***JKPK (JURNAL KIMIA DAN PENDIDIKAN KIMIA)**, Vol. 6, No. 2, 2021* *pp. 163-172*
Chemistry Education Study Program, Universitas Sebelas Maret *ISSN 2503-4146*
https://jurnal.uns.ac.id/jkpk *ISSN 2503-4154 (online)*

DEVELOPING ANIMATION VIDEO-BASED DEMONSTRATION EXPERIMENTS ON THE TOPIC SOLUBILITY AND SOLUBILITY PRODUCT

Marlina*, Riyanto

Department of Chemistry Education, Universitas Islam Indonesia,
Jl. Kaliurang Km. 14,5 Sleman Yogyakarta Indonesia 55584 Indonesia

* correspondence, tel/fax: 082329118270, email: marlina0177pasca.2019@student.uny.ac.id

Received: April 10, 2021 Accepted: August 17, 2021 Online Published: August 25, 2021
DOI : 10.20961/jkpk.v6i2.52044

ABSTRACT

Education in the 21st century is learning to prepare a generation that prioritizes advances in information and communication technology (ICT) as a medium for students to develop products in the form of animated videos, demonstrations and experiments. This study aims to produce valid, interesting, and effective learning media. This research is an ADDIE development research with five stages: analysis, design, development, implementation, and evaluation. The subjects in this study were three high school students with 60 students and three teachers and two validators—data collection instruments in questionnaires and tests. The data analysis technique in this research and development is a descriptive statistical analysis technique of percentages to process data from the validator's assessment, student responses and test results. Qualitative descriptive describes data in the form of suggestions and comments from the validator. The animation video media validation results obtained an average score of material expert validation, and media expert validation obtained a percentage of 84%, classified as very good. The results of the student response questionnaire to the learning media obtained a percentage of 86% with an exciting category. Finally, the test results obtained 100% results with effective criteria where all students met the minimum standard of completeness set by the school, namely 76 for chemistry subjects.

***Keywords**: Demonstration Experiments, animation video, solubility and solubility product.*

INTRODUCTION

Regarding the development of the era, interactive and innovative learning is needed as one of the attractive factors for achieving the teaching and learning goals in the school. One of the advantages of using technology in the field of education is developing the learning media. Technology plays a role and has a significant impact on education, since information technology can be developed rapidly [1], [2], and using technology as a learning medium can have an effective impact [3], especially for enhancing the learning effectiveness as an interaction between students and the learning context [4]-[6]. For its use as learning media, multimedia has several advantages in educational technology, such as for learning videos and computer-assisted learning media. The application of multimedia in learning can use a gadget or computer

assistance [7] since multimedia learning use aimed to support the learning process [8]. Media is one of the essential components to successfully learning [9], such as textbooks, student worksheets, e-books, macromedia flash, animation videos, and teaching aids. Learning media can increase students' interest in learning [10] and visuals, audio, and audiovisuals. Learning media can be used as an alternative learning resource in the learning process [11]. One of the audio-visual media is animation video, which has developed in various subjects.

Video is a medium that has multiple uses in the learning process [12]-[13], and it can attract the students' interest. It supports the students in learning the content based on their own proficiency [14] and provides a flexible learning environment where students can play, pause, and replay the learning content [15]. Animation media contain words, images, sounds, images, and moving images (animation) [16]-[17]. The development of animation videos enables the teachers to interact with students in reviewing the learning subjects. The application of multimedia technology aimed to develop more active, interactive, and quality learning, such as providing students with a more complete and more flexible learning environment, to be able to build students' motivation and interest, increase the knowledge and the quality of learning system, and help students to understand the [18], [19], [28], [29], [20]–[27].

The previous research and development which resulted in a feasible, practical and effective learning medium are: the development of video-based chemistry learning media; the development of android-based chemistry learning media; the development of powtoon-based video media in science; the development of learning video media with 4D development model on Hindu religious subjects; and the development of animated video-based learning media using inquiry learning models [30]–[34]

According to [35], a teaching content that combines verbal (words and sounds) and visual (images and animation) information is better than visual content (text and images) since it stimulates two sensory channels [36]. The learning process, especially in the Chemistry subject, is getting challenging every day since the 21st century goal is to conduct Chemistry learning involving creativity in deciding the learning model [37]. chemistry includes theoretical and mathematical understanding that requires complex understanding [38].

Previous research and development, this study makes a novelty in developing a learning media, such as developing a learning media using Demonstration and Experiment in the form of animation video, which is feasible and has a good quality to be used in the learning process. The learning media presented in the topic of solubility and solubility product learning using Sparkol VideoScribe contains applicable and contextual material related to the environ-ment and laboratory practice, animation, learning videos, text, and music produce interesting learning media. and to build students' interest in learning, and improve their understanding. Research and development were carried out to determine

the learning media's feasibility, practicality, and effectiveness.

METHODS

This research was conducted using the Research & Development (R&D) method. The procedure for developing learning media in this study uses the ADDIE development model developed by Reiser and Mollenda, consisting of the Analysis, Design, Development, Implementation, and evaluation stages. According to [39], the ADDIE model is better used for large-scale research but can also be used in small-scale research. Sampling using a purposive sampling technique. The subjects in this study were 60 high school students and three teachers, and two validators. The instrument of data collection was using a feasibility question-naire sheet and the attractiveness of student responses to the resulting learning media and tests to determine the effectiveness of the resulting product. The data analysis technique in this research and development is a descriptive statistical analysis technique of percentages to process data from the validator's assessment, student responses and test results. In contrast, qualitative descriptive describes the data as suggestions and comments from the validator for improvement.

The first stage of this research is a preliminary study by distributing question-naires, interviews and observations to determine the needs of students in the classroom, teaching materials and learning models used in the teaching process in schools. The information obtained will meet the needs of students in class. The second stage is the development of demonstration animation videos and experiments. The video animation demonstrations and experiments that were developed have a role in real understanding of simulations in learning, increasing student activity, motivating and fostering student interest in learning and increasing student understanding. In developing this video, each student can do experimental activities independently or in groups. This animated learning video presents activities carried out by students using the knowledge learned by students by providing problems to be done [40]. The last stage in this study was to determine the effectiveness of the use of learning animation videos. This stage aims to determine the classical effectiveness of student learning success using the developed learning animation videos.

The procedures in developing animation video-based demonstration experiments by using the ADDIE model [41] are presented in Figure 1:

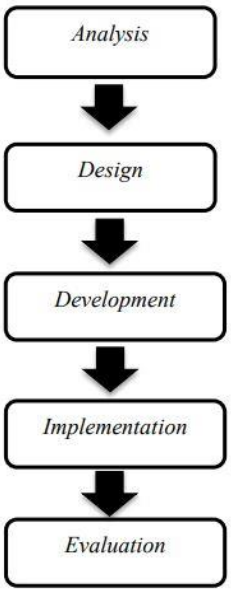


Figure 1. The stages of developing ADDIE

RESULTS AND DISCUSSION

1. Analysis

The analysis stage was implemented to get more knowledge related to the product. The identification of the analysis consists of curriculum, core competence, basic competence, indicator, learning content, students' characteristics, the condition and situation of the school, and the components of the product. The results of the study were used to make the product or the learning media. The instruments used in collecting the information were questionnaires related to needs analysis and interviews related to the development of animation videos in the topic g solubility and solubility products. Based on the needs analysis stage, 29 of 30 students in SMA A Sleman "like Chemistry subject", with "quite difficult" category, such as topic solubility and solubility product, and the media "has effects" on the learning process. The results of the analysis reveal that the students need learning media in the form of animation videos. In addition, the results of the need analysis and interview with the teachers reveal that animation video as a learning media in the topic solubility and solubility product has been feasible to be studied.

2. Design

The design phase of learning products' development of demonstration students of Experiments based on animated videos provides new knowledge and experiences in learning concepts and experiments related to daily life. It involves technology in the development of learning media. Animated video design includes three parts; the first part is an introduction consisting of title, character introduction, material appreciation, core competence and basic competence; the second part consists of material concepts, natural events, demonstrations and experiments in daily life; The closing section consists of material conclusions and components for making animated videos. Videos that are designed in such a way can display text, color images, audio (sound), and animation in a single animation so that they can provide a special attraction for students to learn through the presentation of audio-visual material [42]. The stage of making media using the Sparkol VideoScribe software.

3. Development

In this stage, the product is created based on the study results and the preliminary design of the learning media. The sequences of this stage are: preparing the solubility and solubility product materials, doing dubbing, creating or collecting some learning videos, creating the animation, and creating the software/multimedia program (product). The results of the learning media that had been developed are presented in Figure 2 and Figure 3.

Figure 2.Example of the content in animation video

Figure 3. Example of the content in animation video

The learning media has been validated by media experts, material experts and teachers. The assessment results of media experts and content experts determine the feasibility of learning media and guide revising the products developed. The overall assessment results by media experts, content experts and teachers were carried out on the content feasibility component, presentation component, graphic component, linguistic component, and video animation component obtained an average percentage of 84% invalid and very good criteria without an intermediate revision. Content feasibility component, from the assessment results of media experts, content experts and teachers obtained an average percentage of 87% in the valid criteria. The presentation component obtained an average percentage of 83% in the valid criteria; the graphic component obtained an average percentage of 85% in the valid criteria, the linguistic component obtained an average percentage of 82% in the valid criteria, the animation video component obtained an average percentage of 85% in the valid criteria. The following is a graph of the assessments of media experts, content experts and teachers in Figure 4.

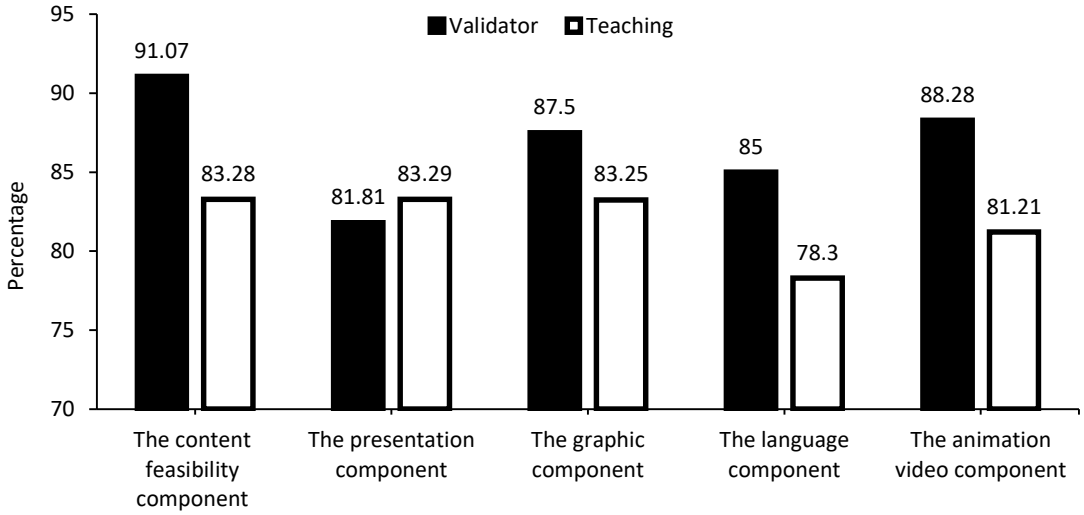
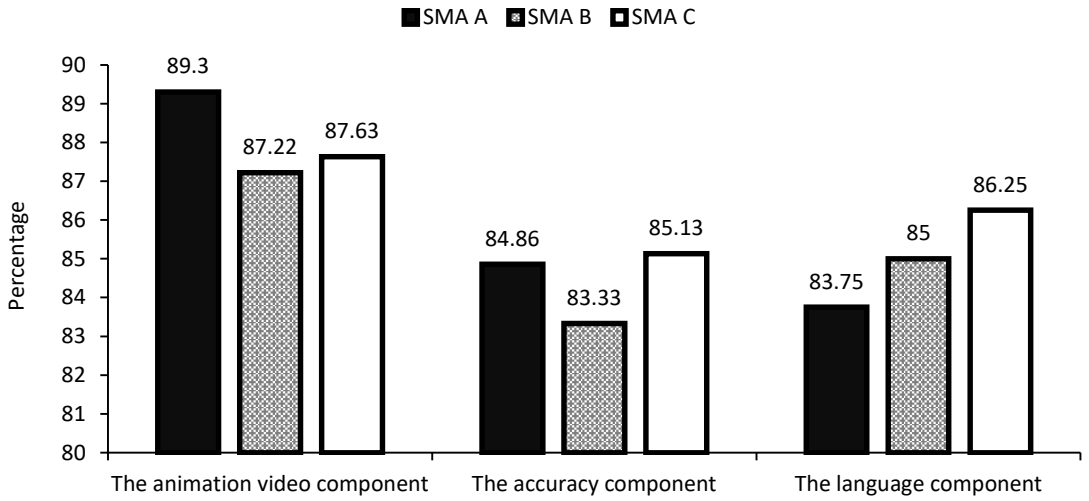


Figure 4. The percentage of the results based on validators' and teachers' assessments

The product that has been improved based on input and advice from media and content experts will be tested to determine the response of students from three high schools to the attractiveness of the developed media. The assessment of the overall student response to the animated video, concept truth, and linguistic components obtained an average percentage of 86% in the exciting category. The

assessment of the responses of SMA A students to the learning animation videos developed obtained an average percentage of 86% in exciting criteria. The assessment of the responses of SMA B students to the learning animation videos developed obtained an average percentage of 85% in exciting criteria. Finally, the assessment of the responses of SMA C students to the learning animation videos developed obtained an average percentage of 86% in very interesting criteria. The following is a graph of student responses to the learning media produced in Figure 5.



Gambar 5. The results of students' responses in SMA A, B, and C

4. Evaluation

The evaluation stage aimed to identify the product's effectiveness based on the test results conducted on the students. The test was based on the preliminary test grid. Based on the test results, it can be concluded that all of the students' scores have reached the specified minimum completeness criteria (KKM). In other words, all students have mastered the material, while the percentage of classical completeness is 100%. The product is effective, as shown the percentage of classical completeness on the test results that have exceeded the success indicator, which is as much as 76%.

Based on the research and development results obtained, it can be concluded that the learning media developed in the form of animated video learning media on the topic solubility product and solubility product are valid, interesting, and effective. The initial step that must be taken in developing learning media is to collect data such as syllabus, lesson plans, and reference books to be used and other sources. After the data is collected, the next step is to design learning media using the data that has been collected; then, the learning media that have been designed are then validated by media experts and content experts. Media that has been validated is corrected according to input from the validators. The revised learning media was then tested in three different schools through the pilot phase. The data obtained at the trial stage is used to

determine the attractiveness and effectiveness of the learning multimedia produced. After all, stages are completed, the teaching materials in the form of animated video learning media on the solubility and solubility product are valid for use in chemistry learning activities. The existence of this learning media can help students increase motivation and interest in learning in attracting students' attention [43]. Development and innovation in learning are needed to make it easier for students to understand the material to be delivered. The criteria for good learning media include compatibility with the target, relevance to the topic, and learning objectives. Produce instructional video media by the aspects of the material presented [44].

The product developed has several advantages: learning multimedia containing material with contextual applications and application in the laboratory. Students can practice their abilities in understanding the material presented in learning media and are expected to stimulate students' thinking. Animated video learning media on solubility and solubility product using Sparkol VideoScribe software that is produced contains materials, animations, learning videos, texts, and music to produce interesting, motivating, and growing learning media for students improve student understanding [45]. Learning animation video products are produced in the form of demonstrations and experiments. The animation video production process can run smoothly and systematically because it is based on a script that has been made previously, and the content collected is by the characteristics of students. The animated video product developed is then continued with the evaluation stage, validation by content experts and learning media experts and continued with student trials, small group trials and field trials. The level of validity by material and media experts reached a score of 84% with excellent qualifications. The results of the assessment carried out by students reached 86% with very good qualifications. The achievement of the category is very good because it is influenced by several factors including aspects of attractiveness and aspects of content, content in videos that are easy to understand and clear, examples used such as pictures, animated videos can provide motivation, activity, and increase student curiosity.

CONCLUSION

Animated videos are feasible, practical, and effective to be used as learning media. The feasibility of the validation results from media experts, material experts, and teachers. the score obtained from the validation is categorized as very good, the trial, student responses to the practicality of learning media are in the very practical category. the product proved to be effective because the percentage of classical completeness in the test results had exceeded the success indicator, which was 76. It is recommended that the product that has been developed can be used as an alternative medium in chemistry learning so that the learning process can be carried out in a fun way. The product or learning media can be used as a new reference to support the teaching and learning process. In addition, it is recommended to make more interesting media, especially for learning Chemistry.

REFERENCES

[1] N. Nurhasnah, W. Kasmita, P. Aswirna, and F. I. Abshary, "Developing Physics E-Module Using 'Construct 2' to Support Students' Independent Learning Skills," *Thabiea J. Nat. Sci. Teach.*, vol. 3, no. 2, pp. 79, 2020, doi: 10.21043/thabiea.v3i2.8048

[2] S. Sumarni, Jumintono, E. S. Sunarsih, Waluyo, R. W. Putri , T. L. Adisucipto, F. Umar, O. C. Wuwung, F.K. Manoppo, A. Setiawan, and J. Hos, "E-Learning through Lesson Study to Improve Learning Effectiveness," *Univers. J. Educ. Res.*, vol. 8, no. 12A, pp. 7426–7432, 2020, doi: 10.13189/ujer.2020.082526.

[3] İ. Özpınar, "Preservice Teachers' Use of Web 2.0 Tools and Perspectives on their Use in Real Classroom Environments," *Turkish J. Comput. Math. Educ.*, vol. 11, no. 3, pp. 814–841, 2020, doi: 10.16949/turkbilmat.736600

[4] F. Adnan, B. Prasetyo, andN. Nuriman, "Usability testing analysis on the Bana game as education game design references on junior high school," *J. Pendidik. IPA Indones.*, vol. 6, no. 1, pp. 88–94, 2017, doi: 10.15294/jpii.v6i1.9597

[5] H. Hsu-Wen, J.-T. King, andC.-L. Lee, "The New Science of Learning : Using the Power and Potential of the Brain to Inform Digital Learning," *Educ. Technol. Soc.*, vol. 23, no. 4, pp. 1–13, 2020.

[6] Y. Lan, "Immersion into virtual reality for language learning," in *The Psychology of Learning and Motivation*, 1 ed., vol. 72, Elsevier Inc., 2020, pp. 1–26. doi: 10.1016/bs.plm.2020.03.001

[7] Y. A. Wu, Y. Lan, S. P. Huang, and Y. R. Lin, " Enhancing medical students' communicative skills in a 3D virtual world" *Educational Technology and Society,* vol. 22, no. 4, pp. 18–32, 2019.

[8] J. C. Nwosu, H. C. John, A. A. Izang, and O. J. Akorede, "Assessment of information and communication technology (ICT) competence and literacy skills among undergraduates as a determinant factor of academic achievement," *Educ. Res. Rev.*, vol. 13, no. 15, pp. 582–589, 2018, doi: 10.5897/err2018.3539

[9] R. S. S. Aisyah, I. E. Wijayanti, and S. Aisyah, "The Quality of Selvo E-Modules as Learning Media on The Topic Of Voltaic Cells," *EduChemia (Jurnal Kim. and Pendidikan)*, vol. 5, no. 1, pp. 39, 2020, doi:10.30870/educhemia.v5i1.7218.

[10] R. K. Anggreini and N. R. Dewi, "Development of Ludo-Science Media with a Somatic Auditory Visual Intellectual (SAVI) Approach to Train the Activeness and Conceptual Understanding," *J. Penelit. dan Pembelajaran IPA*, vol. 6, no. 2, pp. 241–267, 2020, doi: 10.30870/jppi.v6i2.8677

[11] N. E. Ntobuo, A. Arbie, and L. N. Amali, "The development of Gravity Comic Learning Media Based on Gorontalo Culture," *J. Pendidik. IPA Indones.*, vol. 7, no. 2, pp. 246–251, 2018, doi: 10.15294/jpii.v7i2.14344.

[12] S. Alimah, "Pengembangan Multimedia Pembelajaran Embriogenesis Hewan untuk Mengoptimalkan Pemahaman Kognitif Mahasiswa," *J. Pendidik. IPA Indones.*, vol. 1, no. 2, pp. 131–140, 2012. doi: 10.15294/jpii.v1i2.2130

[13] H. Polat, "Investigating the Use of Text Positions on Videos : An Eye Movement Study," *Contemp. Educ. Technol.*, vol. 12, no. 1, pp. 1–18, 2020, doi:10.30935/cedtech/7628.

[14] C. Gaudin and S. Chalies, "Video viewing in teacher education and professional development : A literature review bastien Chali e s," *Educ. Res. Rev. 16*, vol. 16, pp. 41–67, 2015, doi: 10.30935/cedtech/7628

[15] J. Leo and K. Puzio, "Flipped Instruction in a High School Science Classroom," *J. Sci. Educ. Technol.*, vol. 25, no. 5, pp. 775–781, 2016, doi: 10.1007/s10956-016-9634-4.

[16] E. Howard, M. Meehan, and A. Parnell, "Live lectures or online videos: students'

resource choices in a first-year university mathematics module," *Int. J. Math. Educ. Sci. Technol.*, vol. 49, no. 4, pp. 530–553, 2018, doi: 10.1080/0020739X.2017.1387943.

[17] L.-C. Tien, C.-C. Chiou, and Y.-S. Lee, "Emotional Design in Multimedia Learning : Effects of Multidimensional Concept Maps and Animation on Affect and Learning," *EURASIA J. Math. Sci. Technol. Educ.*, vol. 14, no. 12, 2018, doi: 10.29333/ejmste/94229.

[18] C. Chiou, L. Tien, and L. Lee, "Effects on learning of multimedia animation combined with multidimensional concept maps," *Comput. Educ.*, 2014, doi: 10.1016/j.compedu.2014.09.002

[19] K. M. Oliver, "Methods for developing constructivist learning on the web," *Educ. Technol.*, vol. 40, no. 6, pp. 5–18, 2000.

[20] Muchlas, "Developing an Online Learning Media Using Smartphone for the Electrical Machinery Course," *Turkish Online J. Educ. Technol. - TOJET*, vol. 17, no. 1, pp. 62–68, 2018.

[21] K. Novitasari, E. Zubaidah, R. Harjana, and H. P. Daniswari, "Multimedia Technology to Stimulate Children' s Literacy Ability : Study in Kindergarten in Sleman," *Univers. J. Educ. Res.*, vol. 8, no. 12B, pp. 8011–8016, 2020, doi: 10.13189/ujer.2020.082601.

[22] A. S. Azar and N. H. I. Tan, "The application of ICT techs (mobile-assisted language learning, gamification, and virtual reality) in teaching english for secondary school students in malaysia during covid-19 pandemic," *Univers. J. Educ. Res.*, vol. 8, no. 11C, pp. 55–63, 2020, doi: 10.13189/ujer.2020.082307.

[23] H. B. Gündüz, "Digital divide in turkish primary schools: Sakarya sample," *Turkish Online J. Educ. Technol.*, vol. 9, no. 1, pp. 43–53, 2010.

[24] A. N. S. I. Septiani, T. Rejekiningsih, Triyanto, and Rusnaini, "Development of Interactive Multimedia Learning Courseware to Strengthen Students' Character," *Eur. J. Educ. Res.*, vol. 9, no. 3, pp. 1267–1279, 2020, doi: 10.12973/eu-jer.9.3.1267.

[25] F. T. Leow and M. Neo, "Interactive multimedia learning: Innovating classroom education in a Malaysian university," *Turkish Online J. Educ. Technol.*, vol. 13, no. 2, pp. 99–110, 2014.

[26] I. Made Rajendra and I. Made Sudana, "The Influence of Interactive Multimedia Technology to Enhance Achievement Students on Practice Skills in Mechanical Technology," *J. Phys. Conf. Ser.*, vol. 953, no. 1–5, 2018, doi:10.1088/1742-6596/953/1/012104.

[27] L. . P. D. Gunawardhana and P. S. Palaniappan, "Using Multimedia as an Education Tool," *9th Annu. Int. Conf. Comput. Games Multimed. Allied Technol. (CGAT 2016) Using*, no. APRIL 2013, pp. 98–101, 2016, doi: 10.5176/2251-1679..

[28] T. J. Wu and Y. N. Tai, “Effects of multimedia information technology integrated Multi-Sensory instruction on students’ learning motivation and outcome,” *Eurasia J. Math. Sci. Technol. Educ.*, vol. 12, no. 4, pp. 1065–1074, 2016, doi: 10.12973/eurasia.2016.1552a.

[29] M. Neo, T. K. Neo, and W. L. Yap, “Students’ perceptions of interactive multimedia mediated web-based learning: A Malaysian perspective,” *ASCILITE 2008 - Australas. Soc. Comput. Learn. Tert. Educ.*, no. 1995, pp. 658–666, 2008.

[30] S. Nusir, I. Alsmadi, M. Al-Kabi, and F. Sharadgah, “Studying the impact of using multimedia interactive programs on children’s ability to learn basic math skills,” *E-Learning Digit. Media*, vol. 10, no. 3, pp. 305–319, 2013, doi: 10.2304/elea.2013.10.3.305.

[31] R. Endriani, A. Sundaryono, and R. Elvia, “Pengembangan media pembelajaran kimia menggunakan video untuk mengukur kemampuan berfikir kritis siswa,” *PENDIPA J. Sci. Educ.*, vol. 2, no. 2, pp. 142–146, 2018, doi:10.33369/pendipa.2.2.142-146.

[32] A. Harianto, S. Suryati, and Y. Khery, "Pengembangan Media Pembelajaran Kimia Berbasis Android Untuk Penumbuhan Literasi Sains Siswa Pada Materi Reaksi Redoks Dan Elektrokimia," *Hydrog. J. Kependidikan Kim.*, vol. 5, no. 2, pp. 35, 2019, doi: 10.33394/hjkk.v5i2.1588.

[33] Y. Wulandari, Y. Ruhiat, and L. Nulhakim, "Pengembangan Media Video Berbasis Powtoon pada Mata Pelajaran IPA di Kelas V," *J. Pendidik. Sains Indones. (Indonesian J. Sci. Educ.*, vol. 8, no. 2, pp. 269–279, 2020, doi: 10.24815/jpsi.v8i2.16835.

[34] I. M. Tegeh, A. H. Simamora, and K. Dwipayana, "Pengembangan Media Video Pembelajaran Dengan Model Pengembangan 4D Pada Mata Pelajaran Agama Hindu," *Mimb. Ilmu*, vol. 24, no. 2, pp. 158, 2019, doi: 10.23887/mi.v24i2.21262

[35] N. Sya'bania, M. Anwar, and M. Wijaya, "Pengembangan Media Pembelajaran Berbasis Video Animasi dengan Model Pembelajaran Inkuiri Terbimbing untuk Meningkatkan Motivasi and Hasil Belajar Peserta Didik," *J. Chem. Inf. Model.*, vol. 4, no. 1, pp. 34–44, 2020,. doi: 10.26858/cer.v4i2.19117

[36] A. Holzinger M.*Kickmeier-Rust, & D. Albert,* "International Forum of Educational Technology & Society Dynamic Media in Computer Science Education ; Content Complexity and Learning Performance : Is Less More ? Published by : International Forum of Educational Technology & Society Stable URL : https://," *Int. Forum Educ. Technol. Soc.*, vol. 11, no. 1, pp. 279–290, 2008.

[37] U. Oktavianti, A. M. Noer, and L. Anwar S, "Development of Students Worksheet Chemical Bond Based On Learning Cycle 7E," *EduChemia (Jurnal Kim. dan Pendidikan)*, vol. 5, no. 1, pp. 51, 2020, doi: 10.30870/educhemia.v5i1.6732

[38] R. Yanto, E. Enawaty, and Erlina, "Pengembangan Lembar Kerja Siswa (LKS) dengan Pendekatan Makroskopis-Mikroskopis-Simbolik Pada Materi Ikatan Kimia," *J. Pendidik. dan Pembelajaran*, vol. 2, no. 3, pp. 1–9, 2013.

[39] W. Wyrostek and S. Downey, "Compatibility of Common Instructional Models With the DACUM Process," *Adult Learn.*, vol. 28, no. 2, pp. 69–75, 2017, doi: 10.1177/1045159516669702.

[40] A. P. Asmara, "Pengembangan Media Pembelajaran Berbasis Audio Visual Tentang Pembuatan Koloid," *J. Ilm. Didakt.*, vol. 15, no. 2, pp. 156–178, 2015, doi: 10.22373/jid.v15i2.578.

[41] B. A. Pribadi, *Desain dan Pengembangan Program Pelatihan Berbasis Kompetensi-Implementasi Model ADDIE*. Jakarta: Prenada Media Group, 2004. ISBN:978-602-7985-91-9

[42] P. J. R. Ponza, I. N. Jampel, and I. K. Sudarma, "Pengembangan Media Video Animasi pada Pembelajaran Siswa Kelas IV di Sekolah Dasar," *J. Edutech Undiksha*, vol. 6, no. 1, pp. 9–19, 2018, doi:10.23887/jeu.v6i1.20257.

[43] M. Muammar and S. Suhartina, "Media Pembelajaran Berbasis Teknologi Informasi Dalam Meningkatkan Minat Belajar Akidah Akhlak," *KURIOSITAS Media Komun. Sos. dan Keagamaan*, vol. 11, no. 2, pp. 176–188, 2018, doi: 10.35905/kur.v11i2.728

[44] E. Puspita, B. Hariyadi, and M. Muswita, "Pengembangan video mengenai mangrove sebagai media pembelajaran di Sekolah Menengah Atas (SMA) dan masyarakat di pesisir Jambi," *J. Bioedukatika*, vol. 6, no. 2, pp. 48, 2018, doi: 10.26555/bioedukatika.v6i2.8844

[45] M. S. Zaini and J. Nugraha, "Pengembangan Media Pembelajaran Multimedia Interaktif Berbasis Adobe Premiere Pro Pada Kompetensi Dasar Mengelola Kegiatan Humas Kelas XI Administrasi Perkantoran di SMK Negeri 2 Buduran Sidoarjo," *J. Pendidik. Adm. Perkantoran*, vol. 9, no. 2, pp. 349–361, 2020,