Interactive Powerpoint Learning Media on Science Content for Fifth Grade Elementary School

Kadek Panji Yustisio[1]*, I Komang Sudarma[2] , Gede Wira Bayu[3] (iD)

[1,3] Pendidikan Guru Sekolah Dasar, Universitas Pendidikan Ganesha, Singaraja, Indonesia
[2] Teknologi Pendidikan, Universitas Pendidikan Ganesha, Singaraja, Indonesia

A B S T R A K

Guru yang kurang mengemas model pembelajaran dan media yang sesuai untuk pembelajaran IPA sehingga siswa merasa kesulitan dalam belajar. Tujuan penelitian ini yaitu mengembangkan video berbasis PBL. Jenis penelitian ini yaitu pengembangan dengan menggunakan model ADDIE. Subjek penelitian yaitu 1 ahli isi, 1 ahli desain pembelajaran, dan 1 ahli media pembelajaran. Subjek uji coba yaitu siswa kelas V yang berjumlah 3 orang untuk uji coba perorangan, 9 orang uji coba kelompok kecil, dan 27 orang untuk uji coba lapangan. Metode pengumpulan data menggunakan kusioner atau angket. Instrumen pengumpulan data menggunakan instrumen rating scale. Teknik analisis data yaitu teknik analisis statistik deskriptif kualitatif dan analisis statistik deskriptif kuantitatif dan statistic inferensial. Hasil analisis yaitu validasi ahli media diperoleh presentase sebesar 93,33% (sangat baik), ahli materi 98,68% (sangat baik), dan ahli desain 89,70% (sangat baik). Hasil uji perorangan diperoleh 93,33% (sangat baik), uji coba kelompok kecil yaitu 95% (sangat baik) dan uji lapangan 94,35%. Berdasarkan hasil analisis, menunjukkan besar signifikansi lebih kecil dari 0,05 (p<0,05). Dengan demikian maka dapat dketahui bahwa terdapat perbedaan yang signifikan hasil belajar siswa muatan IPA antara sebelum menggunakan video pembelajaran berbasis PBL. Disimpulkan video pembelajaran berbasis PBL meningkatkan hasil belajar siswa.

A B S T R A C T

Teachers who do not package appropriate learning models and media for science learning so that students find it challenging to learn. This study aimed to develop a PBL-based video. This type of research is developed using the ADDIE model. The research subjects were one content expert, one learning design expert, and one learning media expert. The test subjects were 3rd-grade students for individual trials, nine small group trials, and 27 people for field trials. Methods of data collection using questionnaires or questionnaires. The data collection instrument used a rating scale instrument. Data analysis techniques are qualitative descriptive statistical analysis, quantitative descriptive statistical analysis, and inferential statistics. The results of the analysis, namely the validation of media experts, obtained a percentage of 93.33% (very good), material experts 98.68% (very good), and design experts 89.70% (very good). The individual test results were 93.33% (very good), the small group trial was 95% (very good), and the field test was 94.35%. Based on the results of the analysis shows that the significance level is less than 0.05 (p<0.05). Thus, it can be seen that there is a significant difference in student learning outcomes for science content before using PBL-based learning videos. It is concluded that PBL-based learning videos improve student learning outcomes.

1. INTRODUCTION

Currently, the world is in shock with the covid-19 virus outbreak, which can cause death, so one must be aware of this virus. This very dangerous Coronavirus has an impact on all community activities (Lyócsa et al., 2020; Shah et al., 2020). Covid-19 also affects all aspects of human life, especially education (Batubara & Batubara, 2020; Yulia, 2020). It has caused the government to make new regulations, namely that everyone does not do activities outside or inside the house in groups to reduce the spread of COVID-19. In addition, learning activities must also be carried out at home so that students are not infected with this disease (Kadafi et al., 2021; Tamboto et al., 2021). It causes learning activities to be carried out online.

 Corresponding author
*E-mail addresses: panjiyustisio123@gmail.com (Kadek Panji Yustisio)

Learning activities must continue to be carried out so that the quality of human resources is maintained properly (Ahmad & Triastuti, 2021; Dewantara & Nurgiansah, 2020). Superior human resources are one of the requirements to build the Indonesian nation to be more advanced. If the Indonesian nation already has superior human resources, it can advance the Indonesian nation quickly (Hidayah et al., 2020; Syarifudin, 2020). An appropriate learning approach is needed for students in thematic learning to achieve maximum learning objectives.

Thematic learning involves several fields of study that aim to provide meaningful experiences for students because they relate to a theme (Pratama et al., 2020; Suryaningsih & Rimpiati, 2018). Learning with real themes invites students to understand the concepts learned through direct experience and connect concepts they have understood (Desyandri et al., 2019; Wuryani & Yamtinah, 2018). This thematic learning is one of the integrated learning that provides meaningful experiences to students to create a learning environment that encourages full student involvement in learning (Dewi & Rukmini, 2019; Laksana et al., 2019). Thematic learning also requires students to be active in learning and able to solve a problem according to their abilities. In learning activities, students can do learning by playing. It can lead to high creativity so that students can integrate their knowledge and skills using the theme (Haifaturrahmah et al., 2020; Syaifuddin, 2017). One of the contents contained in the theme is learning science. Science in elementary schools can be a vehicle for students to study nature and apply it in students' lives (Diartha et al., 2019; Stiawan et al., 2017). In science learning activities, students focus more so that learning activities become more active and fun (Hairida, 2016; Nanda et al., 2017). It causes science learning to be packaged properly with an appropriate learning approach so that it can help students understand learning to the fullest.

However, in reality, many teachers do not package appropriate learning models for science learning, so students find it difficult to learn (Anif et al., 2020; Kusumayuni & Agung, 2021). Some students do not like science learning because students feel bored with the learning model used by the teacher (Arisantiani et al., 2017; Suantara et al., 2019). Learning activities with teacher-centered science learning lead to less than optimal learning outcomes obtained by students (Wardani & Syofyan, 2018; Widiartini et al., 2019). Based on observations made in the fifth grade of SD N 5 Patemon, problems were found in theme 7 sub-theme 1: learning activities are not associated with daily life, so students have difficulty understanding learning materials. In addition, learning activities are also still teacher-centered, causing students' low thinking and learning objectives not to be achieved optimally. In the 2013 curriculum, learning activities require students to be active in learning so that an appropriate learning process occurs. If learning is teacher-centered, students only passively listen to the teacher's explanations, and students' thinking skills become less developed. In addition, the lack of interaction between teachers and students resulted in a less effective learning atmosphere. The lack of learning media is also the main cause of students' difficulties in learning science, resulting in learning outcomes below the Minimum Completeness Criteria. The data analysis showed that of the 27 total students, seven were completed (20%) while 20 had not completed (80%). If these problems are left unchecked, they will harm student learning outcomes.

The solution to these problems is using learning media based on an appropriate learning approach for students. One of the suitable media for science learning is a problem-based learning video. PBL-based video is very suitable because it is flexible and easy to use. The use of video media will attract attention so that it can support a fun learning process (Hikmah & Purnamasari, 2017; Maryanti & Kurniawan, 2018). This video can also improve critical thinking in students because it is PBL based. PBL is a learning approach that exposes students to real problems to help them better analyze a problem (Nurtanto et al., 2019; Zhou, 2018). This learning activity can make students more active in learning because it can stimulate critical thinking skills so students can solve problems correctly (Ballesteros et al., 2019; Primayanti et al., 2019). The problems presented in this video are in digital format so that the problems presented can be accessed anywhere. Video media has a function that can direct and help concentration when participating in learning activities (Priantini, 2020; Putri et al., 2020). Videos can also accelerate the achievement of learning goals because students can easily remember the message conveyed in the video (Lukman et al., 2019; Muliani & Wibawa, 2019). In addition, another benefit of video is that it helps you visualize the meaning of the message more clearly to allow maximum student mastery (Kurniawan et al., 2018; Widiyasanti et al., 2018). Using media and selecting appropriate models can help students who do not understand the material easier to learn.

The findings of previous research stated that video was very suitable to be used because it follows students' character so that they were very interested in participating in learning activities (Nanda et al., 2017; Putri et al., 2020). Other research findings also state that videos presented in colors that are liked by students and interesting can increase students' motivation (Ponza et al., 2018; Widiarti et al., 2021). Other findings also state that the PBL-based learning approach can improve students' critical thinking (Argaw et al., 2017; Ariswati et al., 2018; Fitriyanti et al., 2020). There is no study on PBL-based videos on theme 7 for

fifth grade. The advantages of learning videos that will be developed are that these videos will present appropriate material and animations that can stimulate students in learning. It is what causes videos to help students who are slow in capturing messages become easier to accept the information conveyed by the teacher. In addition, this video can also train students to solve problems so that they can improve their critical thinking in students. This study aims to develop a PBL-based video on Theme 7 for fifth-grade elementary school. It is hoped that PBL-based videos will help students learn.

2. METHOD

This research uses the ADDIE model, including analysis, design, development, implementation, and evaluation (Tambunan & Sundari, 2020). The analysis phase is problem analysis. The design stage is done by designing the media. The development stage is carried out to develop PBL-based videos. The implementation phase is used for product testing on students. The evaluation stage is to test the effectiveness of the PBL-based video. The research subjects are one content expert, one learning design expert, and one learning media expert. The trial subjects were fifth-grade students, totaling 3 for individual trials, 9 for small group trials, and 27 for field trials at SD Negeri 5 Patemon. The data collection method in this study used a questionnaire or questionnaire. Questionnaires are used to collect data in the form of input or scores from experts. The data collection instrument in this development research used a rating scale instrument. The instrument grid is presented in Table 1 and Table 2.

Table 1. Material Expert Instruments

Aspect	Indicator
Kurikulum	The suitability of indicators with Basic Competencies, Objectives with indicators, and materials with objectives
Contents	The breadth and depth of the material
	The suitability of the material with the characteristics of students
	Material Interest
	Precise examples to explain
	The suitability of the questions given
	The adequacy of the examples given
	The suitability of images, videos, and animations to clarify the content
Language	Conformity with the rules of the Indonesian language
	The language used follows the characteristics of students.
	Spelling accuracy on the material
	Use language effectively and efficiently.
Evaluation	Clarity of problem formulation and level of difficulty of questions following competence

(Candra Dewi & Negara, 2021)

Table 2. Media Expert Instruments

Aspect	Indicator
Cover	The cover design is attractively made.
	The letters used on the cover are attractive and easy to read.
	The cover illustration describes the contents/materials of teaching materials.
	The font size for the title of teaching materials is more dominant and proportional than other font sizes.
	Title color match
Audio	The narrator's voice is clear.
	Music compatibility in video
	Effect suitability on video
	intonation match
	Size, Sharpness, Exposure of images and animations
	Clear font display
	Layout/appearance of images, videos, and animations that are presented proportionally
	Interesting video images and animations

(Candra Dewi & Negara, 2021)

The data analysis techniques used in this development research are qualitative descriptive

statistical analysis, quantitative descriptive statistical analysis, and inferential statistics. This study used qualitative techniques to process data in the form of criticism, suggestions/input, and responses to the results of expert reviews regarding the developed video media. Quantitative techniques describe the average score of each expert regarding the developed learning video media. To make decisions about the meaning of the material, design, media, and student expert test validation instruments, use the five-scale achievement convention (Tegeh, I. M., & Kirna, 2013). The inferential statistical analysis technique was used to determine product effectiveness on student learning outcomes at SD Negeri 5 Patemon before and after using the product development of learning video media.

3. RESULT AND DISCUSSION

Result

This development research produces media products in the form of problem-based learning-based learning videos on theme 7, especially on science content carried out in fifth grade at SD Negeri 5 Patemon using ADDIE. First, analysis. The analysis results are on theme 7 sub-theme 1, namely that learning activities are not associated with daily life, so students have difficulty understanding the learning material. In addition, learning activities are also still teacher-centered, causing students' low thinking and learning objectives not to be achieved optimally. In the 2013 curriculum, learning activities require students to be active in learning so that an appropriate learning process occurs. If learning is teacher-centered, students only passively listen to the teacher's explanations, and students' thinking skills become less developed. In addition, the lack of interaction between teachers and students resulted in a less effective learning atmosphere. The results of the curriculum analysis, namely Basic Competencies and indicators, are presented in Table 3.

Table 3. Basic Competencies and Indicators

Basic Competencies	Indicators
3.7 Analyze the effect of heat on changes in temperature and the shape of objects in everyday life	3.7.1 Analyzing the properties of gaseous objects.
	3.7.2 Analyze yawning events.
	3.7.3 Analyzing condensation events
	3.7.4 Analyzing Changes in the Form of Gases
	3.7.5 Analyzing Freeze Events
	3.7.6 Analyzing Melting Events
	3.7.7 analyzing events requiring and releasing heat

Second, design. The stage of collecting materials is needed to complete and support the content and appearance of the learning video media. The materials collected were in the form of material on theme 7 (Events in Life) on the science content sourced from student books and using animation to convey the contents of the learning video. The problem-based learning video media framework is carried out systematically in compiling materials, animations, pictures, and characters in the learning practice videos. The results of the video design are presented in Figure 1.

Figure 1. PBL-based Video Design

Third, development. The next stage is the development stage, where the problem-based learning video media is developed into a real product adapted to the design that was made previously. The initial activity carried out at this stage is to collect materials or materials, material that is following the research made where the material will be sought or consulted to the school concerned, each material presented in each video consists of several basic competencies. The contents of problem-based learning-based learning

videos are material summaries, animations, pictures, and practice videos. The cover video was made using the Wobdershare Filmora X application in making the cover adapted to the fifth grade 7 theme of SD Negeri 5 Patemon and the material from theme 7 specifically on science content. The cover was made as attractive as possible, which aims to attract the attention of potential viewers or students. The results of the development are presented in Figure 2.

Figure 2. PBL-based video

PBL-based videos are then validated. The results of the validation of media experts obtained a percentage of 93.33% (very good), material experts 98.68% (very good), and design experts 89.70% (very good). Fourth is implementation. The individual test obtained 93.33% (very good), a small group trial that was 95% (very good), and a field test of 94.35%. It is concluded that PBL-based video is valid, so it is feasible to be applied in learning. The results of the expert validation got good qualifications, and the Indonesian word replaced some input from experts, namely the foreign word effort. In the explanation, there were no images of sea breezes in the convection section. The results of the revision are presented in Figure 3.

Figure 3. Results of PBL-based Video Revision

Fifth is evaluation. At the evaluation stage, it is carried out to determine the results of the prerequisite test. The prerequisite test includes the normality test and the sample T-test, which aims to determine the results of the effectiveness test of fifth graders at SD Negeri 5 Patemon after and before using problem-based learning video media. Based on the results of the normality test for the distribution of the data above, the significance value in the Shapiro-Wilk column gets a value of 0.384 for the pretest and 0.022 for the posttest. This result shows that the significant value in both columns is greater than 0.005. Based on the analysis results, the significance (2-tailed) is 0.000. This result shows that the significance is smaller than 0.05 ($p<0.05$), so H0 is rejected, and H1 is accepted. Thus, it can be seen that there is a significant difference in student learning outcomes of science content before using PBL-based learning videos and after using PBL-based learning video media.

Discussion

Based on the results of data analysis, it was found that there was a significant difference in student learning outcomes of science content before using PBL-based learning videos and after using PBL-based learning video media due to the following factors. First, PBL-based videos can improve learning outcomes. This video-based learning has a unique feature that can make learning effective because the method used is PBL-based, which can improve students' ability to think, especially in thematic learning (Amris & Desyandri, 2021; Hasanah & Fitria, 2021; Pramestika et al., 2020). This thematic learning is

integrated learning that connects and provides meaningful experiences to students to create a learning environment that encourages full student involvement in learning (Dewi & Rukmini, 2019; Laksana et al., 2019). Thematic learning also requires students to be active in learning and solve a problem according to their abilities (Dessiane & Kristin, 2021; Riani et al., 2019). Digital media can help facilitate learning material to increase understanding (Gaudin & Chaliès, 2015; Sudarma & Sukmana, 2022; Wulandari, 2020). This video leads to better learning outcomes because it supports different student learning styles, especially those with audio-visual learning styles. The advantage of this video is that it presents objects concretely and realistically, so it is very good to add to the student learning experience (Nurrohmah et al., 2018; Ulusoy & Çakiroğlu, 2018). In terms of material presentation, this video presents the material clearly so that students can understand well-structured and systematic material. This video is also able to hone problem-solving skills in students. This learning video is designed according to the indicators and learning objectives so that students will have a clearer understanding of the learning flow. In terms of the explanation aspect, the narration presented in the video is very short and varied, so students can understand the material very well.

Second, PBL-based learning videos can increase enthusiasm for learning. This video-based learning has very interesting features to motivate and involve students in learning activities to increase collaboration between students. Based on the results of using this video during the student learning process, it has its charm because it has different learning activities from before, thereby increasing students' learning motivation. This video also reduces boredom because it is combined with teaching techniques through discussion of issues shown in videos which will certainly increase students' memory of the material being studied (Gaudin & Chaliès, 2015; Wulandari, 2020). In terms of the language aspect, the video presents very short sentences but provides important points in learning so that students understand the material more quickly. In addition, in the video, practical assignments aim to hone students' thinking so that learning activities are more interesting than before, which only used the lecture method. Previous findings also state that problem-solving activities carried out by students can develop students' thinking skills (Iskandar, 2014; Krisdiana et al., 2018; Marzuki & Basariah, 2015). After students watch the video at the end of the session, students are given an evaluation task by the teacher to measure students' abilities after participating in learning activities. It is important to measure the achievement of learning activities (Brame, 2016; Laksmi & Suniasih, 2021; Naharir et al., 2019). In learning activities, students can do fun learning that can lead to high creativity so that students can integrate their knowledge and skills using the theme (Haifaturrahmah et al., 2020; Syaifuddin, 2017). Moreover, science learning activities focus more on students so that learning activities become more active and fun (Hairida, 2016; Nanda et al., 2017).

PBL-based video is very suitable because it is flexible and easy to use. The use of video media will attract attention so that it can support a fun learning process (Hikmah & Purnamasari, 2017; Maryanti & Kurniawan, 2018). Other research findings also state that videos presented in colors that are liked by students and interesting can increase students' motivation (Ponza et al., 2018; Widiarti et al., 2021). Previous research findings stated that video evoked a learning atmosphere (Agustien et al., 2018; Nurdin et al., 2019). Another finding states that combining videos with appropriate models can create interesting learning activities to improve student competence (Kawka et al., 2021; Suryawan et al., 2021). Other findings also state that videos are effective in significantly increasing student achievement (Mayang Ayu Sunami & Aslam, 2021; Muna et al., 2017). It is concluded that video is very necessary for learning activities so that the objectives can be achieved. This research implies that teachers in learning activities can use the developed media because it effectively improves student achievement. In addition, this video can also encourage teachers to use other learning models besides lectures that can activate a pleasant learning atmosphere.

4. CONCLUSION

Both experts and students highly qualify for PBL-based learning videos. Based on the results of data analysis, it was found that there was a significant difference in student learning outcomes of science content before using PBL-based learning videos and after using PBL-based learning video media. It is concluded that PBL-based learning videos improve student learning outcomes.

5. REFERENCES

Agustien, R., Umamah, N., & Sumarno, S. (2018). Pengembangan Media Pembelajaran Video Animasi Dua Dimensi Situs Pekauman di Bondowoso Dengan Model Addie Mata Pelajaran Sejarah Kelas X IPS. *Jurnal Edukasi*, *5*(1), 19. https://doi.org/10.19184/jukasi.v5i1.8010.

Ahmad, P., & Triastuti, A. (2021). EFL Teachers' Experiences During the Pandemic: Stories From Rural Area in Tungkal Ilir District. *IJEE (Indonesian Journal of English Education)*, *8*(2), 297–308. https://doi.org/10.15408/ijee.v8i2.22409.

Amris, F. K., & Desyandri. (2021). Pembelajaran Tematik Terpadu menggunakan Model Problem Based Learning di Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 2171–2180. https://doi.org/10.31004/basicedu.v5i1.689.

Anif, S., Sutopo, A., & Prayitno, H. J. (2020). Lesson study validation: Model for social and natural sciences teacher development in the implementation of national curriculum in Muhammadiyah schools, Indonesia. *Universal Journal of Educational Research*, *8*(1), 253–259. https://doi.org/10.13189/ujer.2020.080132.

Argaw, A. S., Haile, B. B., Ayalew, B. T., & Kuma, S. G. (2017). The effect of problem based learning (PBL) instruction on students' motivation and problem solving skills of physics. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(3), 857–871. https://doi.org/10.12973/eurasia.2017.00647a.

Arisantiani, N. K., Putra, M., & Ganing, N. N. (2017). Pengaruh Model Pembelajaran Childrens Learning In Science (Clis) Berbantuan Media Lingkungan Terhadap Kompetensi Pengetahuan IPA. *Journal of Education Technology*, *1*(1). https://doi.org/10.23887/jet.v1i2.11774.

Ariswati, N. P. E. A., Murda, I. N., & Arini, N. W. (2018). Pengaruh Model Pembelajaran Problem Based Learning (PBL) berbantuan Media Question Card terhadap Hasil Belajar IPS Siswa Kelas V SD. *Mimbar PGSD Undikhsa*, *6*(1), 31–42. https://doi.org/10.23887/jjpgsd.v6i1.13105.

Ballesteros, M. A., Daza, M. A., Valdés, J. P., Ratkovich, N., & Reyes, L. H. (2019). Applying PBL methodologies to the chemical engineering courses: Unit operations and modeling and simulation, using a joint course project. *Education for Chemical Engineers*, *27*. https://doi.org/10.1016/j.ece.2019.01.005.

Batubara, H. H., & Batubara, D. S. (2020). Penggunaan Video Tutorial Untuk Mendukung Pembelajaran Daring Di Masa Pandemi Virus Corona. *Muallimuna : Jurnal Madrasah Ibtidaiyah*, *5*(2), 21. https://doi.org/10.31602/muallimuna.v5i2.2950.

Brame, C. J. (2016). Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. *CBE Life Sciences Education*, *15*(4), es6.1-es6.6. https://doi.org/10.1187/cbe.16-03-0125.

Candra Dewi, N. M. L., & Negara, I. G. A. O. (2021). Pengembangan Media Video Animasi IPA pada Pokok Bahasan Sistem Pernapasan Kelas V. *Jurnal Edutech Undiksha*, *9*(1), 122–130. https://doi.org/10.23887/jeu.v9i1.32501.

Dessiane, S. T., & Kristin, F. (2021). Pengembangan Instrumen Penilaian Sikap Sosialpembelajaran Tematik Kelas 4 SD. *Jurnal Pendidikan Ilmu Pengetahuan Sosial Indonesia*, *6*(1), 21–26. https://doi.org/10.26737/jpipsi.v6i1.2310.

Desyandri, D., Muhammadi, M., Mansurdin, M., & Fahmi, R. (2019). Development of integrated thematic teaching material used discovery learning model in grade V elementary school. *Jurnal Konseling Dan Pendidikan*, *7*(1), 16. https://doi.org/10.29210/129400.

Dewantara, J. A., & Nurgiansah, T. H. (2020). Efektivitas Pembelajaran Daring di Masa Pandemi COVID 19 Bagi Mahasiswa Universitas PGRI Yogyakarta. *Jurnal Basicedu*, *5*(1), 367–375. https://doi.org/10.31004/basicedu.v5i1.669.

Dewi, R. A. K., & Rukmini, P. (2019). The effect of thematic learning by using a scientific approach to increase the multiple intelligence of students. *Jurnal Prima Edukasia*, *7*(1), 40–46. https://doi.org/10.21831/jpe.v7i1.24326.

Diartha, P. M. P., Sudarma, I. K., & Suwatra, I. W. (2019). Pengembangan Multimedia Berorientasi Pembelajaran Team Games Tournament Pada Mata Pelajaran IPA Kelas Iv Sekolah Dasar Mutiara Singaraja. *Edutech Universitas Pendidikan Ganesha*, *7*, 1–11. https://doi.org/10.23887/jeu.v7i1.19969.

Fitriyanti, F., Farida, & Zikri, A. (2020). Peningkatan Sikap dan Kemampuan Berpikir Ilmiah Siswa Melalui Model PBL di Sekolah Dasar. *Jurnal Basicedu*, *4*(2). https://doi.org/10.31004/basicedu.v4i2.376.

Gaudin, C., & Chaliès, S. (2015). Video viewing in teacher education and professional development: A literature review. *Educational Research Review*, *16*(7), 41–67. https://doi.org/10.1016/j.edurev.2015.06.001.

Haifaturrahmah, H., Hidayatullah, R., Maryani, S., Nurmiwati, N., & Azizah, A. (2020). Pengembangan Lembar Kerja Siswa Berbasis STEAM untuk Siswa Sekolah Dasar. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *6*(2), 310. https://doi.org/10.33394/jk.v6i2.2604.

Hairida, H. (2016). The effectiveness using inquiry based natural science module with authentic

assessment to improve the critical thinking and inquiry skills of junior high school students. *Jurnal Pendidikan IPA Indonesia*, *5*(2), 209–215. https://doi.org/10.15294/jpii.v5i2.7681.

Hasanah, M., & Fitria, Y. (2021). Pengaruh Model Problem Based Learning terhadap Kemampuan Kognitif IPA pada Pembelajaran Tematik Terpadu. *Jurnal Basicedu*, *5*(3), 1509–1517. https://doi.org/10.31004/basicedu.v5i3.968.

Hidayah, N., Wahyuni, R., & Hasnanto, A. T. (2020). Pengembangan Media Pembelajaran Gambar Berseri Berbasis Pop-Up Book Untuk Meningkatkan Keterampilan Menulis Narasi Bahasa Indonesia. *Jurnal Pendidikan Dan Pembelajaran Dasar*, *7*(1). https://doi.org/10.24042/terampil.v7i1.6182.

Hikmah, V. N., & Purnamasari, I. (2017). Pengembangan Video Animasi "Bang Dasi" Berbasis Aplikasi Camtasia Pada Materi Bangun Datar Kelas V Sekolah Dasar. *Pengembangan Video Animasi "Bang Dasi" Berbasis Aplikasi Camtasia Pada Materi Bangun Datar Kelas V Sekolah Dasar*, *4*(2), 182–191. https://doi.org/10.23819/mimbar-sd.v4i2.6352.

Iskandar, S. M. (2014). Pendekatan Keterampilan Metakognitif Dalam Pembelajaran Sains Di Kelas. *Erudio Journal of Educational Innovation*, *2*(2), 13–20. https://doi.org/10.18551/erudio.2-2.3.

Kadafi, A., Alfaiz, A., Ramli, M., Asri, D. N., & Finayanti, J. (2021). The impact of islamic counseling intervention towards students' mindfulness and anxiety during the covid-19 pandemic. *Islamic Guidance and Counseling Journal*, *4*(1), 55–66. https://doi.org/10.25217/igcj.v4i1.1018.

Kawka, M., MH.Gall, T., Fang, C., Liu, R., & Jiao, R. (2021). Intraoperative video analysis and machine learning models will change the future of surgical training. *Intelligent Surgery*, *1*(1). https://doi.org/10.1016/j.isurg.2021.03.001.

Krisdiana, I., Masfingatin, T., & Murtafiah, W. (2018). The Development of Research-Based Learning Materials with Problem Solving and Problem Posing Oriented of Mathematics Statistics. *Al-Jabar : Jurnal Pendidikan Matematika*, *9*(2), 147–160. https://doi.org/10.24042/ajpm.v9i2.2961.

Kurniawan, D., Kuswandi, D., & Husna, A. (2018). Pengembangan Media Video Pembelajaran Pada Mata Pelajaran Ipa Tentang Sifat Dan Perubahan Wujud Benda Kelas Iv Sdn Merjosari 5 Malang. *JINOTEP (Jurnal Inovasi Dan Teknologi Pembelajaran) Kajian Dan Riset Dalam Teknologi Pembelajaran*, *4*(2), 119–125. https://doi.org/10.17977/um031v4i22018p119.

Kusumayuni, P. N., & Agung, A. A. G. (2021). E-Book with A Scientific Approach on Natural Science Lesson For Fifth Grade Students of Elementary School. *Jurnal Ilmiah Sekolah Dasar*, *5*(1). https://doi.org/10.23887/jisd.v5i1.32048.

Laksana, D. N. L., Seso, M. A., & Riwu, I. U. (2019). Content and Flores Cultural Context Based Thematic Electronic Learning Materials: Teachers and Students' Perception. *European Journal of Education Studies*, *5*(9), 145–155. https://doi.org/10.5281/zenodo.2542946.

Laksmi, N. L. P. A., & Suniasih, N. W. (2021). Pengembangan Media Pembelajaran E-Comic Berbasis Problem Based Learning Materi Siklus Air pada Muatan IPA. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *5*(1), 56. https://doi.org/10.23887/jipp.v5i1.32911.

Lukman, A., Hayati, D. K., & Hakim, N. (2019). Pengembangan Video Animasi Berbasis Kearifan Lokal pada Pembelajaran IPA Kelas V di Sekolah Dasar. *Elementary: Jurnal Ilmiah Pendidikan Dasar*, *5*(2), 153. https://doi.org/10.32332/elementary.v5i2.1750.

Lyócsa, Š., Baumöhl, E., Výrost, T., & Molnár, P. (2020). Fear of the coronavirus and the stock markets. *Finance Research Letters*, *36*. https://doi.org/10.1016/j.frl.2020.101735.

Maryanti, S., & Kurniawan, D. (2018). Pengembangan Media Pembelajaran Video Animasi Stop Motion Untuk Pembelajaran Biologi Dengan Aplikasi Picpac. *Jurnal BIOEDUIN : Program Studi Pendidikan Biologi*, *8*(1), 26–33. https://doi.org/10.15575/bioeduin.v8i1.2922.

Marzuki, M., & Basariah, B. (2015). The influence of problem-based learning and project citizen model in the civic education learning on stu- dent's critical thinking ability and self disci- pline. *Jurnal Cakrawala Pendidikan*, *3*(3). https://doi.org/10.21831/cp.v36i3.14675.

Mayang Ayu Sunami, & Aslam. (2021). Pengaruh Penggunaan Media Pembelajaran Video Animasi Berbasis Zoom Meeting terhadap Minat dan Hasil Belajar IPA Siswa Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 1–9. https://doi.org/10.31004/basicedu.v5i4.1129.

Muliani, N. K. D., & Wibawa, I. M. C. (2019). Pengaruh Model Pembelajaran Inkuiri Terbimbing Berbantuan Video Terhadap Hasil Belajar IPA. *Jurnal Ilmiah Sekolah Dasar*, *3*(1), 107–114. https://doi.org/10.31539/spej.v2i1.333.

Muna, H., Nizaruddin, & Murtianto, Y. H. (2017). Pengembangan Video Pembelajaran Matematika Berbantuan Macromedia Flash 8 Dengan Pendekatan Kontekstual Pada Materi Program Linier Kelas XI. *Aksioma*, *8*(2), 9–18. https://doi.org/10.26877/aks.v8i2.1686.

Naharir, R. A., Dantes, N., & Kusmariyatni, N. (2019). Pengaruh Model Pembelajaran Course Review Horay Berbantuan Media Video Pembelajaran Terhadap Hasil Belajar Matematika Siswa Kelas V Semester Ii Sd Gugus Vi Kecamatan Sukasada. *MImbar PGSD Undiksha*, *7*(1).

https://doi.org/10.23887/jjpgsd.v7i1.16975.

Nanda, K. K., Tegeh, I. M., & Sudarma, I. K. (2017). Pengembangan Video Pembelajaran Berbasis Pendekatan Kontekstual Kelas V di SD Negeri 1 Baktiseraga. *Jurnal Edutech Universitas Pendidikan Ganesha*, *5*(1), 88–99. https://doi.org/10.23887/jeu.v5i1.20627.

Nurdin, E., Ma'aruf, A., Amir, Z., Risnawati, R., Noviarni, N., & Azmi, M. P. (2019). Pemanfaatan video pembelajaran berbasis Geogebra untuk meningkatkan kemampuan pemahaman konsep matematis siswa SMK. *Jurnal Riset Pendidikan Matematika*, *6*(1), 87–98. https://doi.org/10.21831/jrpm.v6i1.18421.

Nurrohmah, F., Putra, F. G., & Farida, F. (2018). Development of Sparkol Video Scribe Assisted Learning Media. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *8*(3), 233–250. https://doi.org/10.30998/formatif.v8i3.2613.

Nurtanto, M., Sofyan, H., Fawaid, M., & Rabiman, R. (2019). Problem-based learning (PBL) in industry 4.0: Improving learning quality through character-based literacy learning and life career skill (LL-LCS). *Universal Journal of Educational Research*, *7*(11), 2487–2494. https://doi.org/10.13189/ujer.2019.071128.

Ponza, P. J. R., Jampel, I. N., & Sudarma, I. K. (2018). Pengembangan Media Video Animasi pada Pembelajaran Siswa Kelas IV di Sekolah Dasar. *Jurnal Edutech Undiksha*, *6*(1), 9–19.

Pramestika, R. A., Suwignyo, H., & Utaya, S. (2020). Model Pembelajaran Creative Problem Solving pada Kemampuan Berpikir Kreatif dan Hasil Belajar Tematik Siswa Sekolah Dasar. *Jurnal Pendidikan Universitas Negeri Malang*, *5*(3), 361–366. https://doi.org/10.17977/jptpp.v5i3.13263.

Pratama, I. G. D. J., Dantes, N., & Yudiana, K. (2020). Thematic Learning Plan With A Nature Of Science Learning Model In The Fourth Grade Of Elementary School. *International Journal of Elementary Education*, *4*(4), 447–453. https://doi.org/10.23887/ijee.v4i4.27208.

Priantini, D. A. (2020). The Development Of Teaching Video Media Based On Tri Kaya Parisudha In Educational Psychology Courses. *Journal of Education Technology*, *4*(4). https://doi.org/10.23887/jet.v4i4.29608.

Primayanti, P. E., Suarjana, I. M., & Astawan, I. G. (2019). Pengaruh Model Pbl Bermuatan Kearifan Lokal terhadap Sikap Sosial dan Kemampuan Berpikir Kritis Matematika Siswa Kelas V di Gugus V Kecamatan Sukasada. *Thinking Skills and Creativity Journal*, *1*(2), 86. https://doi.org/10.23887/tscj.v1i2.20417.

Putri, N. M. L. K., Parmiti, D. P., & Sudarma, I. K. (2020). Pengembangan Video Pembelajaran dengan Bahasa Isyarat Berbasis Pendidikan Karakter pada Siswa Kelas V di SDLB-B Negeri I Buleleng Tahun Pelajaran 2017/2018. *Jurnal EDUTECH Undiksha*, *7*(2), 81–91. https://doi.org/10.23887/jeu.v7i2.23162.

Riani, R. P., Huda, K., & Fajriyah, K. (2019). Pengembangan Media Pembelajaran Tematik "Fun Thinkers Book" Tema Berbagai Pekerjaan. *Jurnal Sinektik*, *2*(2), 173. https://doi.org/10.33061/js.v2i2.3330.

Shah, K., Arfan, M., Mahariq, I., Ahmadian, A., Salahshour, S., & Ferrara, M. (2020). Fractal-Fractional Mathematical Model Addressing the Situation of Corona Virus in Pakistan. *Results in Physics*, *19*, 103560. https://doi.org/10.1016/j.rinp.2020.103560.

Stiawan, I. M. D., Jampel, I. N., & Sudarma, I. K. (2017). Pengembangan Multimedia Interaktif Berbasis Pembelajaran Kontekstual Tentang Tumbuhan Hijau Pada Mata Pelajaran IPA Kelas V Di SD N 3 Tegalcangkring. *Jurnal EDUTECH*, *8*(1), 132–141. https://doi.org/10.23887/jeu.v5i1.10552.

Suantara, I. K. T., Ganing, N. N., Agung, I. G., & Wulandari, A. (2019). Pengaruh Model Pembelajaran Think Pair Share Berbantuan Media TTS terhadap Kompetensi Pengetahuan IPA. *Jurnal Ilmiah Sekolah Dasar*, *3*(4), 473–480. https://doi.org/10.23887/jisd.v3i4.21783.

Sudarma, I. K., & Sukmana, A. I. W. I. Y. (2022). Improving Children's Cognitive Ability Through Information Processing Theory-Based Digital Content. *International Journal of Elementary Education*, *6*(1). https://doi.org/10.23887/ijee.v6i1.41464.

Suryaningsih, N. M. A., & Rimpiati, N. L. (2018). Implementation of Game-Based Thematic Science Approach in Developing Early Childhood Cognitive Capabilities. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *2*(2), 194–201. https://doi.org/10.31004/obsesi.v2i2.90.

Suryawan, I. P. P., Pratiwi, K. A. M., & Suharta, I. G. P. (2021). Development of Flipped Classroom Learning Combined with Google Classroom and Video Conference to Improve Students' Learning Independent and Mathematics Learning Outcomes. *Journal of Education Technology*, *5*(3), 375. https://doi.org/10.23887/jet.v5i3.34466.

Syaifuddin, M. (2017). Implementasi Pembelajaran Tematik di Kelas 2 SD Negeri Demangan Yogyakarta. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, *2*(2), 139. https://doi.org/10.24042/tadris.v2i2.2142.

Syarifudin, A. S. (2020). Impelementasi Pembelajaran Daring Untuk Meningkatkan Mutu Pendidikan

Sebagai Dampak Diterapkannya Social Distancing. *Jurnal Pendidikan Bahasa Dan Sastra Indonesia Metalingua*, *5*(1), 31–34. https://doi.org/10.21107/METALINGUA.V5I1.7072.

Tamboto, H., Tambingon, H. N., Lengkong, J. S. ., & Rotty, V. N. J. (2021). The Involvement of Students' Parents in Organizing the Learning from Home at Elementary Schools in Tomohon City. *Asia Pacific Journal of Management and Education*, *4*(1), 35–51. https://doi.org/10.32535/apjme.v4i1.1044.

Tambunan, L. R., & Sundari, E. (2020). Pengembangan Buku Digital Pada Materi Persamaan Garis Singgung Lingkaran. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *9*(4), 1184. https://doi.org/10.24127/ajpm.v9i4.3084.

Tegeh, I. M., & Kirna, I. M. (2013). Pengembangan Bahan Ajar Metode Penelitian Pendidikan dengan ADDIE Model. *Jurnal IKA*, *11*(1), 16.

Ulusoy, F., & Çakiroğlu, E. (2018). Using video cases and small-scale research projects to explore prospective mathematics teachers' noticing of student thinking. *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(11). https://doi.org/10.29333/ejmste/92020.

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.

Widiarti, N. K., Sudarma, I. K., & Tegeh, I. M. (2021). Meningkatkan Hasil Belajar Matematika Kelas V SD Melalui Media Video Pembelajaran. *Jurnal Edutech Undiksha*, *9*(2), 195. https://doi.org/10.23887/jeu.v9i2.38376.

Widiartini, P. D. O., Made Putra, M. P., & Manuaba, I. B. S. (2019). Pengaruh Model Pembelajaran Group Investigation Berbasis Tri Hita Karana Terhadap Kompetensi Pengetahuan IPA. *Jurnal Ilmiah Sekolah Dasar*. https://doi.org/10.23887/jisd.v3i3.19476.

Widiyasanti, M., Proketen, S. D., & Yogyakarta, N. (2018). Pengembangan Media Video Animasi Untuk Meningkatkan Motivasi Belajar Dan Karakter Tanggung Jawab Siswa Kelas V. *Jurnal Pendidikan Karakter*, *8*(1), 1–16. https://doi.org/10.21831/jpk.v8i1.21489.

Wulandari, Y. (2020). Pengembangan Media Video Berbasis Powtoon pada Mata Pelajaran IPA di Kelas V. *Jurnal Pendidikan Sains Indonesia (Indonesian Journal of Science Education)*, *8*(2). https://doi.org/10.24815/jpsi.v8i2.16835.

Wuryani, M. T., & Yamtinah, S. (2018). Textbooks Thematic Based Character Education on Thematic Learning Primary School: An Influence. *International Journal of Educational Methodology*, *4*(2), 75–81. https://doi.org/10.12973/ijem.4.2.75.

Yulia, H. (2020). Online Learning to Prevent the Spread of Pandemic Corona Virus in Indonesia. *ETERNAL (English Teaching Journal)*, *11*(1). https://doi.org/10.26877/eternal.v11i1.6068.

Zhou, Z. (2018). An Empirical Study on the Influence of PBL Teaching Model on College Students' Critical Thinking Ability. *English Language Teaching*, *11*(4), 15. https://doi.org/10.5539/elt.v11n4p15.