

The Development of Learning Video Based on Micro-Learning Principle Towards Science Subject in Junior High School

Made Chandra Adhipertama^{1*}, I Nyoman Jampel², I Gde Wawan Sudatha³



^{1,2,3}Department of Educational Sciences, Psychology, and Guidance, Ganesha University of Education, Singaraja, Indonesia

*Corresponding author: made.chandra.adhipertama@undiksha.ac.id

Abstract

Learning videos can attract the students' interest and facilitate them during the learning process. The use of learning media is an alternative in the process of developing better learning instruction. This study aims to analyze and develop instructional video products based on the principles of microlearning in Science subjects. The data collection methods used were observation, interview, document recording, and questionnaires. This development research used the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model. The data generated in this research were qualitative and quantitative. The review result given by the learning content expert was in the category of very excellent with its percentage of 95%. The reviews by learning design experts obtained an excellent category, and the percentage score was 95%. The review results by learning media experts obtained an excellent category and the percentage score was 91.6%. Besides, the results of individual testing obtained an excellent category and the percentage score was 98.4%. The results of the small-group testing obtained an excellent category and the percentage score was 97.5%. Therefore, this study revealed that learning videos based on micro-learning principles sat in the excellent qualifications and were suitable to be implemented as supporting learning activities to establish more interesting and enjoyable activities.

Keywords: Learning Videos, Microlearning, Science, ADDIE

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Introduction

Media is an essential part of the learning process to help the teacher transfer and explain the lesson, which can be observed from audiovisual tools to stimulate the students during the lesson (Fadhil, 2015; Lestari & Zulmiyetri). Media can be encountered in every form of assisting learning tools, which can be used as a bridge to transfer the lesson in order to achieve the learning objective (Agustien et al., 2018; Herayanti, 2019). The employed media helps the teacher clarify the information, emphasize a certain part of the lesson, vary the learning activity, and motivate the students in the classroom (Wahyu et al., 2020). It means that learning media is a tool to clarify some information given and improve the students' learning motivation. Using learning media can replace one of the teachers' roles in the lesson as a presenter because learning media has some unique potential to help the students in the learning process (Hamdanillah et al., 2017; Rosnihayati, 2017). Considering this phenomenon, it is necessary to establish and develop a creative learning media to interact the students into a creative science learning process that can be encountered on the employment of learning video as a learning media.

Video is categorized as an effective learning medium to help the students to comprehend the learning material because it provides the students with moving pictures and

voice which is interesting for the students (Manzilina et al, 2020; Pratiwi et al., 2019). The ability of video to visualize the lesson really effectively helps the students to understand the dynamic material. This is also supported by Lukman et al. who stated that video is a good learning media that helps the students to absorb the material because it provides them audio visual, pictures, and sound in one unit at the same time (Lukman et al., 2019). However, the teacher also needs to pay attention to the video's duration to prevent too long video duration, boredom, and ineffective class. According to this, to limit the video's duration, the teacher needs to combine the video and the microlearning. Microlearning manifests as an ideal solution for the newest learning instruction because it characterizes as a brief, transparent, and combination from the chunks of flexible learning content. This method prioritizes the process of science construction and the students' experience which can be simply implemented. Microlearning consumes a brief time in the process of learning, which emphasizes a specific learning objective and conceptual because this learning owns a detailed learning objective towards the desired performance (Ariantini, 2019; Surahman et al, 2020). This is in line with the research revealed by Giurgiu, which revealed a learning content in chunks successfully helps the students memorize the material. Therefore, microlearning passively influences the students' learning style in this digital era (Giurgiu, 2017).

In its implementation, the use of learning media does not maximally used as a facility in learning Science. According to the observation and interview result on Tuesday, February 4th 2020 towards the Science's teacher, Drs. Made Gatotkaca, there were some issues identified in SMP Negeri 2 Singaraja. They were (1) the lack of students' ability to absorb a science lesson and influence their comprehension of the lesson. This issue was proved by the invention of the low students' exam results shown by the students in class VII, in which those scores did not hit the minimum criteria of completeness that sat in a score of 75. (2) The learning instruction still implemented teacher-centered, which encouraged the students to be passive and finally encountered some difficulties in the learning process, such as problem-solving and answering the questions. (3) The lack of learning sources, (4) a poor learning result in SMP 2 Singaraja shown by the low of science scores that at in the score of 42. (5) LKS and school books did not provide the students much information and did not help the students in the process of learning because the students needed to be mentored and supervised by the teachers to clarify the material given in the textbook plus the nowadays students were not accustomed to much reading habit. (6) A vague teachers' explanation which was caused by the irrelevant teaching sources, that influences the students' absorption towards the material given and abstract comprehension. (7) Many teacher agendas limited the students' creativity to take a longer time to create an effective teaching media. (8) A lack of students' interest in participating in the learning and teaching instruction, (9) a limited amount of teachers who were competent to make appropriate and engaging teaching media, so it influenced its users in SMPN 2 Singaraja.

These issues need to be handled with an appropriate solution to avoid bigger problems. Effective teaching media is considered the right solution to overcome the issues to help the teachers in the teaching instruction and increase the students' learning achievement specifically in science course. The students in the primary school are the best participants to start implementing such an effective learning media (Ariantini, 2019). This is seen from their characteristic, in which the students that belong to the level of primary school are categorized in the transition stage from child to teenager. As a result of this stage, the teacher needs to design a creative and effective teaching media to increase the students' motivation and learning achievement in the classroom.

Based on this phenomenon, it is really important to conduct an accurate analysis towards the factors that trigger the students' low learning outcome on the science lesson. Learning media is divided into three major parts: visual media, audio media, and audiovisual

media (Nurhayati, 2015; Rosa, 2015). By employing video, the students are able to observe a real object that will stimulate the students' motivation during the class (Purbayanti et al, 2020). Besides, the use of video is able to give the students a unique interest with the concrete visualization concept and animation. To transfer the clear learning message, it required an assessable video for the students to help the students comprehend the material given.

According to the observation and interview conducted, the learning media is required to be developed to improve the students' interest in learning Science. One of the factors is the teacher's lack of opportunity for the students to engage and enhance their critical thinking ability. Several researches conducted the similar thing in terms of the students' interest in using learning media. Ariantini in her research revealed the result of personal test with an excellent qualification (92.6%), the test result of the small group with an excellent qualification (90.9%), and field test result with an excellent qualification (91,02%) (Ariantini, 2019). Besides, Surahman et al., revealed the result of his research, which showed the result of individual test with a very worthy qualification (90%), testing result towards the small group with a very worthy qualification (90%), and field testing result with a very worthy qualification (91%) (Surahman et al., 2020).

This study aims to analyze and develop instructional video products based on the principles of microlearning in Science subjects.

Methods

The development of learning media based on the micro learning principles used the model of ADDIE with Analyse, Design, Development, Implementation, and Evaluation steps (Sugiyono, 2012; Tegeh & Jampel, 2017). This model was chosen based on the systematic stages and easily understood, in which this is a theoretical-based learning design. There are five stages of ADDIE model, namely analysis, design, development, implementation, and evaluation. This research and development was conducted in SMPN 2 Singaraja by participating the students in grade VII at even semester. The process of data collection used observation method, interview, document note, and questioner. The observation is a direct observation to collect the data in the real field, such as the school environment, facilities, and students' learning process. The interview was conducted to gather the information to be used as fundamental data for the research, such as the issues in the field and then recorded/noted. The document record was used to collect the information or the data about the grade VII students' skill and knowledge in SMP at even semester, 2019/2020. After the data were collected, the questioners are spread to acknowledge the students' characteristics and measure their products' worth developed by the learning content experts, learning design expert, learning media expert, individual testing, and small group testing.

The developed instruments have consisted of learning content expert instrument, learning design expert, learning media expert, personal testing, and small group. After the experts reviewed the instrument, the result of content validity was obtained. The instrument's outline of learning design is presented in Table 1.

Table 1. Learning Design Expert Instrument's Outline

| No | Aspect | Indicator | Total Item |
|----|------------|--|------------|
| 1 | Media | a. The title suitability with the learning video b. The target clarity c. The discussion clarity | 3 |
| 2 | Competency | a. The learning objective suitability with the ABCD format | 2 |

| No | Aspect | Indicator | Total Item |
|--------------|------------|---|------------|
| 3 | Method | b. The learning objective suitability with the learning indicator | 3 |
| | | a. Perception suitability with the material | |
| 4 | Material | b. The case clarity | 3 |
| | | c. The material presentation | |
| | | a. Provides the students accessible material | |
| 5 | Evaluation | b. Increase the students' attention on the learning. | 1 |
| | | c. Video motivates the students | |
| | | a. The test suitability with the given material | |
| Total | | | 12 |

The instrument's outline of learning content expert in research and video learning development is presented in Table 2.

Tabel 2. Learning Content Expert Instrument's Outline

| No | Aspect | Indicator | Total Item |
|--------------|------------|---|------------|
| 1 | Curriculum | a. Learning objectives' suitability with the learning indicator | 3 |
| | | b. Indicator's suitability with the basic competency | |
| | | c. Learning objectives' suitability with the ABCD format | |
| 2 | Material | a. Material's suitability with the learning objectives | 5 |
| | | b. The employed pictures' suitability in the material presented. | |
| | | c. The material scope's suitability with the students' characteristics. | |
| | | d. The coherent material | |
| | | e. The depth of material presented | |
| 3 | Language | a. The language use clarity | 2 |
| | | b. The language used suitability | |
| 4 | Evaluation | a. The question difficulty level | 2 |
| | | b. The question's suitability with the learning objectives. | |
| Total | | | 12 |

(Prawiradilaga, 2015)

The instrument's outline of learning media expert in this research and video learning development is presented in Table 3.

Tabel 3. The Instrument's Outline of Learning Media Expert

| No | Aspect | Indicator | Total Item |
|----|------------|---------------------------------------|------------|
| 1 | Appearance | a. Media attractiveness | 9 |
| | | b. Presenter's voice quality | |
| | | c. Picture quality | |
| | | d. Music quality | |
| | | e. Presented animation attractiveness | |

| No | Aspect | Indicator | Total Item |
|----|------------|---|------------|
| 2 | Text | f. Presented picture attractiveness | 3 |
| | | g. The accuracy of the visualization with the material | |
| | | h. The proportion's suitability with the colour variation | |
| 3 | Learning | i. Color attractiveness | 4 |
| | | a. The font's suitability used | |
| | | b. The font size accuracy | |
| 4 | Curriculum | c. The text clarity | 1 |
| | | a. Media suitability with the students' characteristic | |
| | | b. The creativity in presenting some messages | |
| | | c. The material convenience | |
| | | The duration's suitability with the script | |
| | | Total | 17 |

(Sudatha & Tegeh, 2015)

The instrument's outline of individual testing and small group testing in this research and video learning development is presented in Table 4.

Tabel 4. The Instrument's Outline of Individual Testing and Small Group Testing

| No | Aspect | Indicator | Total Item |
|----|------------|--|------------|
| 1 | Curriculum | a. Media attractiveness | 9 |
| | | b. Presenter's voice quality | |
| | | c. Picture quality | |
| | | d. Music quality | |
| | | e. Presented animation attractiveness | |
| | | f. Presented pictures attractiveness | |
| | | g. The accuracy of visualization with the material | |
| | | h. The proportion's suitability with the color variation | |
| | | i. The colour attractiveness | |
| 2 | Text | a. The employed font's suitability | 3 |
| | | b. The font size's suitability | |
| | | c. The text clarity | |
| 3 | Material | a. The media's suitability with the students' characteristic | 5 |
| | | b. The presented material convenience | |
| | | c. The evaluation exam suitability with the learning objectives. | |
| | | d. Motivates the students to learn | |
| | | e. The presented material clarity | |
| | | Total | 17 |

(Mahadewi et al., 2012)

The data analysis is a way to seek and organize the data systematically which is obtained through interview, note field, and documentation by arranging into the category, describing into some components, synthesizing, arranging into the pattern, sorting the important data in order to be easily understood by the researcher or by the others (Putra et al., 2014; Sugiyono, 2012). The employed analysis method in this current research and development was descriptive qualitative analysis and descriptive quantitative analysis.

Descriptive qualitative is defined as the research design that the data analysis is in form of sentences and words by systematically arranging the data to draw the conclusion. Meanwhile, descriptive quantitative is the data analysis in the form of comment, suggestion, and feedback from the expert based on the product validity test and based on the individual testing and small group testing. The quantitative descriptive method is conducted by arranging the data structurally in the form of number and percentage related to the certain object so that the conclusion can be drawn.

Results and Discussion

Result

This current research and development discussed major things; (1) described the development of learning video based on micro-learning principle, and (2) described the validity result of video learning based on micro-learning principle. The development of learning video based on micro-learning principle used ADDIE developing model, which was consisted of five stages. The first stage was analyzing. In this stage, a thorough observation was conducted, spread the questionnaire to the students, conducted an interview with the teachers related to the classroom issues faced by the teacher in the classroom instruction such as learning facilities, learning process, and its relationship towards the students' characteristic. The second stage was designing. In this stage, the media design that would be developed was conducted which was consisted of lesson plan, flowchart, storyboard, and assessment instrument used as a base to develop the learning video. Besides, in this stage, the researcher also chose the appropriate software to generate the learning video, such as adobe photoshop CS6, adobe illustrator 2019, adobe after effect CC 2017, adobe premiere CC 2019, and adobe audition CC 2019. The third stage was development. In this stage, the product designing was conducted. The product was designed into the real product in the form of a learning video and based on the flowchart and storyboard design developed using selected software. The fourth stage was implementation. This stage conducted a media implementation, which was proposed to test the product validity that had been developed. The product validation involved some reviews from the learning content expert, learning design expert, learning media expert, individual testing, and small group testing. The last stage was evaluation. This stage assessed the developed learning video, in which in every stage of learning video development, there were some evaluations and revisions conducted to accomplish the final developed product. The assessment used in this evaluation was a formative assessment that was conducted during the process of product development.

The result of learning video validity based on the micro-learning principle was determined by the evaluation result from the learning content expert, learning design expert, learning media expert, individual testing, and small group testing. The evaluation results from the experts and testing subjects were analyzed descriptively by calculating the average score. In detail, the result of learning video validity based on the micro-learning principle is presented in Table 6.

Tabel 6. Product Validity Testing's Result

| No | Testing Subjects | Validity Result | Description |
|-----------|------------------------------|------------------------|--------------------|
| 1 | Learning Content Expert Test | 95% | Excellent |
| 2 | Learning Design Expert Test | 95% | Excellent |
| 3 | Learning Media Expert Test | 91,6% | Excellent |
| 4 | Individual Testing | 98,4% | Excellent |
| 5 | Small-Group Testing | 97,5% | Excellent |

According to the data presented above, it can be revealed that the learning media based on the micro-learning principle had an excellent validity, in which this result was able to help the students in the science learning process and simplify the teacher in presenting the learning material. The result of product validity on learning content expert, learning media expert, learning design expert, individual testing, and small-group testing obtained some comments and suggestions. The entire comment and guidance would be the fundamental material to revise and would be followed-up to simplify the product. The comments and advice given by the experts of learning design are presented in Table 7.

Tabel 7. Product Improvement of Learning Design Expert

| No | Comments and Suggestion | Revision |
|----|--|--------------------------------|
| 1 | In general, the video is excellent | - |
| 2 | The video guidance is required | Create a guidance book |
| 3 | Require to include learning indicators and objectives as well as the exam. | Provided in the guidance book. |

Based on the comments and suggestions given by the learning content experts, it was conducted some revisions and successfully followed-up to simplify the product based on the micro-learning principle that had been developed. Comments and suggestions given are presented in Table 8.

Table 8. Product Improvement by Learning Content Expert

| No | Comments and Suggestion | Revision |
|----|---|---|
| 1 | Replace the video background to contrast the presenter's hair | Change the background color to make it contrast with the presenter's hair |

Based on the comment and suggestion given by the learning media expert in table 8, it was already conducted a revision and followed-up to simplify the product in the form of a learning video based on micro-learning that had been developed. The comments and suggestions given by the learning media expert are presented in Table 9.

Tabel 9. Product Improvement by Learning Media Expert

| No | Comments and Suggestion | Revision |
|----|--|--|
| 1 | Use a serif type of text. | Successfully replaced with serif type of text |
| 2 | Stage the presenter on the right side while explaining the material. | Successfully staged the presenter on the right side. |
| 3 | Focusing the animation. The animation can be completed by the presenter's voice, and the presenter's face can be hidden. | Successfully zoomed to focus on the animation/material. |
| 4 | Conclusion in every video is required. | It was added conclusion. |
| 5 | The supervisor's name requires to be listed on the credit card. | Already added by supervisor's name on the end of the credit card. |
| 6 | Provide the authentic example in the abstract material, such as using a video | Successfully added bt picture on the empty/abstract slide and sources. |

| No | Comments and Suggestion | Revision |
|----|--|--|
| | or picture to illustrate some disasters (earthquake, eruption, etc.) and put the sources | |
| 7 | On the eruption video in minutes of 01.49, the text is difficult to read and simplified. | Successfully simplified the text in the minute of 01:49. |

The result of learning video product development based on the micro-learning principle is presented in Figure 1, 2, and 3.



Figure 1. Beginning Slide



Figure 2. Content Slide

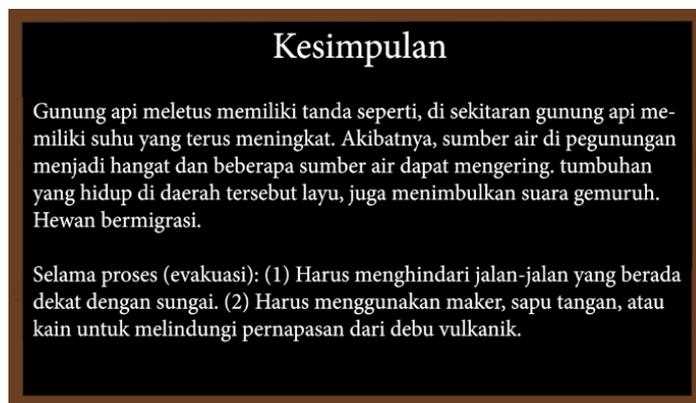


Figure 3. Conclusion Slide

Discussion

This current research was research and learning video development based on the micro-learning principle on the grade VII's lesson, which aimed at increasing and improving the students' motivation in the learning and teaching instruction and increasing the students' learning achievement and helping the teacher to develop their teaching activities. This study passed some development stages, validated by some experts in their field, and tested. The development process of this learning video employed ADDIE model which is consisted of 1) Analyzing, 2) designing, 3) developing, 4) implementing, and 5) evaluating. This model was used because of its comfortable and systematic development steps, so it suitable for the learning design that was being developed. The ADDIE model is the most generic learning design, systematically developed and theoretical- base on learning design (Tegeh & Kirna, 2013).

Some aspects influenced the learning video's validity result, namely, learning content, learning design, and learning media. If It was seen from the learning content aspect, this learning video belonged to the excellent validity of quality. This excellent validity of quality was influenced by the suitability of the material presented with the basic competency formula, indicator, and learning objectives. This was proven by the expert's assessment result of learning content towards the instrument item about the material suitability with the competencies formula, indicator, and learning objectives, which its percentage of 95% with excellent criteria. A similar thing was also shown by the assessment given by the students on the individual testing and small-group towards instrument item about material suitability with the percentage of 98,4% and belonged into excellent criteria on the individual testing and excellent criteria (97.5%) on the small-group testing. Therefore, it can be concluded that the presentation of material on the video learning based on the micro-learning was suitable with the demand of basic competence, indicator, and learning objectives that were required to be achieved by the students. This is in line with some previous study that stated the learning process' effectiveness is defined as a realization of learning outcome that was suitable with the learning objectives (Yogiyatno, 2013; Yulisa et al., 2020). A learning outcome is a final evaluation from the process and repeated introduction which is saved in a long period or immortal. This is because a learning outcome contributes and encourages the students to build a high motivation student that influence their mindset into the better version and creates a better working attitude (Sjukur, 2015).

Based on the learning design aspect, video learning based on micro-learning principle sat on the excellent validity. This excellent validity qualification was influenced because learning videos based on the micro-learning principle stimulated the students' interest and participation. This was proven by the learning design expert's assessment result on the instrument's item using a learning video based on the micro-learning principle, which was shown at the percentage of 95% with an excellent qualification. Besides, the given assessment from individual and small-group testing towards instrument's items about animation's suitability on learning video helped the students understood the material. The percentage obtained was 98.4%, with excellent criteria for individual testing and excellent criteria (97.5%) on small-group testing. Therefore, it can be inferred that the employment of learning video based on the micro-learning principle stimulated the students' participation and interest in comprehending the material given. This is in line with previous study, who stated that the use of animation could deliver a complicated concept, attract the students' attention, increase motivation, stimulate thought, better message delivery, and can be used as a media in online learning (Nurhayani, 2015). Video is a moving and noised picture. It helps the students comprehend the material, prevents students from boredom, and improves their concentration on the displayed video (Fadhli, 2015; Yulisa et al, 2020).

In terms of the learning media aspect, learning video based on the micro-learning principle sat on excellent validity. This was influenced by visual suitability to clarify the learning material. This was proven from the assessment result given by the learning media's expert on the instrument's item related to visual suitability, which its percentage was 91.6% with an excellent qualification. The obtained assessment from the individual testing towards the instrument's item was 98.4% with excellent criteria and 97.5% from the small-group testing with excellent criteria. Therefore, it can be concluded that the aspect of visual in learning video was able to clarify the learning material and help the students to comprehend the material presented. This is in line with previous study who stated that abstract and long description is more straightforward to be understood if it is visualized with some pictures because the picture helps the students to memorize messages (Putri et al., 2019; Mahadewi et al., 2012). Besides, the use of picture in the learning instruction was able to concrete an abstract concept, increase motivation, and improve students' learning achievement (Rosnihayati, 2017; Yolanda et al., 2019). Finally, students were more motivated to learn by using learning video rather than text (Fadhli, 2015; Purbayanti et al., 2020).

Conclusion

Based on the result of the research, it can be concluded that the video implementation process based on the micro-learning principle was able to increase the students' learning outcome. The implication of this current research was able to enhance the students' enthusiasm and increase the students' comprehension during the learning instruction and increase the students' learning motivation. Learning video-based micro-learning principles was appropriate for the learning process in grade VII on science lesson at SMPN 2 Singaraja so that the faced learning issues could be well solved and handled. After this current research was conducted, the researcher proposes some suggestions for the students, teacher, and other researchers. For the students, this researcher's result is suggested to be implemented as a flexible learning media and sources because it can be used everywhere and anytime. It is expected that this developed learning media can help the students to improve their learning outcomes. For the teacher, the development result of this learning video can be employed as a learning media in the teaching and learning instruction, which is able to increase the students' motivation in learning and enhance the students' deep and quicker comprehension towards the learning process in order to improve the students' interest and create an effective learning activity. Finally, for the other researcher, this result of this current research can be used as a reference to conduct further similar research, which is more interesting and innovative.

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), 19-23. <https://doi.org/10.19184/jukasi.v5i1.8010>
- Ariantini, D. (2019). Pengembangan Animasi Pembelajaran Berbasis *Microlearning* Pada Kelas III Sekolah Dasar Mutiara Singaraja Tahun Pelajaran 2018/2019. *Jurnal EDUTECH Undiksha*. 7(1), 23-32. <http://doi.org/10.23887/jeu.v7i1.19973>
- Fadhli, M. (2015). Pengembangan Media Pembelajaran Berbasis Video Kelas IV Sekolah Dasar. *Jurnal Dimensi Pendidikan dan Pembelajaran*. 3(1), 24-29. <https://doi.org/10.24269/dppv3i1.157>
- Giurgiu, L. (2017). Microlearning an Evolving Elearning Trend. *Scientific Bulletin*, 22(1), 18-23. <https://doi.org/10.1515/bsaft-2017-0003>

- Hamdanillah, N., Harjono, A., & Susilawati, S. (2017). Pengaruh Model Pembelajaran *Advance Organixer* Menggunakan Video Pembelajaran Terhadap Hasil Belajar Fisika Peserta Didik Kelas XI. *Jurnal Pendidikan Fisika dan Teknologi*, 3(2), 119-127. <http://dx.doi.org/10.29303/jpft.v3i2.358>
- Herayanti, L., & Safitri, B. R. A. (2019). Pembelajaran Mendesain Rumah Menggunakan Media Audio Visual Dengan Memanfaatkan Bandicam. *Jurnal Pendidikan Fisika dan Teknologi*, 5(2), 305-309. <http://dx.doi.org/10.29303/jpft.v5i2.1429>
- Lestari, W., & Zulmiyetri, Z. (2019). Meningkatkan Kemampuan Membaca Kata Melalui Media Video Pembelajaran Bagi Anak Tunarungu. *Jurnal Penelitian Pendidikan Khusus*, 7(1), 71-76. <http://ejournal.unp.ac.id/index.php/jupekhu/article/view/103014>
- 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), 153-166. <https://doi.org/10.32332/elementary.v5i2.1750>
- Mahadewi, L. P. P. et al. (2012). *Media Video Pembelajaran*. Undiksha Press.
- Manzilina, F., Listiawati, E., & Wijayanti, R. (2020). Pengembangan Media Videoscribe Pada Materi Sistem Persamaan Linier Dua Variabel (SPLDV). *Jurnal Ilmiah Pendidikan Matematika*, 5(2), 185-199. <https://doi.org/10.26877/jipmat.v5i2.6624>
- Nurhayani, D. (2015). Pengaruh Media Animasi Terhadap Hasil Belajar Konsep Sistem Peredaran Darah Manusia Siswa Kelas VIII MTs Raudhatul Jannah Palangkaraya. *Edusains*, 3(2), 125-140. <https://doi.org/10.23971/eds.v3i2.336>
- Pratiwi, R., Hikmawati, H., & Gunada, I. W. (2019). Pengaruh Model Pembelajaran *Probing Prompting* Berbantuan Video Terhadap Hasil Belajar dan Kemampuan Berpikir Kritis Peserta Didik. *Jurnal Pendidikan Fisika dan Teknologi*, 5(2), 213-220. <http://dx.doi.org/10.29303/jpft.v5i2.1207>
- Prawiradilaga, D. S. (2015). *Prinsip Desain Pembelajaran (Instructional Design Principles)*. Prenadamedia Group.
- Purbayanti, H. S., Ponoarjo, P., & Oktaviani, D. N. (2020). Analisis Kebutuhan Video Pembelajaran Matematika Pada Pandemi Covid-19. *Jurnal Ilmiah Pendidikan Matematika*, 5(2), 165-172. <https://doi.org/10.26877/jipmat.v5i2.6693>
- Putra, I. G. L. A. K., Tastra, I. D. K., & Suwatra, I. I. W. (2014). Pengembangan Media Video Pembelajaran Dengan Model ADDIE Pada Pembelajaran Bahasa Inggris di SDN 1 Selat. *Jurnal Edutech Universitas Pendidikan Ganesha*, 2(1). <http://doi.org/10.23887/jeu.v2i1.3939>
- Putri, N. M. L. K., Parmiti, D. P., & Sudarma, I. K. (2019). 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 Universitas Pendidikan Ganesha*, 7(2), 81-89. <http://doi.org/10.23887/jeu.v7i2.23162>
- Rosa. F. O. (2015). Pengembangan Modul Pembelajaran IPA SMP Pada Materi Tekanan Berbasis Keterampilan Proses Sains. *Jurnal Pendidikan Fisika*. 3 (1). 49-63. <http://doi.org/10.24127/jpf.v3i1.21>
- Rosnihayati. (2017). Penggunaan Media Gambar untuk Meningkatkan Hasil Belajar IPS Siswa Kelas II SDN 03 Pagaran Tapah Darussalam kabupaten Rokan Hulu. *Primary:*

- Jurnal Pendidikan Guru Sekolah Dasar*. 6(1), 306-313.
<http://doi.org/10.33578/jpfkip.v6i1.4110>
- Sjukur, S. B. (2012). Pengaruh Blended Learning Terhadap Motivasi Belajar dan Hasil Belajar Siswa Tingkat SMK. *Jurnal Pendidikan Vokasi*. 2(3), 368-378.
<https://doi.org/10.21831/jpv.v2i3.1043>
- Sudatha, I. G. W. & Tegeh, I. M. (2015). *Desain Multimedia Pembelajaran*. Media Akademi.
- Sugiyono. (2012). *Metode Penelitian Kuantitatif, Kualitatif, dan R & D*. Alfabeta.
- Surahman, E., Sulthoni, S., Ulfa, S., Husna, A., Ramdiana, H., Thaariq, Z. Z. A., ... & Qolbi, M. S. U. (2020). Pelatihan *Microlearning Object* Berbasis Tpack Bagi Guru-guru SMA di Garut. *Jurnal Ilmiah Pengabdian Kepada Masyarakat*. 3(2), 1-14.
<http://doi.org/10.17977/um050v3i1p1-14>
- Tegeh, I. M. & Jampel, I. N. (2017). *Metode Penelitian Pengembangan*. FIP Undiksha.
- Tegeh, I. M. & Kirna, I. M. (2013). *Pengembangan Bahan Ajar Metode Penelitian Pendidikan Dengan ADDIE Model*. 11(1), 12-26.
<http://doi.org/10.23887/ika.v11i1.1145>
- Wahyu, Y., Edu, A. L., & Nardi, M. (2020). Problematika Pemanfaatan Media Pembelajaran IPA di Sekolah Dasar. *Jurnal Penelitian Pendidikan IPA*. 6(1), 107-112.
<https://doi.org/10.29303/jppipa.v6i1.344>
- Yogiyatno, W. (2013). Pengembangan Multimedia Interaktif Kompetensi Dasar Mengoperasikan Software Basis Data untuk SMK Negeri 1 Seyegan. *Jurnal Pendidikan Vokasi*, 3(3), 391-404. <https://doi.org/10.21831/jpv.v4i1.2539>
- Yolanda, S. E., Gunawan, G., & Sutrio, S. (2019). Pengaruh Model Pembelajaran Inkuiri Terbimbing Berbantuan Video Kontekstual Terhadap Penguasaan Konsep Fisika Peserta Didik. *Jurnal Fisika dan Teknologi*, 5(2), 341-347.
<http://doi.org/10.29303/jpft.v5i2.1393>
- Yulisa, Y., Hakim, L., & Lia, L. (2020). Pengaruh Video Pembelajaran Fisika Terhadap Pemahaman Konsep Siswa SMP. *Jurnal Luminous: Riset Ilmiah Pendidikan Fisika* 1(1), 37-44. <http://doi.org/10.31851/luminous.v1i1.3445>.