



## Development of Demonstration-Assisted Audio Visual Media to Improve Students' Critical Thinking

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### Abstract

Based on the needs analysis that was carried out in Class V SD Al-Islam Gresik, there is an obstacle that teachers have limitations in teaching, one of which is influenced by the availability of educational media that can help teachers use simple media that are located around the classroom area and have never used media. audio visual in the form of 3D in education. Based on data analysis and discussion of research results, then associated with the formulation of the problem and research objectives, the conclusion was obtained, namely media validation from the results of media experts with very good grades. The validator gives a score of 96%, meaning that audio-visual media with validation from experts is very feasible to use, material validation from the results of material experts with very good grades. The validator gives an assessment reaching 93%, meaning that audio-visual media with validation from experts is very feasible to use, the practicality of the media gets grades from the teacher in a very practical category, the teacher gives an assessment that reaches 95%, meaning that the media developed is feasible to use and very practical on a small scale because it does not require a lot of time, the practicality of the media gets value from student responses in the very practical category, students give an assessment with a 90% percentage mode, meaning that the developed media is feasible to use and is very practical on a small scale (n = 5 children) because it does not require much time. a lot, the effectiveness of the media gets a score from student responses in the very effective category, students give an assessment with a 90% percentage mode meaning that the media developed is feasible to use and very effective on a large scale (n = 10 children) because the efficiency of critical thinking in students has increased.

**Keywords:** Audio Visual, Demonstration, Critical Thinking

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## INTRODUCTION

Learning is human life as the main aspect in improving human energy sources (HR). Good learning must be carried out in a planned manner so that it can create a massive learning atmosphere and educational process and students can improve their inner abilities so that they have religious spiritual growth, self-control, character, intelligence, noble character, and skills needed for individuals in society (Langeveld in Hasbullah, 2017). The era of globalization is signaled by the correlation between technology and knowledge which continues to grow rapidly so that it has a fairly broad impact on life's problems. One result of globalization is the demand in the field of learning to create human resources that have complete competencies, known as 21st century competencies (Wijaya et al., 2016; Musahidin et al., 2022; Wirzal et al., 2022; Asy'ari & da Rosa, 2022). According to UNESCO (UNESCO, 2018) experiencing the 21st century there are 4 pillars of learning, including: 1) learning to recognize (learning to know); 2) learning to do (learning to do); 3) learning to apply oneself as a person with an independent personality (learning to be); and 4) learning to live together (learning to live together).

Critical thinking skills are needed for students to deepen the description of concepts (Suhirman & Ghazali, 2022), which consist of lower concepts, theoretical concepts, and connections between concepts. Critical thinking skills have a position in solving a case that exists, when a person is faced with a case so that people who have critical thinking skills make actions in mastering and dismantling the case (Baker, 2010; Ekayanti et al., 2022; Fitriani et al., 2022). Applicable in the case of conveying the teacher to students through the problems being tested overrides the truth of a concept from the lesson module, if students have a high level of critical thinking skills then the resulting answers are correct but vice versa if students experience difficulties in mastering the concept then the level of critical thinking skills low learners.

Innovation in educational media in THEMATIC that matches the characteristics of students in schools that teachers use educational media with equipment and materials that can be observed and heard. Audio-visual media or sensory support facilities in the study room to make it easier to master the words that are written or expressed. Students can clearly master and not just imagine what they don't know. Education in the classroom also becomes attractive to students. The use of audio visual media is needed by the teacher. The natural indication module in Indonesia and its explanation, this module in THEMATIC subjects can be taught with the support of audio-visual media that can help and facilitate teachers in sharing data and describing clear educational objects to students.

In addition to 3D Audio Visual media, researchers also use demonstration assistance in education as a support for this media in an effort to increase critical thinking in students. The educational media that researchers use is Audio Visual. This media is media that has been renewed so that it is 3D in which there is audio-visual output of sound from the media so that it has certain advantages, namely being able to stimulate creativity and increase critical thinking in students.

## **METHOD**

### **Research Design**

The development research model for theory is used as a research framework and the development of this research is the ADDIE theory (analyze, design, development, implementation, evaluation). Tegeh et al., (Tegeh et al., 2014) stated that many applications of reading development techniques, audiovisual modules, and argumentation-based education modules, systematics as a procedural feature of the systems approach have been implemented at the design and development level of educational modules. The ADDIE model is quite aligned in improving Audio Visual educational media and this development model is systematic and structured.

This study aims to identify the validity, practicality, and effectiveness of efforts to improve critical thinking skills in THEMATIC subjects. So that this research is categorized in development research. In this study, research did not distribute treatment specifically or directly to the object under study. Collaborative research with teachers for the development of demonstration-assisted Audio Visual media to improve students' critical thinking skills.

### **Data Collection Techniques**

In this study, the implementation of data collection techniques played a role in collecting objective data. The development data collection techniques compiled in this study are as follows.

### **Interview**

To produce examples that must be examined, information is collected using an interview approach. The interview, which was conducted on March 13 2023 with 2 class V teachers and the principal of SD Al-Islam Gresik, aims to uncover certain issues that require in-depth responses from respondents. Especially for class V SD Al-Islam Gresik, the intended topic is the learning media used by teachers and students during learning.

### Questionnaire

Questionnaires are used to evaluate the reliability and usability of the innovated media. Validation questionnaires and questionnaires to measure student reactions were used in this study. The validation questionnaire is used to assess the reliability of the media produced. The target population of the learning media validation questionnaire focuses on the validity, practicality, and effectiveness of the media provided. This questionnaire has standards aligned with the needs of researchers, which are showed in Table 1.

**Table 1.** validator criteria

Validator	Criteria
Media Validity	1. Media Expert 2. Material Expert
Media Practicality	1. Class V teacher 2. Students
Media Effectiveness	1. Students

The results of product validation using the criteria of 1-2 validators are then used as a standard for making adjustments to create more effective media. Student opinion surveys with a small scale of 5 students and a large scale of 10 students were used to measure how attractive the media being developed was.

### Test

The test was carried out at this stage, namely the test of students' critical thinking skills which included indicators according to Bloom which were perfected by Anderson & Krathwohl (Anderson & Krathwohl, 2001), formulated 6 levels of thinking processes, namely: Remembering, Understanding, Applying, Analyzing, Evaluating, Creating. Critical thinking tests on media are usually referred to as learning test questions with the completion of the implementation of Audio Visual media. Through evaluation questions, test questions by students over a certain period of time are measured before implementation and after implementation. In this study a test was used to assess students' critical thinking in understanding the concept of learning through Audio Visual learning media produced in addition to measuring the usefulness of the media. The effectiveness of a strategy is measured by how well the achievement of the KKM that has been set is 75 in line with the national KKM standards.

### Documentation Study

Documentation is used in taking pictures or photos in the implementation of learning or in implementing media

### Development Instruments

The purpose of using data collection instruments include: (1) Feasibility instrument for Audio Visual media in Theme 6 Learning 1. Experts consisting of learning media experts who need to validate learning media that have been made by researchers in collaboration with programmers. So that learning media is getting ready and feasible to be applied to elementary school children; (2) Instruments for the practicality of Audio Visual media use questionnaires to find out the response to the implementation of audio visual and observation sheets to observe student activities and student behavior during learning activities using audio visual; (3) Instrument for the effectiveness of Audio Visual to improve critical thinking in learning.

### Data Analysis Techniques

Information analysis activities include analysis on (a) the validity of the development of Audio Visual media for fifth grade students at SD Al-Islam Gresik which includes the criteria for media experts and material experts; fifth grade students at SD Al-Islam Gresik which includes the criteria for class V teachers & students (c) and the effectiveness of developing

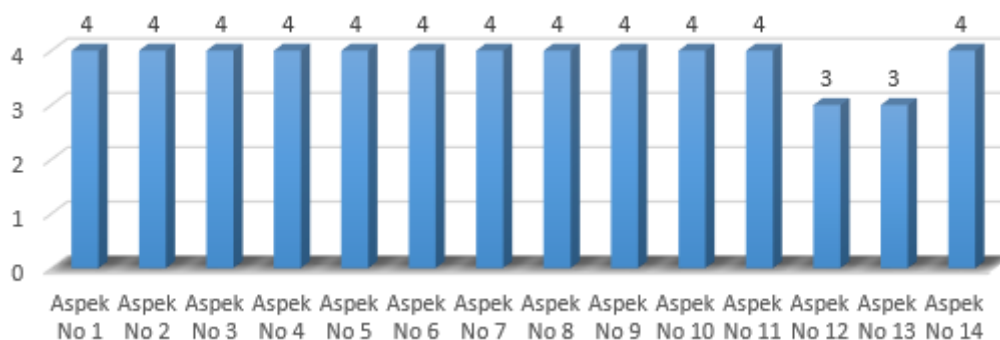
Audio Visual media to increase critical thinking for fifth grade students at SD Al-Islam Gresik which includes student response criteria.

To analyze the data in the validity of the development of Audio Visual media which is the observation of the validator, analyze with the formula: [Percentage = (The total score of the validation results/maximum score) X 100%]. It is stated with the criteria according to (Arikunto, 2013) as follows : 80% - 100% Very good (A); 66% -79% Good (B); 56% -65% Enough (C); 40% -55% not enough (D); and 0%-39% very less (E). Furthermore, Respondents' questionnaire data on the practicality of developing argumentation-based Audio visual media is analyzed using the formula:  $[P = (\sum A/B) \times 100\%]$  (Trianto, 2010) with P = Percentage of student responses;  $\sum A$  = Number of determination of the same answer; B = number of students or respondents. It is stated with the criteria according to (Arikunto, 2013). Analysis of critical thinking skills test data to find out the increase in critical thinking skills before being given treatment and after being given treatment, the gain test is used. According to Savinainen & Scott (Savinainen & Scott, 2002), the increase in pretest and posttest can be calculated using the following formula:  $\langle g \rangle = (S_{post} - S_{pre} / S_{maks} - S_{pre})$  with :  $\langle g \rangle$  = gain factor;  $S_{pre}$  = initial test average score (%);  $S_{post}$  = final test average score (%). Moreover, Gain factor classified into low ( $0 < g < 0.3$ ); moderate ( $0.3 \leq g < 0.7$ ); and high ( $0.7 < g < 1.0$ ). According to Arikunto (2013), the category of critical thinking skills is adopted from a rating scale that divides critical thinking skills into five categories, namely:  $0 \leq N \leq 39$  categories not critical;  $40 \leq N \leq 55$ : less critical category;  $56 \leq N \leq 65$ : quite critical category;  $66 \leq N \leq 79$ : critical category; and  $80 \leq N \leq 100$  very critical category. This research needs to be successful if students' critical thinking skills average value of critical thinking skills  $\geq 70$ .

## RESULTS AND DISCUSSION

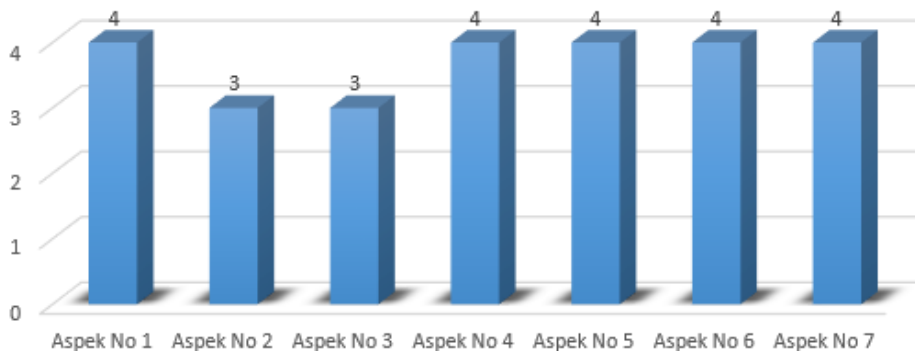
In chapter V, the results of research on Audio Visual media will be explained to improve students' critical thinking at Al-Islam Elementary School, Cerme District, Gresik Regency on the subject of human interaction with the environment. This study aims to identify the validity, practicality, and effectiveness of efforts to improve critical thinking skills in THEMATIC subjects. So that this research is categorized in development research. In this study, research did not distribute treatment specifically or directly to the object under study.

From sources that have been cited from the research of Kusni & Hendratno (Kusni et al., 2021) and Wahyunita & Subroto (Wahyunita & Subroto, 2021) with previous research that is very relevant regarding the validity of the media and material in the media requires a systematic step to achieve related eligibility with that medium. Learning media also develop every year according to the times so there needs to be motivation and innovation in the learning media that are taught. The research conducted at Al-Islam Elementary School is also different from previous research because this research uses audio-visual media and uses demonstrations to enthusiastic students in participating in learning. Based on the Figure 1, media validation from the results of media experts with very good scores. The validator gives an assessment of 14 aspects of the media with a score of 96%, meaning that audio-visual media with validation from experts is very feasible to use and can be accounted for by scientific work.



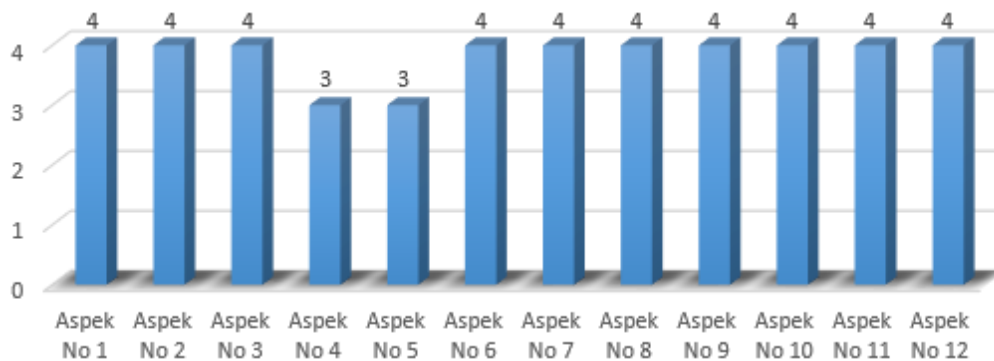
**Figure 1.** Media Validation Results

Based on the Figure 2, the validation of the material from the results of material experts with very good grades. The validator provides an assessment of 7 aspects of the material with a score of 93%, meaning that audio-visual media with validation from experts is very feasible to use and can be accounted for by scientific work.



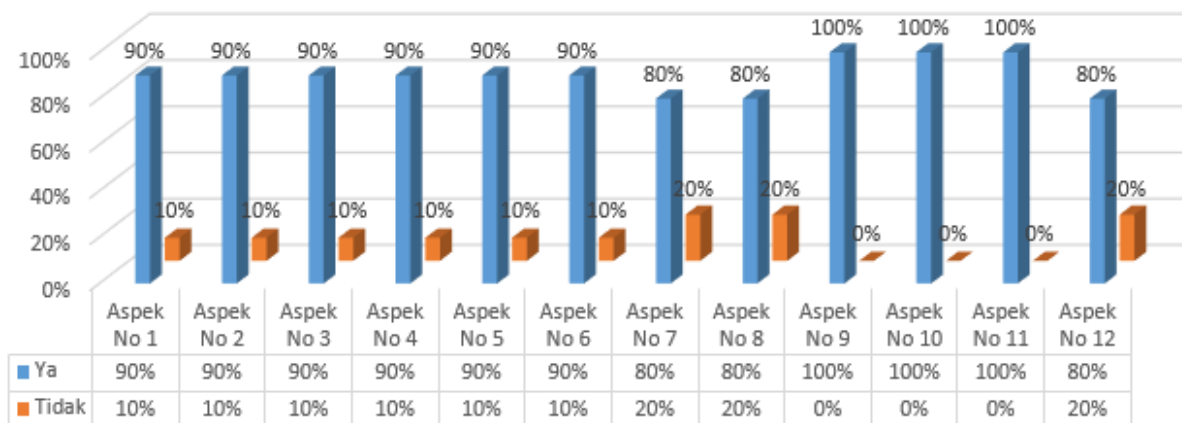
**Figure 2.** Material Validation Results

Based on the Figure 3, the practicality of the media gets a score from the teacher in the very practical category, the teacher gives an assessment of 12 aspects of the practicality of the media by reaching 95%, meaning that the developed media is feasible to use and very practical on a small scale because it doesn't require a lot of time.



**Figure 3.** Results of Media Practicality by Teachers

Based on the Figure 4, the practicality of the media gets value from student responses in the very practical category, students give an assessment of 12 aspects of the practicality of the media with a 90% percentage mode, meaning that the developed media is feasible to use and very practical on a small scale (n = 5 children) because it doesn't take time a lot.



**Figure 4.** Results of Media Practicality by Students

Based on the Figure 5, the effectiveness of the media gets a value from student responses in the very effective category, students give an assessment of 10 aspects of media effectiveness with a 90% percentage mode, meaning that the developed media is suitable for use and very effective on a large scale (n = 10 children) because of the efficiency of critical thinking in students there is an increase.

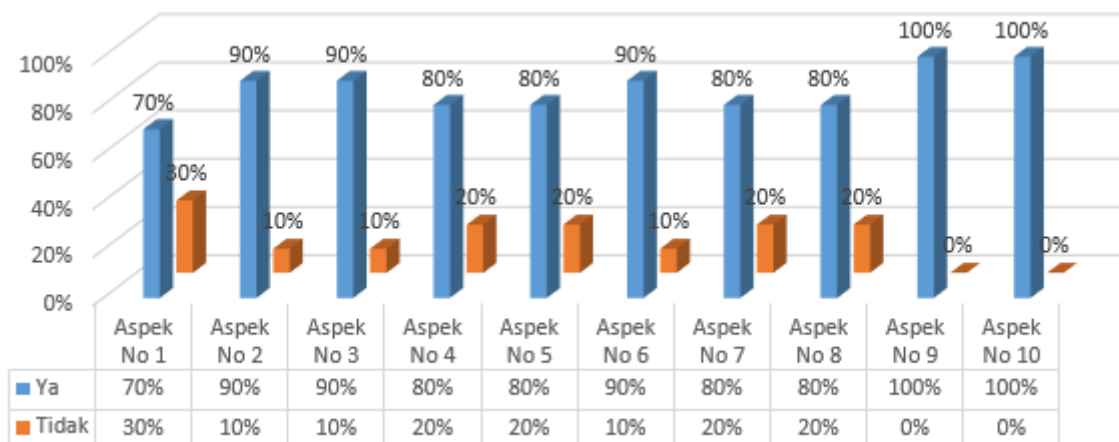


Figure 5. Media Effectiveness Results

**CONCLUSION**

Based on data analysis and discussion of research results, then associated with the formulation of the problem and research objectives, the following conclusions are obtained. The validity of the 3D Audio Visual Exploding Box media meets the criteria for use with minor revisions which include: Media validation from the results of media experts with very good grades. The validator gives an assessment of 14 aspects of the media with a score of 96%, meaning that audio-visual media with validation from experts is very feasible to use and can be accounted for by scientific work. Material validation from the results of material experts with very good grades. The validator provides an assessment of 7 aspects of the material with a score of 93%, meaning that audio-visual media with validation from experts is very feasible to use and can be accounted for by scientific work. The practicality of Exploding Box 3D Audio Visual media is developed which meets the practical criteria which include: The results of the practicality of the media developed by the researcher received an assessment from the teacher with a tendency for the practicality of the media to be very good. The practicality here is on a small scale because it's easier to take samples and it's also easier to see practicality in the media. Practicality by using 5 children as a sample so it doesn't take a lot of time. The results of the practicality of the media developed by the researchers received an assessment of the responses of students with a tendency for media practicality, which was very good. This practice uses a small scale with a sample of 5 children to facilitate research and does not require a lot of time. The effectiveness of Exploding Box 3D Audio Visual media is developed which meets the effectiveness criteria which include: The students' responses were obtained from filling out the questionnaire given after the learning process. This questionnaire sheet was filled in by 10 grade V students, on a large scale the researcher took a sample of 10 students to see the effectiveness of the Exploding Box 3D Audio Visual media that was developed. Effective here from previous research by Kusni & Hendratno (Kusni et al., 2021) and Wahyunita & Subroto (Wahyunita & Subroto, 2021) research with the efficiency of critical thinking in students there is an increase.

**RECOMMENDATION**

Recommendations that can be stated by researchers regarding the research that has been carried out include: To apply Audio Visual media to improve critical thinking skills, the teacher must explore learning materials and any natural disasters in the surrounding environment.

Critical thinking skills are important to apply in learning because they can increase student activity. By applying Audio Visual media to improve critical thinking skills, students are encouraged to maintain the environment in their area. Learning Audio Visual media can be developed with a larger subject with other appropriate materials.

## REFERENSI

- Abdulhak, I., & Dermawan, D. (2013). *Teknologi Pendidikan*. PT Remaja Rosdakarya.
- Adam, S. (2014). Aplikasi Teori Perkembangan Bahasa Menurut Vygotsky dalam Pendidikan. *Jurnal Manajemen Pendidikan Islam*, 2(2).
- Angko, N., & Mustaji. (2013). Pengembangan Bahan Ajar Dengan Model Addie Untuk Mata Pelajaran Matematika Kelas 5 Sds Mawar Sharon Surabaya. *Kwangsan: Jurnal Teknologi Pendidikan*, 1(1), 1–15.
- Apriyanti, D. (2013). *Peningkatan Aktivitas Dan Prestasi Belajar Ips Melalui Pembelajaran Model Cooperative Learning Tipe Stad Pada Siswa Kelas V Sd Negeri 1 Campang Raya Bandar Lampung* [Pgsd]. Universitas Lampung.
- Arikunto, S. (2013). *Prosedur Penelitian Suatu Pendekatan Praktik Edisi Revisi*. PT. Rineka Cipta.
- Arsyad, A. (2016). *Media Pembelajaran*. Raja Grafindo Persada.
- Arsyad, Azhar. (2013). *Media Pembelajaran*. Raja Grafindo Persada.
- Artapranata, I. G. H., Meter, I. G., & Sujana, I. W. (2014). Pengaruh Model Pembelajaran Think Pair Share (Tps) Berbantuan Media Audio Visual Terhadap Hasil Belajar Ips Siswa Kelas V Gugus Kapten Japa Denpasar Utara Tahun Ajaran 2013-2014. *MIMBAR PGSD Undiksha*, 2(1).
- Asy'ari, M., & da Rosa, C. T. W. (2022). Prospective Teachers' Metacognitive Awareness in Remote Learning: Analytical Study Viewed from Cognitive Style and Gender. *International Journal of Essential Competencies in Education*, 1(1), 18–26. <https://doi.org/10.36312/ijece.v1i1.731>
- Badan Pusat Statistik Kabupaten Gresik. (2022). *Pertumbuhan Ekonomi Kabupaten Gresik 2022*. <https://Gresikkab.Bps.Go.Id/>.
- Baker, P. (2010). *Sociolinguistics and Corpus Linguistics*. Edinburgh University Press.
- BNSP. (2013). *Paradigma Pendidikan Nasional Abad-XXI*. BSNP.
- Cahyo, A. (2013). *Panduan Aplikasi Teori-Teori Mengajar*. DIVA Press.
- Daryanto. (2013). *Menyusun Modul Bahan Ajar Untuk Persiapan Guru Dalam Mengajar*. Gava Media.
- Effendi, R. (2017). Konsep Revisi Taksonomi Bloom Dan Implementasinya Pada Pelajaran Matematika Smp. *Jipmat*, 2(1). <https://doi.org/10.26877/jipmat.v2i1.1483>
- Ekayanti, B. H., Prayogi, S., & Gummah, S. (2022). Efforts to Drill the Critical Thinking Skills on Momentum and Impulse Phenomena Using Discovery Learning Model. *International Journal of Essential Competencies in Education*, 1(2), 84–94. <https://doi.org/10.36312/ijece.v1i2.1250>
- Fitriani, H., Samsuri, T., Rachmadiarti, F., Raharjo, R., & Mantlana, C. D. (2022). Development of Evaluative-Process Learning Tools Integrated with Conceptual-Problem-Based Learning Models: Study of Its Validity and Effectiveness to Train Critical Thinking. *International Journal of Essential Competencies in Education*, 1(1), 27–37. <https://doi.org/10.36312/ijece.v1i1.736>
- Hasbullah. (2017). *Dasar-Dasar Ilmu Pendidikan Edisi revisi* (Edisi Revisi). Rajawali Pers.
- Ichsan, M. (2016). Psikologi pendidikan dan ilmu mengajar. *JURNAL EDUKASI: Jurnal Bimbingan Konseling*, 2(1), 60–76.
- Irwan, & Haryono, D. (2015). *Pengendalian Kapasitas Statistik*. Alfabeta.
- Jatim, R. (2023). *Hati-hati, Kali Lamong Meluap Lagi, Jalan Morowudi Cerme Gresik Terendam*. RadarJatim.Id.

- Kusni, K., Nasution, N., Suprijono, A., & Hendratno, H. (2021). Pengembangan Media Ebook Cergam Berbasis Kearifan Lokal Batik Tanjung Bumi Untuk Meningkatkan KARAKTER SISWA. *Eduexos: Jurnal Pendidikan Sosial Dan Ekonomi*, 10(2).
- Lewis, S. L. et al. (2011). *Medical Surgical Nursing* (Vol. 1). Elsevier Mosby.
- Majid, A. (2014). *Pembelajaran Tematik Terpadu*. PT Remaja Rosdakarya.
- Musahidin, M., Muhali, M., Asy'ari, M., & Sukaisih, R. (2022). Meningkatkan Pemahaman Konsep dan Kesadaran Metakognisi Siswa pada Materi Struktur Atom Melalui Pemodelan. *Journal of Authentic Research*, 1(1), 18–32. <https://doi.org/10.36312/jar.v1i1.637>
- Nugrahaeni, A., Redhana, I. W., & Kartawan, I. M. A. (2017). Penerapan model pembelajaran discovery learning untuk meningkatkan kemampuan berpikir kritis dan hasil belajar kimia. *Jurnal Pendidikan Kimia Indonesia*, 1(1), 23–29.
- Pramesti, J. (2015). Pengembangan Media Pop-Up Book Tema Peristiwa Untuk Kelas III SD Negeri Pakem 1. *Skripsi*. Yogyakarta: Universitas Negeri Yogyakarta.
- Prawira, P. A. (2013). *Psikologi Pendidikan dalam Perspektif Baru*. Ar-Ruzz Media.
- Sadiman, A. S., Rahardjo, R., Haryono, A., & Rahardjito. (2011). *Media Pendidikan: Pengertian, Pengembangan, dan Pemanfaatannya*. PT. Raja Grafindo Persada.
- Sari, D. S. (2014). *Pengembangan Media Audio Visual Berbasis Masalah dalam Meningkatkan Motivasi Belajar dan Kemampuan Berpikir Kritis Peserta Didik pada Materi Redoks*. Universitas Negeri Yogyakarta.
- Sarwinda, K. (2014). *Pengembangan Media Pembelajaran Audio Visual Berpendekatan CTL Materi Ksp untuk Meningkatkan Motivasi Belajar dan Kemampuan Berpikir Kritis Siswa*. Universitas Negeri Yogyakarta.
- Sudirman. (2015). *Pasar Modal dan Manajemen Portofolio*. Sultan Amai Press.
- Sudjana, N. (2016). *Penilaian Hasil Proses Belajar Mengajar*. Remaja Rosdakarya.
- Sugiyono. (2015). *Metode Penelitian Kuantitatif dan R&D*. Alfabeta.
- Suhrman, S., & Ghazali, I. (2022). Exploring Students' Critical Thinking and Curiosity: A Study on Problem-Based Learning with Character Development and Naturalist Intelligence. *International Journal of Essential Competencies in Education*, 1(2), 95–107. <https://doi.org/10.36312/ijece.v1i2.1317>
- Suriawati, S. (2014). *Pengembangan Media Audiovisual Dengan Pendekatan SETS Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa*. Universitas Negeri Yogyakarta.
- Susanto, A. (2014). *Perkembangan Anak Usia Dini*. Prenada Media Group.
- Susanto, H., & Akmal, H. (2019). *Media Pembelajaran Sejarah Era Teknologi Informasi (Konsep Dasar, Prinsi Aplikatif, dan Perancangannya)*. FKIP Universitas Lambung Mangkurat.
- Tegeh, I. M., Jampel, I. N., & Pudjawan, K. (2014). *Model penelitian pengembangan*. Graha Ilmu.
- Trianto. (2010a). *Model Pembelajaran Inovatif-Progresif Konsep, Landasan, dan Implementasi Pada Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Kencana.
- Trianto. (2010b). *Model Pembelajaran Terpadu, Konsep, Strategi dan Implementasinya dalam KTSP*. Bumi Aksara.
- UNESCO. (2018). *UNESCO*. [https://Kwriu.Kemdikbud.Go.Id/Unesc o/Tentang-Unesco/](https://Kwriu.Kemdikbud.Go.Id/Unesc%20o/Tentang-Unesco/).
- Wahyunita, I., & Subroto, W. T. (2021). Efektivitas model pembelajaran blended learning dengan pendekatan STEM dalam upaya meningkatkan kemampuan berfikir kritis peserta didik. *Edukatif: Jurnal Ilmu Pendidikan*, 3(3), 1010–1021.
- Wijaya, E. Y., Sudjimat, D. A., Nyoto, A., & Malang, U. N. (2016). Transformasi pendidikan abad 21 sebagai tuntutan pengembangan sumber daya manusia di era global. *Prosiding Seminar Nasional Pendidikan Matematika*, 1(26), 263–278.
- Wirzal, M. D. H., Nordin, N. A. H. M., Bustam, M. A., & Joselevich, M. (2022). Bibliometric Analysis of Research on Scientific Literacy between 2018 and 2022: Science Education



Subject. *International Journal of Essential Competencies in Education*, 1(2), 69–83.  
<https://doi.org/10.36312/ijece.v1i2.1070>

Zahro, L. (2016). *Pengembangan buku ajar berbasis multimedia pop up di kelas II MI AL-Azhaar Bandung Tulungagung*. Universitas Islam Negeri Maulana Malik Ibrahim.

Zubaedi. (2012). *Desain Pendidikan Karakter: Konsepsi dan Aplikasi dalam Lembaga Pendidikan*. Kencana.