

Learning Video Media Based on the Powtoon Application on Solar System Learning Topics

Gede Edo Wahyu Sanjaya^{1*}, Kadek Yudiana², I Gusti Ngurah Japa³

^{1,2,3} Program Studi Pendidikan Guru Sekolah Dasar, Universitas Pendidikan Ganesha, Indonesia

ARTICLE INFO

Article history:

Received March 21, 2021
Revised March 24, 2021
Accepted May 19, 2021
Available online May 25, 2021

Kata Kunci:

Media Pembelajaran, Powtoon, Video Pembelajaran

Keywords:

Learning Media, Powtoon, Learning Video



This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.

Copyright © 2021 by Author. Published by Universitas Pendidikan Ganesha.

ABSTRAK

Minimnya ketersediaan media pembelajaran inovatif yang mampu memuat materi secara efektif berdampak pada rendahnya motivasi belajar serta pemahaman siswa terhadap materi. Dibutuhkan media pembelajaran inovatif yang dapat meningkatkan mutu pembelajaran dan mewujudkan proses belajar yang lebih bermakna bagi siswa. Penelitian pengembangan ini bertujuan untuk mengembangkan media video pembelajaran berbasis aplikasi powtoon pada topik tata surya kelas VI yang telah teruji validitasnya. Penelitian pengembangan ini menggunakan model ADDIE. Subjek dalam penelitian ini adalah media video pembelajaran berbasis aplikasi powtoon pada topik tata surya kelas VI dengan validitas media sebagai objek dalam penelitian. Pengumpulan data menggunakan metode kuisioner dan instrumen rating scale yang berupa lembar penilaian yang diberikan kepada 2 ahli materi, 2 ahli media, dan 2 ahli praktisi untuk mengetahui validitas media video pembelajaran berbasis aplikasi powtoon pada topik tata surya. Persentase skor yang diperoleh 84% dan 88% dari ahli materi, 80% dan 86% dari ahli media, 89% dan 87% dari ahli praktisi dengan predikat baik. Jadi, berdasarkan analisis tersebut media video pembelajaran berbasis aplikasi powtoon pada topik tata surya kelas VI sudah valid dan layak digunakan dalam pembelajaran.

ABSTRACT

The lack of availability of innovative learning media that is able to contain material effectively results in low learning motivation and students' understanding of the material. It takes innovative learning media that can improve the quality of learning and create a more meaningful learning process for students. This development research aims to develop instructional video media based on the powtoon application on the topic of the 6th grade solar system whose validity has been tested. This development research uses the ADDIE model. The subjects in this study were instructional video media based on the powtoon application on the topic of the 6th grade solar system with the validity of the media as objects in the study. The data were collected using a questionnaire method and a rating scale instrument in the form of an assessment sheet given to 2 material experts, 2 media experts, and 2 practitioner experts to determine the validity of the powtoon application-based instructional video media on the topic of the solar system. The percentage of scores obtained was 84% and 88% from material experts, 80% and 86% from media experts, 89% and 87% from good predicate practitioners. So, based on this analysis, the instructional video media based on the powtoon application on the topic of the 6th grade solar system is valid and suitable for use in learning.

1. INTRODUCTION

Media is a tool or intermediary to facilitate learning. Media is also something that is used to stimulate thoughts, abilities and skills that can encourage the learning process (Nurdiansyah et al., 2018 : Sulfemi & Mayasari, 2019). Media is a means of channeling learning information that is conveyed to the recipient of the message (Paranna & Airlanda, 2020 : Suarjana et al., 2017). In learning activities, the media functions as instruction where the information in the media must involve students in the form of real activities so that the learning process can occur (Herayanti et al., 2017; MS et al., 2017). In addition, media is anything that can transmit information to recipients of information (Angraini, 2017 : Pramita et al., 2019). Learning media is useful to complement and improve the quality of the learning process, the use of learning media will help increase student motivation. Learning media emphasizes that the media is a message channel to condition a person to learn (Herayanti et al., 2017 : Sundari, 2019). It can be concluded that the media is a means of conveying information to recipients of information. In learning media plays a very important role in facilitating the delivery of learning materials, therefore the use of media needs to be done. With the existence of innovative learning media, it will increase student motivation in following the learning process. Media can be said to be innovative when the media is able to involve many of the students' senses in its use (Wati & Widiandyah, 2020; Wulandari et al., 2020).

*Corresponding author.

E-mail addresses: edosanjaya379@gmail.com (Gede Edo Wahyu Sanjaya)

But in reality, the learning that is carried out in the teacher's school in explaining the material still often uses the lecture method so that students become less enthusiastic in learning. In addition, the use of media in the teaching and learning process is still lacking. This happens because teachers in developing learning innovations such as developing learning media are still very minimal (Mustaqim & Kurniawan, 2017; Rahayu et al., 2020). The limited availability of learning media in schools is also an obstacle in the learning process in schools (Herliandry et al., 2020). In the learning process, up to now, most of the teachers still use book media as a process of learning activities, where the books used still have shortcomings in terms of unattractive presentation of the material. (Jampel et al., 2018; Laksono et al., 2020). Especially in books on science content, it is still not equipped with new innovations that can enable students to improve their ability to think scientifically. Science is learning that contains components of scientific products, methods, and scientific attitudes (Dwi et al., 2021; Narut & Supradi, 2019). Based on the results of the document study in the sixth grade student books on science content, especially on the topic of the solar system, it was found that the material contained in the student books was very minimal. This is supported by questionnaire data shown to the VIA and VIB class teachers of SDN 2 Kalibukbuk for the 2020/2021 school year. Where it is shown that 100% of teachers state that the material contained in student books is very minimal so it is necessary to develop material in student books, 100% of teachers only use picture media in learning activities, learning media available in schools is limited and 100% of teachers state science learning material is necessary. developed into a Learning Video media to help the learning process during a pandemic and make it easier for teachers to explain material and can increase student motivation and understanding in learning. If this is allowed to continue, the level of student understanding of the learning material, especially in science learning content, will not be optimal, and will affect student motivation and achievement in the learning process.

Seeing the inconsistencies between expectations and conditions in the field, a solution is needed to overcome this. One solution that can be done to overcome this problem is to develop learning media that is attractive to students and in accordance with current learning conditions, by developing learning media that is able to attract students' interest in learning. This is supported by the results of the questionnaire shown to the homeroom teacher of class VI SDN 2 Kalibukbuk who stated the need to use learning media that can increase student interest in learning during this pandemic which is easy for students to use. The type of learning media that is suitable to be developed is audio visual media. Where audio visual media have been packaged into various types according to the times and adapted to the characteristics of students. One of the audio-visual media that can attract students' interest in learning is that which is developed into a learning video using the powtoon application. This is supported by several relevant research results that said the powtoon application presents learning in an audio-visual form which will make learning more attractive to students and learning will be more fun because students are no longer learning with books that look less attractive through the many features they have, such as animation, transition effects more lively and more attractive to use (Arif & Muthoharoh, 2021).

Previous relevant research stated that with the features in the media, students will become more enthusiastic in learning activities because students are more interested in learning media in which there are animated images, transitions and even not only observing but also listening to the sounds contained in the media (Dewi et al., 2020). Other research stated that using instructional video media using the Powtoon application can optimize learning activities (Febriana & Wahyuningsih, 2019; Fitriyani, 2019). In addition, some research show that interactive video learning media on science subjects ecosystem component material can improve students' understanding of the material (Laksono et al., 2020; Manurung, 2020; Maulana & Suwandi, 2019). In other hand, some research stated that the PowToon learning media developed is practical and has a potential effect in increasing understanding of lecture material (Nurdiansyah et al., 2018; Sukmanasa et al., 2020). Students really understand the material and are very interested in learning science so that it is effectively used in the learning process with powtoon-based animated video media (Wulandari et al., 2020). However, from some of the media developed, there are several things that are not yet optimal, ranging from the absence of sound dubbing to less attractive animated images.

Therefore, it is necessary to carry out further development to optimize aspects that are deemed not optimal based on previous research. In this development, the powtoon-based learning video media was enhanced by adding voice dubbing so that the material presented was clearer and the understanding of the material obtained by students was the same as one another. The use of animation in instructional video media based on the powtoon application on the media developed this time will be more diverse so that students are more interested in participating in the learning process. The material to be used in the development of instructional video media based on the powtoon application is the material for grade VI students with the topic of the solar system. This study aims to determine the validity of the powtoon

application-based instructional video media that can be developed on the topic of solar system for 6th grade students.

2. METHOD

The research design used in this research is product-oriented research and development. The product developed is a learning video media based on the Powtoon application on the topic of learning the Solar System for class VI. Products that have been developed will be validated by 6 experts consisting of 2 material experts, 2 instructional media experts, and 2 practitioner experts. The development model used in this research is the ADDIE model (Analyze, Design, Development, Implementation, Evaluation). This model is used because this model has a systematic structure (Bakhri, 2019). In this study, the implementation and evaluation stages could not be carried out due to the constraints of the health emergency situation caused by the Covid-19 pandemic. The Analyze stage, is also known as the needs analysis stage. At this stage, activities will be carried out in the form of analysis and information collection as requirements for product development that are in accordance with the needs of the research itself, and are deemed suitable to be used for product development. The activities carried out on Analyze resistant are as follows; (1) needs analysis is carried out by observation and interviews with teachers and students of grade VI SDN 2 Kalibukbuk; (2) analysis of student characteristics carried out during the learning process carried out during observation at SDN 2 Kalibukbuk; (3) curriculum analysis includes KD analysis and learning achievement indicators in the development of instructional video media based on the Powtoon application; (4) an analysis of making media is carried out in order to develop relevant media.

The Design stage, aims to find various options or ways in order to develop a design for a learning video product in a more efficient format before it is fully developed. The stages carried out at this stage are as follows; (1) the design of the powtoon application-based learning video media on the topic of Solar System learning, is carried out by determining what learning materials will be included in the powtoon application-based learning video media, so that the resulting media is able to load learning material effectively and efficiently ; (2) making instructional video media designs, choosing the design in the development of learning media in the form of learning videos based on the powtoon application is intended to design or design a learning video format that is able to display learning material as attractive as possible. Development stage, this stage is the implementation stage of the product design stage that was carried out previously. This stage aims to produce the final product, namely learning video media based on the powtoon application on the topic of Class VI Solar System learning. This stage has a series of activities as follows; (1) making instructional video media based on the powtoon application, making learning video media based on the powtoon application in terms of the results of the analysis of the development stage that has been carried out previously, both the analysis stage and the design stage; (2) assessment or validation, this stage is carried out to produce a feasible set of instructional video media based on the Powtoon application. This activity involves 6 experts who are considered competent in their fields to test, justify, and provide input or suggestions for improvement. The 6 experts consist of 2 material experts, 2 instructional media experts, and 2 practitioner experts. The data collection technique used in this development research was a questionnaire which was assessed by 6 experts. Data analysis in this study used quantitative descriptive data analysis techniques, which consisted of a rating scale analysis in order to find product validity. The validity of the product is measured using the percentage obtained based on the score given by the validator. After obtaining a percentage score from the results of the sum of the data as a whole, the criteria for the validity of the product developed can be seen based on the five scale conversion guidelines in table 1 below.

Table 1. Five scale conversion guidelines

Category	Achievement Rate (%)
Very Good	90 - 100
Good	75 - 89
Enough	65 - 74
Bad	55 - 64
Very Bad	0 - 54

3. RESULT AND DISCUSSION

Result

The result of this research is a product in the form of instructional video media based on the powtoon application on the topic of class VI Solar System learning. The analyze stage consists of 4 stages,

namely as follows; (1) needs analysis, the results of the analysis of the needs for instructional video media include the availability of material in student textbooks, the types of learning media that are often used in the learning process, the availability of learning media in schools, the percentage of needs for developing innovative learning media; (2) analysis of student characteristics, the results of student characteristics analysis show that the cognitive development of students is at a concrete operational stage according to Piaget's theory of cognitive development, in this cognitive stage students will easily understand the material presented with the help of image media or other media; (3) curriculum analysis, the results of this analysis will be the basis for formulating Basic Competencies (KD) and Competency Achievement Indicators contained in teacher books and student books used for guidelines in media development; (4) media analysis, the results of this analysis are aspects that will be used in developing learning video media, including material aspects, language aspects, presentation aspects, format aspects, visual aspects, sound aspects, effective aspects, and practical aspects..

The second stage is the design stage, at this stage it has been able to produce a prototype design from the powtoon application-based learning video media. The design stage begins by determining the Basic Competence (KD) and Competency Achievement Indicators (GPA). Then look for the topic material of the solar system that is in accordance with the Basic Competencies and Competency Achievement Indicators. Next determine the video ratio with the ratio used 16: 9 then make the background after that, continue by assigning animated characters and looking for images, followed by compiling them using the powtoon application after that dubbing using a voice recorder then combining using the KineMaster application. The last stage is the development stage, at this stage it has been able to produce revised learning media based on input or input from experts as well as assessments from practitioners, learning tools that have been successfully developed are learning video media based on the powtoon application on the topic of Class VI Solar System learning. In the process, there are several suggestions submitted by experts, including: (1) inclusion of development identities, (2) colored media explanations, clear sizes, fonts and colors, (3) the title of each scene must be uppercase and greater than the sub the title, (4) the shape must be colored with the same color, (5) the voice of the explanation is less enthusiastic so it needs to be studied so that it is more enthusiastic so that there is an invitation so that students have curiosity. After going through the revision process, the learning media has reached the final stage. The image of learning video media that has been successfully developed can be seen in Figure 1.

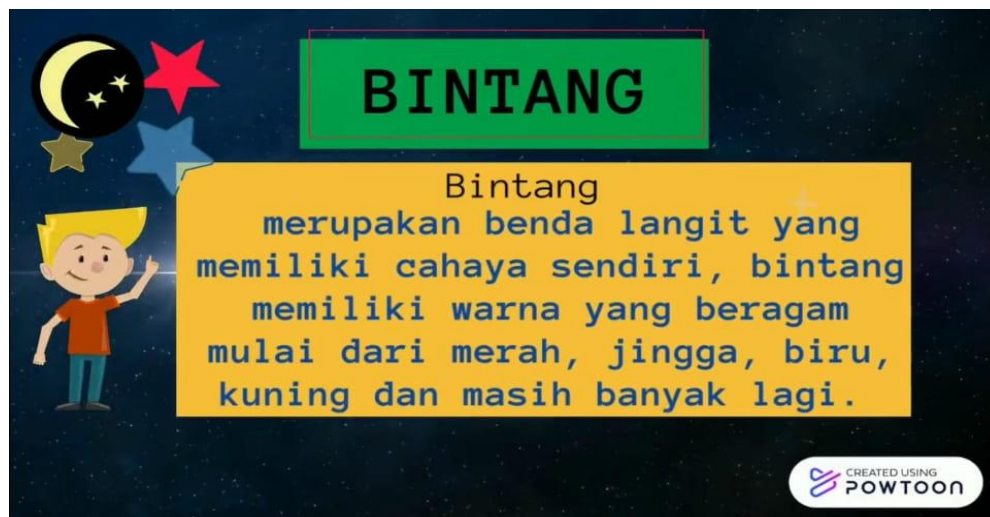


Figure 1. Learning Video Media

The results of the validation carried out by 6 experts stated that the product of instructional video media based on the powtoon application on the topic of learning Solar System as a whole was in the good / valid category with the acquisition of a percentage of 84% from material experts I with good categories, 88% from material experts II with good category, 80% of media expert I with good category, 86% from media expert II with good category, 89% from expert practitioner I with good category, and 87% from expert practitioner II with good category. Based on the PAP table for the achievement of a scale of five conversions, the media developed is in good qualifications. So the instructional video media based on the powtoon application on the topic of the solar system as a whole is good.

Discussions

The first stage to be carried out is the analyze stage which is carried out with the activities of needs analysis, student characteristic analysis, curriculum analysis, and media analysis (Wilujeng et al., 2020). Based on the results of the questionnaire, it was obtained that: (1) 100% of teachers stated that the material contained in student books was very minimal, (2) 100% of teachers only used picture media in learning activities, (3) 100% of teachers stated that learning media in schools were limited, and (4) 100% of teachers stated that science material needed to be developed into instructional video media. Based on the results of interviews conducted with grade VI teachers of SDN 2 Kalibukbuk, it was stated that learning carried out with students only used pictures and books. There is no special media to study on the topic of the solar system so that it makes students less enthusiastic and enthusiastic about learning. Elementary school students in Piaget's theory of cognitive development are at a concrete operational stage. Where children can understand if assisted by using pictures or other media. Assistance from the media is needed to assist the learning process and facilitate students' understanding of the learning material. At the stage of curriculum analysis, it is carried out by analyzing Basic Competence (KD) and Competency Achievement Indicators contained in the teacher's and student's books which are used for guidelines in media development. At the media analysis stage, it is carried out to obtain information on the quality of the media that is good for use. In developing this media, there are criteria used such as material aspects including conformity with basic competencies and indicators, suitability of learning objectives, presentation of material clearly. Language aspects include the suitability of using language rules, using language that is easy to understand. The presentation aspect includes the composition in the presentation, the presentation of the material is interesting. Format aspects include suitability of font size, suitability of media character layout. Visual aspects which include video quality, display writing, color compatibility. The sound aspect includes the sound presented clearly, the suitability of the music to the student's character. Effective aspects include the effectiveness of media use. Practical aspects include ease of use of media.

The second stage is the design stage, at this stage it starts with determining the Basic Competence (KD) and Competency Achievement Indicators (Hartini et al., 2018). Then proceed by looking for material on the topic of the solar system that is in accordance with the Basic Competence and Competency Achievement Indicators, followed by determining the ratio of the video to be used with a 16: 9 ratio, then making the background after that it is continued by determining animated characters and looking for images, followed by compiling them using powtoon application, after that the final stage of the design is doing dubbing using a voice recorder. The next stage is the development stage, implementing the development of instructional video media based on the powtoon application according to the design made (Lesmono et al., 2018). Media designs are developed with covers containing attractive animations. The learning video media developed are also equipped with learning objectives, delivery of material to the end, and conclusions are presented attractively with animations and bright colors. In addition, the instructional video media based on the powtoon application developed also has a duration of 8 minutes 12 seconds, the media also contains cheerful and interesting songs. After developing the media, it was followed by a media review conducted by 6 experts consisting of 2 material experts, 2 media experts, and 2 expert practitioners. The review is carried out by providing an assessment sheet for the powtoon application-based learning video media to the experts. After conducting a media assessment by experts, then a product revision is carried out. Product revisions are carried out taking into account comments and suggestions from experts.

Based on the predicate obtained, the media developed has been tested for its validity and is suitable to be used as learning media. Research on the development of instructional video media based on the powtoon application on the topic of the solar system is feasible for use for grade VI SD students, because elementary students are at the concrete operational stage. The concrete operational stage of the child can be grouped into concrete thinking, meaning that they can understand if assisted by the media of images or other concrete objects (Bujuri, 2018). This can be overcome by developing instructional video media products based on the powtoon application on the topic of the solar system. The results of the development of the Powtoon-based learning media product that has been developed have been tested for validity and are in a good predicate as a learning medium. The results obtained are in line with the research which states that the use of powtoon-based instructional video media in science subjects is able to make students understand the material well so that it is very suitable for use in the learning process (Maulana & Suwandi, 2019). This is also supported by research which states that by using the powtoon application-based learning video media the learning outcomes of students' speaking skills have increased so that the powtoon-based learning video media is very feasible to use (Febriana & Wahyuningsih, 2019). The results obtained are also in line with research which states that the powtoon application-based video media facilitates understanding and improves the students' science representation abilities so that the

powtoon application-based media is suitable for use (Manurung, 2020). Based on this, the development of instructional video media based on the powtoon application on the topic of the solar system being developed is suitable for use in learning activities.

The implication of this research is that the product developed can be a reference in the learning process, especially in the material of the solar system, because the media developed has been considered feasible and can increase student motivation in participating in the learning process. It is hoped that the problems regarding the lack of innovative media and the low motivation of students in participating in the learning process can be resolved.

4. CONCLUSION

The media developed is fit for use with a good category. So that the instructional video media based on the powtoon application on the material of the solar system deserves to be used as a reference in overcoming the problem of the lack of innovative media which has an impact on the low motivation of students to participate in the learning process.

5. REFERENCES

- Angraini, R. (2017). Karakteristik Media Yang Tepat Dalam Pembelajaran Pendidikan Kewarganegaraan (Pkn) Sebagai Pendidikan Nilai. *Journal of Moral and Civic Education*, 1(1), 14–24. <https://doi.org/10.24036/8851412020171116>.
- Arif, S., & Muthoharoh, A. N. (2021). Pengembangan Media Pembelajaran Berbasis Powtoon dalam Meningkatkan Kemampuan Representasi IPA di Tengah Pandemi Covid 19. *Jurnal IPA & Pembelajaran IPA*, 5(1), 112–124. <https://doi.org/10.24815/jipi.v5i1.19779>.
- Bakhri, S. (2019). Animasi Interaktif Pembelajaran Huruf dan Angka Menggunakan Model ADDIE. *Jurnal Ilmiah Penelitian Dan Penerapan Teknologi Sistem Informasi*, 3(2), 130–144. <https://doi.org/10.29407/intensiv.v3i2.12666>.
- Bujuri, D. A. (2018). Analisis Perkembangan Kognitif Anak Usia Dasar dan Implikasinya dalam Kegiatan Belajar Mengajar. *LITERASI (Jurnal Ilmu Pendidikan)*, 9(1), 37. [https://doi.org/10.21927/literasi.2018.9\(1\).37-50](https://doi.org/10.21927/literasi.2018.9(1).37-50).
- Dewi, R., Asyura, I., & Pamungkas, A. S. (2020). The Development Design Of Digital Teaching Materials Assisted By Powtoon Application For Science Learning In Primary School. *Jurnal Pendidikan Sekolah Dasar*, 6(2), 212–226. <http://dx.doi.org/10.30870/jpsd.v6i2.9490>.
- Dwi, Y., Septyarini, A., Gading, I. K., & Antara, P. A. (2021). Validity and Reliability : Early Childhood ' s Locomotor Capability Assessment Instruments. *Advances in Social Science, Education and Humanities Research*, 540(Ictes 2020), 400–404. <https://dx.doi.org/10.2991/assehr.k.210407.271>.
- Febriana, M. B., & Wahyuningsih, F. (2019). Hasil Belajar Keterampilan Berbicara Bahasa Jerman Dengan Menggunakan Media Pembelajaran Video Berbasis Aplikasi Powtoon. *LATERNE*, 8(2), 68–70.
- Fitriyani, N. (2019). Pengembangan Media Pembelajaran Audio-Visual Powtoon Tentang Konsep Diri Dalam Bimbingan Kelompok Untuk Peserta Didik Sekolah Dasar. *Jurnal Tunas Bangsa*, 6(1), 104–114.
- Hartini, S., Firdausi, S., Misbah, & Sulaeman, N. F. (2018). The development of physics teaching materials based on local wisdom to train Saraba Kawa characters. *Jurnal Pendidikan IPA Indonesia*, 7(2), 130–137. <https://doi.org/10.15294/jpii.v7i2.14249>.
- Herayanti, L., Habibi, H., & Fuaddunazmi, M. (2017). Pengembangan Media Pembelajaran Berbasis Moodle pada Matakuliah Fisika Dasar. *Jurnal Cakrawala Pendidikan*, 36(2), 210–219. <https://doi.org/10.21831/cp.v36i2.13077>.
- Herliandry, L. D., Nurhasanah, N., Suban, M. E., & Kuswanto, H. (2020). Pembelajaran Pada Masa Pandemi Covid-19. *JTP - Jurnal Teknologi Pendidikan*, 22(1), 65–70. <https://doi.org/10.21009/jtp.v22i1.15286>.
- Jampel, I. N., Fahrurrozi, Artawan, G., Widiana, I. W., Parmiti, D. P., & Hellman, J. (2018). Studying natural science in elementary school using nos-oriented cooperative learning model with the NHT type. *Jurnal Pendidikan IPA Indonesia*, 7(2), 138–146. <https://doi.org/10.15294/jpii.v7i2.9863>.
- Laksono, D., Iriansyah, H. S., & Oktaviana, E. (2020). Pengembangan Media Pembelajaran Video Interaktif Powtoon pada Mata Pelajaran IPA Materi Komponen Ekosistem. *Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara II*, 255–262.
- Lesmono, A. D., Bachtiar, R. W., Maryani, & Muzdalifah, A. (2018). The instructional-based andro-web comics on work and energy topic for senior high school students. *Jurnal Pendidikan IPA Indonesia*,

- 7(2), 147–153. <https://doi.org/10.15294/jpii.v7i2.14245>.
- Manurung, I. F. U. (2020). Project Based Learning Activities : Media Powtoon Dalam Pembelajaran Ipa Sd Untuk Menganalisis Keterampilan Berfikir Kreatif Mahasiswa. *ESJ (Elementary School Journal)*, 10(1). <https://doi.org/10.24114/esjgsd.v10i1.19286>.
- Maulana, I., & Suwandi. (2019). Keefektifan Media Powtoon Dalam Pembelajaran Ipa Ditinjau Dari Minat Dan Hasil Belajar Pada Siswa Kelas V Sd. *Indonesian Journal of Conservation*, 8(1). <https://doi.org/10.15294/ijc.v8i1.22680>.
- MS, B., Rahmawati, S., & Wardani, S. (2017). The Development of A Learning Media for Visualizing the Pancasila Values Based on Information and Communication Technology. *Jurnal Cakrawala Pendidikan*, 36(3), 502–521. <https://doi.org/10.21831/cp.v36i3.12748>.
- Mustaqim, I., & Kurniawan, N. (2017). Pengembangan Media Pembelajaran Pai Berbasis Augmented Reality. *Jurnal Edukasi Elektro*, 1(1). <https://doi.org/10.21831/jee.v1i1.13267>.
- Narut, Y. F., & Supradi, K. (2019). Literasi sains peserta didik dalam pembelajaran ipa di indonesia. *Jurnal Inovasi Pendidikan Dasar*, 3(1), 61–69.
- Nurdiansyah, E., Faisal, E. El, & Sulkipani, S. (2018). Pengembangan media pembelajaran berbasis PowToon pada perkuliahan Pendidikan Kewarganegaraan. *Jurnal Civics: Media Kajian Kewarganegaraan*, 15(1), 1–8. <https://doi.org/10.21831/jc.v15i1.16875>.
- Paranna, M., & Airlanda, G. S. (2020). Pengaruh Model Pembelajaran Circuit Learning Berbantu Multimedia Dan Media Sederhana Terhadap Kreativitas Siswa. *Jurnal Riset Pendidikan Dasar*, 03(April), 57–63. <https://doi.org/10.26618/jrpd.v3i1.3231>.
- Pramita, P. A., Sudarma, I. K., & Murda, I. N. (2019). Pengaruh Model Pembelajaran Scramble Berbantuan Media Gambar terhadap Hasil Belajar IPA. *Jurnal Pedagogi Dan Pembelajaran*, 2(2), 186. <https://doi.org/10.23887/jp2.v2i2.17907>.
- Rahayu, S., Bambut, K. E. N., & Fajaroh, F. (2020). Do different discussion activities in developing scientific argumentation affect students' motivation in chemistry? *Cakrawala Pendidikan*, 39(3), 679–693. <https://doi.org/10.21831/cp.v39i3.32228>.
- Suarjana, I. M., Nanci Riastini, N. P., & Yudha Pustaka, I. G. N. (2017). Penerapan Pendekatan Kontekstual Berbantuan Media Konkret Untuk Meningkatkan Aktivitas Dan Hasil Belajar. *International Journal of Elementary Education*. <https://doi.org/10.23887/ijee.v1i2.11601>.
- Sukmanasa, E., Novita, L., & Maesya, A. (2020). Pendampingan pembuatan media pembelajaran Powtoon bagi guru Sekolah Dasar Gugus 1 Kota Bogor. *Transformasi: Jurnal Pengabdian Masyarakat*, 16(1), 95–105. <https://doi.org/10.20414/transformasi.v16i1.2140>.
- Sulfemi, W. B., & Mayasari, N. (2019). Peranan Model Pembelajaran Value Clarification Technique Berbantuan Media Audio Visual Untuk Meningkatkan Hasil Belajar Ips. *Jurnal Pendidikan*, 20(1), 53–68. <https://doi.org/10.33830/jp.v20i1.235.2019>.
- Sundari, N. (2019). Penggunaan Media Gambar dalam Meningkatkan Keaktifan Siswa dalam Pembelajaran Pengetahuan Sosial di Sekolah Dasar. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699. <https://doi.org/10.1017/CBO9781107415324.004>.
- Wati, E. K., & Widiansyah, N. (2020). Design of learning media: Modeling & simulation of building thermal comfort optimization system in building physics course. *Jurnal Pendidikan IPA Indonesia*, 9(2), 257–266. <https://doi.org/10.15294/jpii.v9i2.23504>.
- Wilujeng, I., Tadeko, N., & Dwandaru, W. S. B. (2020). Website-based technological pedagogical and content knowledge for learning preparation of science teachers. *Cakrawala Pendidikan*, 39(3), 545–559. <https://doi.org/10.21831/cp.v39i3.31228>.
- Wulandari, Y., Ruhiat, Y., & Nulhakim, L. (2020). Pengembangan Media Video Berbasis Powtoon pada Mata Pelajaran IPA di Kelas V. *Jurnal Pendidikan Sains Indonesia (Indonesian Journal of Science Education)*, 8(2), 269–279. <https://doi.org/10.24815/jpsi.v8i2.16835>.