for students to understand the material presented (Ardina & Sa'dijah, 2016; Hidayat & Irawan, 2017).

The media aspect can also show the feasibility of interactive video media for number line material for third-grade elementary school. Developing interactive video media for number line material for third-grade elementary school is based on good media requirements, namely effective, efficient, and communicative. By developing learning media that adjusts to the requirements of good learning media, it will be able to categorize the developed learning media as good (Prasetyo, 2017; Shalikhah, 2017). In addition, in presenting material on interactive video media, number line material for third-grade elementary school is presented with videos, texts, animations, and pictures that are presented well so that it becomes more interesting and can foster learning motivation. By displaying animation in the learning process, it will give an interesting impression to students so that they can make learning active, creative, fun, and effective (Novita et al., 2019; Panjaitan et al., 2020). Interactive video media can give the impression of ideal, meaningful, and fun learning (Andrian, 2017; Gunawan, 2020).

Based on the research results obtained are relevant to the results of other studies that have been carried out. Previous research shows that interactive video media can improve student learning outcomes (Gunawan, 2020). Other studies have also found that interactive video media is effective in learning and can attract students' interest in learning to have implications for increasing student learning outcomes (Dwiqi et al., 2020). Another study stated that the interactive video media that was developed was declared to be effective in learning so that it could increase students' learning motivation, make it easier for students to understand the content of the lesson, and can help teachers in carrying out learning (Prabawa & Restami, 2020). Based on what has been conveyed above, it can be believed that the learning video media that has been developed is declared suitable for online learning, especially the third-grade elementary school number line material. In this regard, it can be seen that interactive video media has many advantages. The advantage of interactive media developed is that using interactive video media can present an interesting learning atmosphere and make students active in participating in learning so that it can make it easier for students to follow learning. Using videos will make it easier for students to understand the material because it can be delivered directly, and students can replay it so that the material is understood more clearly by students (Delil, 2017; Xu & Zhou, 2020).

This development research implies that students can use this media to help and make it easier to understand the material, especially the number line material in learning mathematics. In addition, this research implies that teachers are helped in explaining material to students, especially number line material, and solving problems experienced by teachers in online learning. With this research, it is hoped that it will become one of the options in helping implement the learning process in schools. This research is far from perfect because it is still limited to developing interactive video media on number line material, so there is hope that there will be other research that can develop interactive video media with a wider scope of material.

4. CONCLUSION

Based on the results obtained and the discussion, it can be concluded that the product produced in this study is an interactive video media that has been declared valid based on the results of assessments from material experts, media experts, design experts, and individual and small group test students. Thus, it can be believed that the learning video media that has been developed is declared suitable for online learning, especially the third-grade elementary school number line material.

5. REFERENCES

Agung, A. A. G. (2014). *Metodologi Penelitian Pendidikan*. Deepublish.

Akbar, A. A., & Tarman, T. (2018). Pengaruh Penggunaan Media Gambar Terhadap Hasil Belajar Bahasa Indonesia Pada Siswa Kelas Iv Sekolah Dasar. *JRPD (Jurnal Riset Pendidikan Dasar)*, *1*(1), 40–48. https://doi.org/10.26618/jrpd.v1i1.1238.

Andrian, R. (2017). Pembelajaran Bermakna Berbasis Post It. Jurnal Mudarrisuna. *Jurnal Mudarrisuna*, *7*(1), 103–118. https://doi.org/https://doi.org/http://dx.doi.org/10.22373/jm.v7i1.1911.

Ardina, F. R., & Sa'dijah, C. (2016). Analisis Lembar Kerja Siswa Dalam Meningkatkan Komunikasi Matematis Tulis Siswa. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *1*(2), 171–180. https://doi.org/http://dx.doi.org/10.17977/jp.v1i2.6119.

Assyifa, F. N., Rohita, & Nurfadilah. (2020). Pengaruh Video Pembelajaran Interaktif Mengenal Warna Terhadap Kemampuan Kognitif Anak. *JIV-Jurnal Ilmiah Visi*, *15*(2), 137–146. https://doi.org/10.21009/jiv.1502.5.

Atiqoh, L. N. (2020). Respon Orang Tua Terhadap Pembelajaran Daring Pada Masa Pandemi Covid-19. *Thufuli : Jurnal Ilmiah Pendidikan Islam Anak Usia Dini*, *2*(1), 45. https://doi.org/10.33474/thufuli.v2i1.6925.

Bahasoan, A. N., Wulan Ayuandiani, Muhammad Mukhram, & Aswar Rahmat. (2020). Effectiveness of Online Learning In Pandemic Covid-19. *International Journal of Science, Technology & Management*, *1*(2), 100–106. https://doi.org/10.46729/ijstm.v1i2.30.

Cahyani, A., Listiana, I. D., & Larasati, S. P. D. (2020). Motivasi Belajar Siswa SMA pada Pembelajaran Daring di Masa Pandemi Covid-19. *IQ (Ilmu Al-Qur'an): Jurnal Pendidikan Islam*, *3*(01), 123–140. https://doi.org/10.37542/iq.v3i01.57.

Chang, T.-Y., Hsu, M.-L., Kwon, J.-S., Kusdhany, M. L. S., & Hong, G. (2021). Effect of online learning for dental education in asia during the pandemic of COVID-19. *Journal of Dental Sciences*. https://doi.org/10.1016/j.jds.2021.06.006.

Delil, S. (2017). The impact of infographic animation videos on data visualization. *International Journal of Social Sciences and Education Research*, *3*(4), 1178–1183. https://doi.org/10.24289/ijsser.312933.

Dewi, R. R., Suresman, E., & Suabuana, C. (2021). Pendidikan Kewarganegaraan Sebagai Pendidikan Karakter di Persekolahan. *ASANKA: Journal of Social Science And Education*, *2*(1), 71–84. https://doi.org/10.21154/asanka.v2i1.2465.

Diniyah, A. N., Akbar, P., Nurjaman, A., & Bernard, M. (2018). Analisis Kemampuan Kemampuan Penalaran Dan Self Confidence Siswa Sma Dalam Materi Peluang. *Journal On Education*, *1*(1), 14–21. https://doi.org/10.31004/joe.v1i1.5.

Dwiqi, G. C. S., Sudatha, I. G. W., & Sukmana, A. I. W. I. Y. (2020). Pengembangan Multimedia Pembelajaran Interaktif Mata Pelajaran IPA Untuk Siswa SD Kelas V. *Jurnal Edutech Undiksha*, *8*(2), 33. https://doi.org/10.23887/jeu.v8i2.28934.

Gunawan, D. (2020). Pengaruh Media Video Interaktif Terhadap Hasil Belajar Kognitif Kelasa Iv Sd Negeri 2 Karangrejo Trenggalek. *EDUPROXIMA : Jurnal Ilmiah Pendidikan IPA*, *2*(1), 1–9. https://doi.org/10.29100/eduproxima.v2i1.1489.

Hakim, L. (2018). Pengembangan Media Pembelajaran Pai Berbasis Augmented Reality. *Lentera Pendidikan : Jurnal Ilmu Tarbiyah Dan Keguruan*, *21*(1), 59–72. https://doi.org/10.24252/lp.2018v21n1i6.

Hanik, E. U. (2020). Self Directed Learning Berbasis Literasi Digital Pada Masa Pandemi Covid-19 di Madrasah Ibtidaiyah. *Elementary: Islamic Teacher Journal*, *8*(1), 183–208. https://doi.org/10.21043/elementary.v8i1.7417.

Hasrul, M. (2020). Aspek Hukum Pemberlakuan Pembatasan Sosial Berskala Besar (PSBB) Dalam Rangka Penanganan Corona Virus Disease 2019 (COVID-19). *LEGISLATIF: Lembaga Gagasan Mahasiswa Yang Solutif Dan Inovatif*, *3*(2), 385–398. https://doi.org/10.20956/jl.v3i2.10477.

Hidayat, A., & Irawan, I. (2017). Pengembangan Lks Berbasis Rme Dengan Pendekatan Problem Solving Untuk Memfasilitasi Kemampuan Pemecahan Masalah Matematis Siswa. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *1*(2), 51–63. https://doi.org/10.31004/cendekia.v1i2.20.

Huzaimah, P. Z., & Risma, A. (2021). Hambatan yang Dialami Siswa Dalam Pembelajaran Daring Matematika Pada Masa Pandemi COVID-19. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *05*(01), 533–541. https://j-cup.org/index.php/cendekia/article/view/537.

Ilhami, R. S., & Rimantho, D. (2017). Penilaian Kinerja Karyawan dengan Metode AHP dan Rating Scale. *Jurnal Optimasi Sistem Industri*, *16*(2), 150. https://doi.org/10.25077/josi.v16.n2.p150-157.2017.

Indragani, K. D. P., Astika, I. M., & Tantri, A. A. S. (2021). Variasi Mengajar Guru dalam Pembelajaran Daring. *Jurnal Pendidikan Bahasa Dan Sastra Indonesia Undiksha*, *11*(4), 482. https://doi.org/10.23887/jjpbs.v11i4.39865.

Ismail, M. E., Utami, P., Ismail, I. M., Hamzah, N., & Harun, H. (2018). Development of massive open online course (MOOC) based on addie model for catering courses. *Jurnal Pendidikan Vokasi*, *8*(2), 184. https://doi.org/10.21831/jpv.v8i2.19828.

Juningsih. (2020). Metode Bervariasi dan Media Nyata dalam Meningkatkan Pemahaman Peserta Didik Materi Tumbuhan Berdasarkan Bentuk Daun. *Jurnal Ilmu Pendidikan (JIP)*, *1*(2), 125–132. https://www.jurnal-lp2m.umnaw.ac.id/index.php/JIP/article/view/568.

Kuswanto, J., & Radiansah, F. (2018). Media Pembelajaran Berbasis Android Pada Mata Pelajaran Sistem Operasi Jaringan Kelas XI. *Jurnal Media Infotama*, *14*(1). https://doi.org/10.37676/jmi.v14i1.467.

Mansyur, A. R. (2020). Dampak COVID-19 Terhadap Dinamika Pembelajaran Di Indonesia. *Education and Learning Journal*, *1*(2), 113. https://doi.org/10.33096/eljour.v1i2.55.

Nadhifa, N. A., & Pujosusanto, A. (2021). Game Belajar Bahasa Jerman LUVLINGUA Sebagai Media Pembelajaran Bahasa Jerman Keterampilan Menyimak Peserta Didik SMA Kelas XI. *E-Jurnal UNESA*, *10*(2). https://doi.org/ejournal.unesa.ac.id/index.php/laterne/article/view/40326.

Nafrin, I. A., & Hudaidah, H. (2021). Perkembangan Pendidikan Indonesia di Masa Pandemi Covid-19. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(2), 456–462. https://doi.org/10.31004/edukatif.v3i2.324.

Nisa, A. L. (2019). Analisis Kemampuan Abstraksi Matematis Siswa Dalam Menyelesaikan Soal Pada Materi Segiempat Kelas Vii Smp. *JPM : Jurnal Pendidikan Matematika*, *4*(1), 01. https://doi.org/10.33474/jpm.v4i1.2610.

Novita, L., Sukmanasa, E., & Pratama, M. Y. (2019). Penggunaan Media Pembelajaran Video terhadap Hasil Belajar Siswa SD. *Indonesian Journal of Primary Education Penggunaan*, *3*(2), 64–72. https://repository.unpak.ac.id/tukangna/repo/file/files-20200110015955.pdf.

Nugroho, I. A., & Surjono, H. D. (2019). Pengembangan multimedia pembelajaran interaktif berbasis video materi sikap cinta tanah air dan peduli lingkungan. *Jurnal Inovasi Teknologi Pendidikan*. https://doi.org/10.21831/jitp.v6i1.15911.

Panjaitan, N. Q., Yetti, E., & Nurani, Y. (2020). Pengaruh Media Pembelajaran Digital Animasi dan Kepercayaan Diri terhadap Hasil Belajar Pendidikan Agama Islam Anak.

Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini, *4*(2), 588. https://doi.org/10.31004/obsesi.v4i2.404.

Prabawa, D. G. A. P., & Restami, M. P. (2020). Pengembangan Multimedia Tematik Berpendekatan Saintifik untuk Siswa Sekolah Dasar. *Mimbar PGSD Undikhsa*, *8*(3), 479–491. https://doi.org/10.23887/jjpgsd.v8i3.28970.

Prasetyo, S. (2017). Pengembangan Media Pembelajaran Ipa Berbasis Android Untuk Siswa Sd/Mi. *JMIE (Journal of Madrasah Ibtidaiyah Education)*, *1*(1), 122–141. https://doi.org/10.32934/jmie.v1i1.29.

Prehanto, A., Aprily, N. M., Merliana, A., & Nurhazanah, M. (2021). Video Pembelajaran Interaktif-Animatif sebagai Media Pembelajaran IPS SD Kelas Tinggi di Masa Pandemi Covid 19. *Indonesian Journal of Primary Education*, *5*(1), 32–38. https://doi.org/https://doi.org/10.17509/ijpe.v5i1.33696.

Pujiasih, E. (2020). Membangun Generasi Emas dengan variasi Pembelajaran Online di Masa Pandemi Covid-19. *Ideguru: Jurnal Karya Ilmiah Guru*, *5*(1), 42–48. https://doi.org/10.51169/ideguru.v5i1.136.

Sadikin, A., & Hamidah, A. (2020). Pembelajaran Daring di Tengah Wabah Covid-19. *Biodik*, *6*(2), 109–119. https://doi.org/10.22437/bio.v6i2.9759.

Saputra, H. G., & Zinnurrain. (2018). Pengaruh Penggunaan Media Ms Powerpoint Berbasis Game Terhadap Hasil Belajar Siswa. *Jurnal Teknologi Pendidikan: Jurnal Penelitian Dan Pengembangan Pembelajaran*, *3*(1), 11–19. https://doi.org/https://doi.org/10.33394/jtp.v3i1.1222.

Seckman, C. (2018). Impact of Interactive Video Communication Versus Text-Based Feedback on Teaching, Social, and Cognitive Presence in Online Learning Communities. *Nurse Educator*, *43*(1), 18–22. https://doi.org/10.1097/NNE.0000000000000448.

Seruni, R., Munawaoh, S., Kurniadewi, F., & Nurjayadi, M. (2019). Pengembangan Modul Elektronik (E-Module) Biokimia Pada Materi Metabolisme Lipid Menggunakan Flip Pdf Professional. *JTK (Jurnal Tadris Kimiya)*, *4*(1), 48–56. https://doi.org/10.15575/jtk.v4i1.4672.

Shalikhah, N. D. (2017). Media Pembelajaran Interaktif Lectora Inspire sebagai Inovasi Pembelajaran. *Warta LPM*, *20*(1), 9–16. https://doi.org/10.23917/warta.v19i3.2842.

Sholihin, M., Sari, R. C., Yuniarti, N., & Ilyana, S. (2020). A new way of teaching business ethics: The evaluation of virtual reality-based learning media. *International Journal of Management Education*, *18*(3), 100428. https://doi.org/10.1016/j.ijme.2020.100428.

Singh, V., & Thurman, A. (2019). How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018). *American Journal of Distance Education*, *33*(4), 289–306. https://doi.org/10.1080/08923647.2019.1663082.

Sofyana, L., & Rozaq, A. (2019). Pembelajaran Daring Kombinasi Berbasis Whatsapp Pada Kelas Karyawan Prodi Teknik Informatika Universitas PGRI Madiun. *JANAPATI: Jurnal Nasional Pendidikan Teknik Informatika*, *8*(1), 81–86. https://doi.org/http://dx.doi.org/10.23887/janapati.v8i1.17204.

Susanty, S. (2020). Inovasi Pembelajaran Daring Dalam Merdeka Belajar. *Jurnal Ilmiah Hospitality*, *9*(2), 157–166. https://doi.org/10.47492/jih.v9i2.289.

Suseno, P. U., Ismail, Y., & Ismail, S. (2020). Pengembangan Media Pembelajaran Matematika Video Interaktif berbasis Multimedia. *Jambura Journal of Mathematics Education*, *1*(2), 59–74. https://doi.org/10.34312/jmathedu.v1i2.7272.

Tarihoran, N. M., & Cendana, W. (2020). Upaya Guru dalam Adaptasi Manajemen Kelas untuk Efektivitas Pembelajaran Daring. *Jurnal Persada*, *III*(3), 134–140. https://doi.org/https://doi.org/10.37150/perseda.v3i3.1010.

Tegeh, I. M. dan I. N. J. (2017). *Metode Penelitian Pengembangan*. FIP Undiksha.

Umami, N., & Adha, M. I. N. (2021). Pengembangan Media Pembelajaran Games Book Accounting Untuk Meningkatkan Motivasi Mata Pelajaran Akuntansi Dasar Materi Siklus Akuntansi. *Jurnal Pendidikan Ekonomi*, *14*(1), 15–24. https://doi.org/10.17977/UM014v14i12020p15.

Warasasmita, R. H., & Putra, Y. K. (2017). Pengembangan Media Pembelajaran Video Tutorial Interaktif Menggunakan Aplikasi Camtasia Studio dan Micromedia Flash. *EDUMATIC: Jurnal Pendidikan Informatika*, *1*(2), 35–43. https://doi.org/10.29408/edumatic.v1i2.944.

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.

Winarsieh, I., & Rizqiayah, I. P. (2020). Peranan Guru Dalam Pembelajaran Daring Pada Masa Pandemi COVID-19. *Journal of Chemical Information and Modeling*, *1*(4), 159–164. https://journal.publication-center.com/index.php/ijte/article/view/212.

Wisnu Budi Wijaya, I. K. (2018). Mengembangkan Kecerdasan Majemuk Siswa Sekolah Dasar (SD) Melalui Pembelajaran IPA Untuk Meningkatkan Mutu Lulusan Sekolah Dasar. *Jurnal Penjaminan Mutu*, *4*(2), 147. https://doi.org/10.25078/jpm.v4i2.568.

Wuryanti, U., & Kartowagiran, B. (2016). Pengembangan Media Video Animasi Untuk Meningkatkan Motivasi Belajar Dan Karakter Kerja Keras Siswa Sekolah Dasar. *Jurnal Pendidikan Karakter*, *6*(2), 232–245. https://doi.org/10.21831/jpk.v6i2.12055.

Xu, W., & Zhou, Y. (2020). Course video recommendation with multimodal information in online learning platforms: A deep learning framework. *British Journal of Educational Technology*, *51*(5), 1734–1747. https://doi.org/10.1111/bjet.12951.

Yanto, D. T. P. (2019). Praktikalitas Media Pembelajaran Interaktif pada Proses Pembelajaran Rangkaian Listrik. *INVOTEK: Jurnal Inovasi Vokasional Dan Teknologi*, *19*(1), 75–82. https://doi.org/10.24036/invotek.v19i1.409.

Yunitasari, R., & Hanifah, U. (2020). Pengaruh Pembelajaran Daring terhadap Minat Belajar Siswa pada Masa COVID 19. *Edukatif : Jurnal Ilmu Pendidikan*, *2*(3), 232–243. https://doi.org/10.31004/edukatif.v2i3.142.

Yuzulia, I. (2021). The Challenges of Online Learning during Pandemic: Students' Voice. *Jurnal Pendidikan Dan Pengajaran*, *13*(1), 08–12. https://doi.org/10.31294/w.v13i1.9759.