



## **The Development of Interactive Learning Media Based on Visual Basic for 8th Grade Junior High School in Application (VBA) on Additive, Addictive and Psychotropic Substances**

**Erlina Wati <sup>1</sup>, Nurul Afifah <sup>2</sup>, Anggi Kusuma Sari <sup>3</sup>, Restesa Rahmayumita <sup>4</sup>,  
Muhammad Nasir <sup>5\*</sup>**

<sup>1,2,3,4,5</sup> Magister Pendidikan IPA, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Riau  
Jl. Bina Widya KM. 12,5 Simpang Baru, Pekanbaru, 28293, Indonesia.

\* Corresponding Author. E-mail: [muhammad.nasir@lecturer.unri.ac.id](mailto:muhammad.nasir@lecturer.unri.ac.id)

*Received: 06 Januari 2023; Revised: 16 Januari 2023; Accepted: 03 Oktober 2023*

**Abstract:** This study aims to develop interactive learning media. The research method used is the ADDIE development research method. There are five stages of developing this interactive media, namely analysis, design, development, implementation, and evaluation. The assessment instrument consists of three experts and users. The data analysis technique used is the descriptive quantitative. The data which has been analyzed is then described qualitatively to find out the research category in each aspect, the design aspect with an average score of 0.819 with the high category, the pedagogic aspect 0.817 with the high category, the content aspect 0.817 with the high category and technique aspect 0.07 moderate category. The developed simulation can be used, interactive, and can explain the concept well.

**Keywords:** Addictive Substances, Interactive, Learning Media, Powerpoint VBA.

**How to Cite:** Wati, E., Afifah, N., Sari, A. K., Rahmayumita, R & Nasir, M. (2022). The Development of Interactive Learning Media Based on Visual Basic for 8th Grade Junior High School in Application (VBA) on Additive, Addictive and Psychotropic Substances. *Jurnal Inovasi Pendidikan IPA*, 9(2), 203-215. doi:<https://doi.org/10.21831/jipi.v9i2.57185>



### **INTRODUCTION**

Nowadays, technology is growing rapidly which causes the quality of human resources is a must in order to develop and improve the human itself. In realizing progress in the field of technology accompanied by human resources who are experts in influencing the development of progress in a country, rapid technological developments need to be accompanied by experts. One of the two is education (Rosmayanti & Zanthi, 2019).

Individuals play an important role in life as they seeing education is also the key in meeting the needs of life. Progresses can be achieved by countries if they are qualified in education. In Indonesia, especially education is carried out in various ways. One of the efforts taken to improve the quality of education is through improving the quality of learning in schools which can be done by improving the quality of teachers and improving learning facilities and infrastructure (Maryana et al., 2022).

The role of the teacher is very important in terms of improving the quality of education. The teacher will construct students in learning in class so that the material can be understood properly. One of the facilities and infrastructure that can support learning is the need for appropriate learning media to be used in the learning process (Maryana et al., 2022; Tjiptiany et al., 2016). Learning media as a tool for teachers in teaching and learning. Learning media functions in clarifying the delivery or information of learning material so that it can be conveyed properly. Learning media can increase the motivation and focus of students in learning. Good learning media itself is a learning media that makes it easier for

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



students so that information that is difficult for students to receive can be understood (Chotimah & Manoy, 2021; Lukitawati, 2014; Yusuf et al., 2015).

Interactive learning media is learning media that integrates texts, images, videos, and animations that are operated using computer. The benefit of interactive learning media is that it can visualize abstract concepts. The use of interactive media makes learning more interesting, varied, interesting and has various learning activities (Astuti et al., 2021). The use of interactive media is also able to improve student learning outcomes so it is concluded that interactive learning media is effective for applying in learning (Novianto et al., 2018; Satriawan et al., 2020).

Software that can be used to produce an interactive learning media is Microsoft Power Point which has ease and simplicity in making it. In the learning process teachers has used Microsoft Power Point a lot in delivering learning material (Sma, 2018; Zabidi, 2019).

To be able to produce interesting and interactive learning media using Microsoft Power Point, Visual Basic for Application features can be added during the manufacturing process. Visual Basic for Application (VBA) is a programming language that exists in Microsoft Office programs such as Microsoft Word, Microsoft Excel, Access, Outlook, and Microsoft Powerpoint. VBA is a programming language that is easier to learn than other programming languages such as Java Script, Java SQL, PHP, C++, Python (Rosmayanti & Zanthi, 2019). Menus contained in PowerPoint such as triggers, hyperlinks, macros, VBA, and Add on Microsoft Power Point facilities such as iSpring can make learning media from Microsoft Powerpoint become powerful and can be used to make learning media of all kinds of subjects (Purwanto, 2015) Bernard & Senjayawati (2019) learning media using VBA can help teachers produce teaching aids that are more practical and efficient, and can provide interactive images.

One of the causes of the emergence of learning using interactive multimedia is the lack of communicativeness in the delivery of learning material and student saturation (Daryanto, 2018). Multimedia is a combination of graphics, texts, sounds, videos, and animations (Arsyad, 2011). A multimedia can be referred to as interactive multimedia if students can interact with the multimedia. According to the use of controllers owned by interactive multimedia must be entirely on the users. The users meant here are students that are also invited to interact during the learning process. Interactive multimedia benefits can be felt optimally if it has good quality. PowerPoint is the most popular presentation application program today. It is a multimedia-based program provided by Microsoft Office that offers a lot of conveniences in processing and creating interactive presentations that are widely used in learning, seminars, workshops, meetings, or product presentations. In utilizing the Microsoft PowerPoint program as a learning moderate, teachers need several indicators: (1) electronic devices in the multimedia category in the form of computers or laptops that can involve audio, visual, and kinetic; and (2) to make projections during presentations, a Liquid Crystal Display (LCD) Projector is needed.

The combination of PowerPoint and VBA is able to create videos and interaction questions. VBA is a programming language or macro specifically intended for Microsoft Office which is slightly different from the usual Visual Basic. To find out the feasibility of learning media, it can be reviewed, namely appropriation, accuracy, currency, clarity, and screen presentation and design (Anomeisa & Ernaningsih, 2020).

Rohmah stated that Microsoft PowerPoint is an application program used to show presentations. However, many people don't know about Visual Basic for Application (VBA) which is in Microsoft PowerPoint. Marcovitz et al. mentions that the use of visual basic for application (VBA) can make PowerPoint appearance more attractive (Zubaidah, 2020).

The introduction section includes some fragmented paragraphs which have limited relations to previous and latter sentences. Please improve fluency of the introduction and directly depict your aim(s) and research questions. Also, you can move some sentences to the 'method' section to create a new sub-heading on requirements of the software or programme. The authors should have a look at two sample papers I have found interesting for capturing how to effectively present their paper.

## **METHOD**

This research was conducted in 2022 using Research and Development (R&D) (Sisca et al., 2022) as the method. The research data were obtained from the results of the analysis of the needs of the

respondents, expert validation sheets and small-scale test sheets. Media learning products/devices are declared valid if the assessment scores of the validation results and small-scale tests are in the Moderate and High categories using the ADDIE model development procedure.

Quantitative data we data were obtained from the score validation sheets and small-scale test sheets and qualitative were obtained from comments, suggestions for improvement written on the assessment validation sheet. Learning media validation indicators used in Interactive, as can be seen in Table 1.

**Table 1. Learning media validation indicators**

No	Aspects	Questions
1	Design	1-9
2	Pedagogic	10-19
3	Content	20-28
4	Technical	29-36

Source: Adaptation (Nasir, 2017)

The data from filling out the product validation sheet by the validator is analyzed to determine the level of product validity using the Aiken's V validity index (Nabila et al., 2021; Masithah et al., 2022; Oktariyanti et al., 2021) is used as an analysis to determine the level of product validity from the acquisition of the results of filling out the validation sheet. Interactive learning media validation was carried out by three experienced experts in the field of learning material, language and learning media experts. After going through the validation process, Interactive media was revised based on the validator's suggestion, then a small-scale test was also carried out by 5 science subject teachers and 30 students who were randomly selected as samples to test the interactive media. each item is calculated using the formula each item is calculated using the formula:

$$V = \frac{\sum s}{n(c-1)} \tag{1}$$

Interactive learning media in this study is declared valid if all the indicators in the validity instrument are as shown in the table below:

**Tabel 2. Indicators of learning media validation scoring**

No.	Value Range	Category
1.	$V \leq 0,4$	Low Validity
2.	$0,4 > V > 0,8$	Moderate Validity
3.	$V \geq 0,8$	High Validity

Source : Adaptation (Nabila et al., 2021)

## Results

The following are the results of research on the development of learning tools at each stage.

### Analysis Stage (Analysis)

The analysis carried out consisted of material analysis and needs analysis. Material analysis was carried out by means of a literature study to identify material that is in line with the development of interactive learning media. And the analysis of learning media needs was obtained from the distribution of data to 30 class VII students with the results of the questionnaire percentage of respondents, namely strongly agreeing 20%, agreeing 50%, disagreeing 30% and strongly disagreeing 0% on the existence of interactive learning media, but overall there are 70% who say the development of interactive media is needed as a solution and support for learning.

### Design Stage (Design)

Making interactive media is made using the Power point application and proceed to the next design stage which can be seen in the following flowchart:

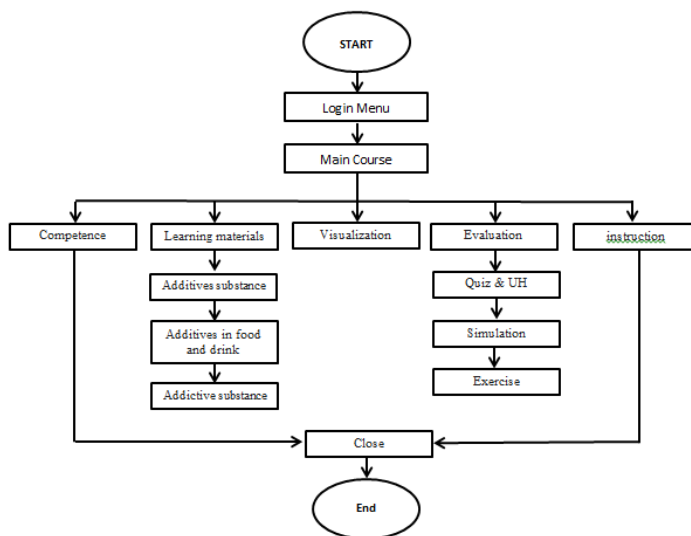


Figure 1. Interactive learning media design flowchart

This design stage begins with designing coding in the scheme of making learning media, such as preparing opening activities, content of learning materials, learning videos that will be used and providing learning experiments, evaluation questions that will be needed and closing activities. Some of the formulas used in making interactive learning media based on Visual Basic For Applications are as follows.

```

Private Sub CommandButton2_Click()
    TextBox1 = ""
    TextBox2 = ""
    ActivePresentation.SlideShowWindow.View.ResetSlideTime
End Sub

Private Sub TextBox1_Change()
End Sub

Private Sub CommandButton1_Click()
    If TextBox1 = "tesa" And TextBox2 = "12345" Then
        ActivePresentation.SlideShowWindow.View.Next
    Else
        MsgBox "Sorry, your username or password is incorrect!"
    End If
    TextBox1 = ""
    TextBox2 = ""
End Sub
    
```

Figure 2. Login coding menu

```

Sub takename ()
nama = InputBox("Enter Your Name : ")
MsgBox " Start Quiz " + Name
ActivePresentation.SlideShowWindow.View.Next
End Sub

Sub start ()
takenama
nilai = 0
ActivePresentation.SlideShowWindow.View.Next
End Sub

Sub benar ()
konfirmasi = MsgBox("Confident with your answer ?" + username, vbYesNo, " Think again!")
If konfirmasi = vbYes Then
nilai = nilai + 33
ActivePresentation.SlideShowWindow.View.Next
End If
End Sub

Sub salah ()
konfirmasi = MsgBox("Confident with your answer?", vbYesNo, " Answers Check !")
If konfirmasi = vbYes Then
ActivePresentation.SlideShowWindow.View.Next
End If
End Sub

Sub score ()
'button to finish
MsgBox (" Your score is      " & score)
'+ username, "& score"
    
```

Figure 3. Interactive question exercises coding

```

Private Sub CommandButton1_Click()
If TextBox1 = "tesa" And TextBox2 = "12345" Then
ActivePresentation.SlideShowWindow.View.Next
Else
MsgBox "Sorry, your username or password is incorrect!"
End If
TextBox1 = ""
TextBox2 = ""
End Sub

Private Sub CommandButton2_Click()
TextBox1 = ""
TextBox2 = ""
ActivePresentation.SlideShowWindow.View.ResetSlideTime
End Sub

Sub takename ()
nama = InputBox("Enter Your Name : ")
MsgBox " Start Quiz " + Name
ActivePresentation.SlideShowWindow.View.Next
End Sub

Sub start ()
takenama
score = 0
ActivePresentation.SlideShowWindow.View.Next
End Sub

Sub benar ()
konfirmasi = MsgBox("Confident with your answer ?" + username, vbYesNo, " Think again!")
If konfirmasi = vbYes Then
    
```

Figure 4. Interactive question exercises coding (continued)

The media design has been made in accordance with the media design flowchart, this is in line with the research conducted that the stages of making a media design consist of an introduction, content, and closing sections. Some of the results of Visual Basic For Application-based interactive media designs can be seen in the pictures below:



Figure 5. Main menu display and interactive learning media login menu

The home page consists of two slides. The first slide contains an overview of the contents of the media and the second slide consists of background parts such as competency buttons, materials, simulations, visualizations, exercises, evaluations, profiles, and instructions for using the media. The opening page consists of the media title, the username button which functions to enter a name, the password to enter the password that has been designed in the coding section, log in which functions to enter the next slide which contains material and the reset button is to delete the username and password which was entered when we wanted to start the slide show. In its design, it also utilizes the hyperlink facility which is used to connect between slides which functions to create an interface between slides where the background (background) is made colorful to attract students' attention at first sight.



Figure 6. Display the contents of interactive learning media

The competency display has the same appearance and button functions as the home page. However, on the competency page, there is a home button that functions to return to the home page. The home page contains Competency Standards, Basic Competencies and Indicators according to the teacher's syllabus.

The appearance of the material page is the same as the appearance on the competency page. This page contains two topics of discussion according to indicators which are made in the form of link

buttons. If one is clicked, it will go to the desired material page. The material page consists of 40 slides which contain material according to the indicators.

The exercise page displays the usual background. It doesn't require a lot of colors and pictures, so that students are more focused on working on the practice questions. The display is also more or less the same as the display in the previous slides. Exercise 1 button to bring up the questions in practice 1 while for buttons 2 and 3 to bring up practice questions 1 and 2.



Figure 7. Display Cover Interactive learning media

The last display is the closing section which contains instructions for use in interactive learning media, the instructions for use are designed to make it easy for students to recognize the symbols in the media. Apart from the instructions for using the media, there is also a profile that contains the biodata of the learning media maker.

**Development Stage (Development)**

This stage is carried out in the form of media expert validation and small-scale tests. The purpose of validation is so that the interactive learning media developed is suitable for use and applied as learning media in schools on addictive, addictive and psychotropic substances. Media validation was carried out twice. The aspects assessed in media validation are design feasibility, pedagogical feasibility, content feasibility and technical feasibility. The results of the validation after revision of the media according to the suggestions given by experts are presented in Figure 8.

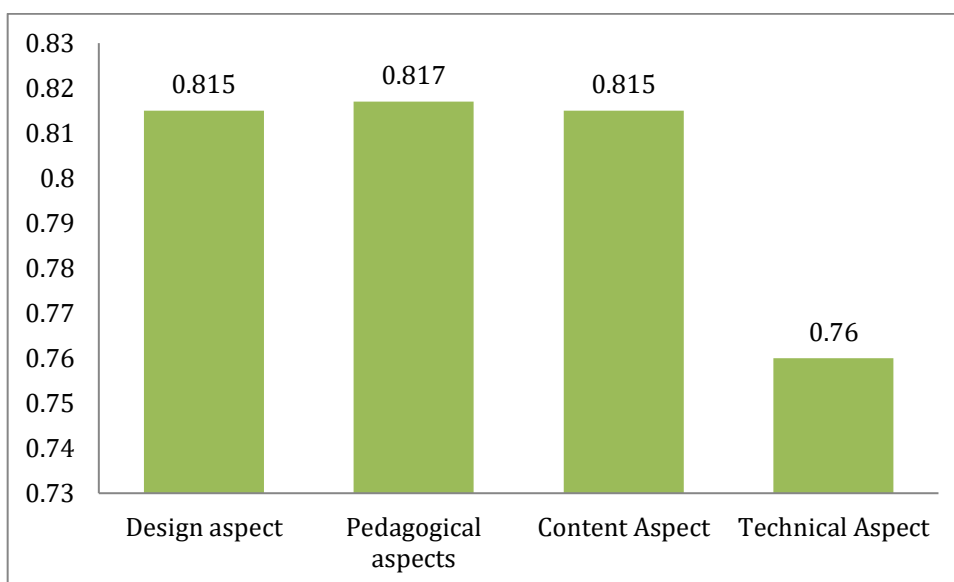


Figure 8. Interactive learning media validation data

Interactive learning media that have been developed and validated by three expert validators show that the media is a good and valid learning media. After the interactive learning media was declared valid, the researcher conducted a small-scale test of the interactive learning media to 5 junior high school

teachers and 30 students by providing interactive learning media application files to each tester and small-scale test sheets with the results of each assessment, such as which can be seen in Figure 9.

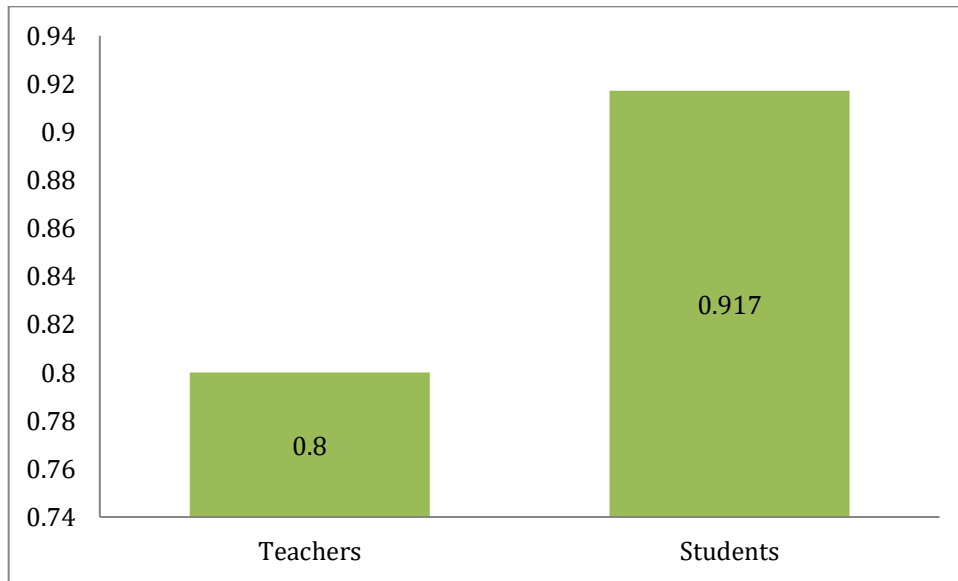


Figure 9. Interactive learning media small-scale test data

### Assessment Stage (Evaluation)

In the evaluation stage where the researcher analyzed the results of the survey and test. In the analysis stage of the survey conducted in the previous stage, it was found that the PowerPoint interactive learning environment tested in small and large classes can be said to be very practical. The next step for the researcher was to analyze the test scores of the students in the large-scale test. The purpose of analyzing student learning test results is to find out whether the media has a potential effect on learning.

### Discussion

The first aspect is the design aspect which gets an average score of 0.81 in the high category. From the questionnaire sheet given to the validator it is known that in this aspect a high score is obtained, this aspect consists of material coverage, material accuracy, and material renewal. Swandi et al. (2021) stated that the design aspect is an important factor in the development of a product. From these aspects, it can be seen that the material displayed includes the truth of the contents in the form of facts, concepts, principles, theories, and scientific processes following the basic competencies and indicators to be achieved. Then updating the material is also an important aspect according to the content presented to make it easier for students to achieve learning indicators.

The second aspect is the pedagogic aspect by obtaining an average score of 0.817 in the high category. The pedagogic aspect consists of indicators of presentation completeness, presentation support, presentation appearance, presentation quality and presentation effectiveness. Based on the average recapitulation, it was found that the pedagogic learning media is appropriate for use as a learning moderate supported by good content display so that it can attract students' attention, is easy to use, and can convey messages well (Gowasa et al., 2019). In addition, the quality and appearance of this media that has been developed is in accordance with the requirements of good media, namely effective, efficient and communicative (Damitri & Adistana, 2020)

The third aspect is the content aspect, from the questionnaire that was given to the respondents it was found that 0.815 was in the high category, the content aspect consisted of conformity with language rules, communicative, interactive. This aspect is very important because the contents of the learning media will be seen by students, in terms of language it is a very influential factor because the use of EYD language will make it easier for students to understand the meaning of the interactive media. The communicative media developed must also be communicative so that students understand what the media conveys. The value from the content aspect shows that the media being developed is feasible to



be implemented to students. In accordance with Damayanti & Prihatina, 2022 which states that the content aspect states that the media developed must have a decent or high category with a very good predicate.

The last aspect is the technical aspect by obtaining an average score of 0.76 in the Moderate category. technical aspects are considered good if they are in the moderate and high categories The results of the overall recapitulation of the 4 validated aspects obtained a score of 0.80 with a high category, so that interactive learning media is feasible to use and implement in line with research (Ayu et al., 2022; Astika, R et al., 2020) states that appropriate learning media can be carried out and tested try it at school to help understand concepts and processes in learning.

Acquisition of a small-scale test with an average result of 0.80 Teacher in the high category and 0.917 students in the high category and an overall average result of 0.85 in the high category and based on the results of the data obtained from the small-scale test of interactive learning media is valid and is suitable for use as a learning moderate in schools in line with research conducted by Agariadne et al. (2019) that the use of interactive learning media based on Visual Basic for Applications can have a positive, good and effective influence in being able to help overcome difficulties in the guidance process and improve learning outcomes and digital literacy skills in students.

## CONCLUSION

Based on the results of processing and analysis of the data that has been described, it is concluded that the VBA-based interactive media developed by researchers are in the high category, especially in the pedagogical aspect with a percentage of 0.817. Thus, the development of this media can be applied so that the learning process becomes more interesting and interactive. The use of VBA-based interactive media is intended so that teachers or other researchers can develop similar simulations more easily and interestingly. The use of this media can make learning more effective, interesting, and interactive. By applying this media, teachers can create an active learning process so that students are more enthusiastic about learning. Future researchers are expected to be able to develop a more complex form of simulation so that the content displayed is even more interesting.

## REFERENCES

- Anomeisa, A. B., & Ernaningsih, D. (2020). Media Pembelajaran Interaktif Menggunakan PowerPoint VBA Pada Penyajian Data Berkelompok. *Jurnal Pendidikan Matematika Raflesia*, 05(01), 17–31.
- Arsyad, A. (2011). *Media pembelajaran*.
- Astuti, N., Nurhayati, Yuhafliza, Nurmina, & Isnani, W. (2021). Pelatihan Pengembangan Media Pembelajaran Berbasis Daring di Era New Normal pada Guru SMA Negeri 2 Dewantara. *JMM (Jurnal Masyarakat Mandiri)*, 5(2), 445–457. <http://journal.ummat.ac.id/index.php/jmm/article/view/4061>
- Ayu, K., Saputri, L., & Suwiwa, I. G. (2022). Media Pembelajaran Video Tutorial Teknik Dasar Lempar Petanque. *Jurnal Mimbar Ilmu*, 27(2), 254–261.
- Bernard, M., & Senjayawati, E. (2019). Developing the Students' Ability in Understanding Mathematics and Self-confidence with VBA for Excel. *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, 4(1), 45–56. <https://doi.org/10.23917/jramathedu.v4i1.6349>
- Chotimah, S. C., & Manoy, J. T. (2021). Pengembangan Media Pembelajaran Berbasis Powerpoint Visual Basic for Application (VBA) Untuk Mendukung Kemampuan Spasial Siswa. *MATHEdunesa*, 10(2). [https://doi.org/10.26740/mathedunesa.v10n2.ppdf\\_374-384](https://doi.org/10.26740/mathedunesa.v10n2.ppdf_374-384)
- Damayanti, V. F., & Prihatina, Y. I. (2022). Pengembangan E-modul Interaktif Membuat Desain Blus di Kelas XI SMK Keahlian Tata Busana. *Jurnal UNNES*, 11(2), 40–47.
- Damitri, D. E., & Adistana, G. A. Y. P. (2020). Keunggulan media powerpoint berbasis audio visual

sebagai media presentasi terhadap hasil belajar siswa SMK teknik bangunan. *Jurnal Kajian Pendidikan Teknik Bangunan*, 06(02), 1–7. <https://ejournal.unesa.ac.id/index.php/jurnal-kajian-ptb/article/view/36296>

- Daryanto, J. (2018). Penggunaan media pembelajaran video interaktif untuk meningkatkan pemahaman tentang macapat dalam pembelajaran bahasa daerah pada siswa sekolah dasar. *Jurnal Pendidikan Dasar*, 6(1), 8–15.
- Gowasa, S., Harahap, F., & Suyanti, R. D. (2019). Perbedaan Penggunaan Media Powerpoint dan Video Pembelajaran terhadap Kemampuan Berpikir Tingkat Tinggi dan Retensi Memori Siswa pada Mata Pelajaran IPA di Kelas V Sd. *Jurnal Tematik*, 9(1), 19–27.
- Lukitawati, P. (2014). Pengembangan Media Pembelajaran Matematika Berbasis ICT (Information and Communication Technology) melalui Pendekatan SAVI (Somatic, Auditory, Visual, and Intellectual) pada Materi Geometri Transformasi Kelas VII di SMP Ma'had Islam Pekalongan. *Delta: Jurnal Ilmiah Pendidikan Matematika*, 2(2), 42–50. <http://jurnal.unikal.ac.id/index.php/Delta/article/view/433/395>
- Maryana, L., Hikmawati, Rokhmat, J., & Susilawati. (2022). Pengembangan Media PPT Visual Basic Application Berbasis Model Kooperatif Tipe NHT untuk Meningkatkan Motivasi dan Penguasaan Konsep Fisika Peserta Didik SMA. *Jurnal Ilmiah Profesi Pendidikan*, 7(2c), 964–973. <http://www.jipp.unram.ac.id/index.php/jipp/article/view/691>
- Nabila, S., Adha, I., & Febriandi, R. (2021). Pengembangan Media Pembelajaran Pop Up Book Berbasis Kearifan Lokal pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, 5(5), 3928–3939. <https://jbasic.org/index.php/basicedu/article/view/1475>
- Nasir, M. (2017). Design and Empirical Analysis Visualization Motion And Vector Analysis Program As Interactive Multimedia Physics Learning at. *Applied Science and Technology*, 1(1), 240–227. <http://www.estech.org>
- Novianto, Degeng, I. N. S., & Wedi, A. (2018). Pengembangan Multimedia Interaktif Mata Pelajaran IPA Pokok Bahasan Sistem Peredaran Darah Manusia Untuk Kelas VIII SMP Wahid Hasyim Malang Lukman Arief Novianto, I Nyoman Sudana Degeng, Agus wedi. *Jurnal Kajian Teknologi Pendidikan (JKTP)*, 1(3), 257–263.
- Purwanto, S. (2015). Pelatihan Pengembangan Media Pembelajaran Interaktif Berbasis Microsoft Power Point Untuk Peningkatan Kompetensi Guru Matematika Di Mgmp Kecamatan Pulogadung. *Sarwahita*, 12(1), 26–31. <https://doi.org/10.21009/sarwahita.121.05>
- Rosmayanti, D., & Zanthi, L. S. (2019). Pengembangan Media Pembelajaran Berbasis Visual Basic Application Powerpoint Pada Materi Sistem Persamaan Linear Dua Variabel. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, 2(6), 401. <https://doi.org/10.22460/jpmi.v2i6.p401-414>
- Samala, A. D., Fajri, B. R., & Ranuharja, F. (2019). Desain Dan Implementasi Media Pembelajaran Berbasis Mobile Learning Menggunakan Moodle Mobile App. *Jurnal Teknologi Informasi Dan Pendidikan*, 12(2), 13–19. <https://doi.org/10.24036/tip.v12i2.221>
- Satriawan, R., Endriana, N., Irianto, F. A., & Ahyang, S. (2020). The Card Logic Logarithm as an Interactive Media in Teaching Logarithm: A Development Study. *Journal of Physics: Conference Series*, 1539(1). <https://doi.org/10.1088/1742-6596/1539/1/012080>
- Sisca, T. A., Evi, N. A., Hariati, W. P., & Dkk. (2022). Makalah Pendamping Development of Practical Apparatus for Comparing Density of Static Fluids Class XI MIPA. *SEMINAR NASIONAL PENDIDIKAN FISIKA VII 2022*, 2830–4535, 1–6.
- Sma, D. I. (2018). Pengembangan Media Pembelajaran Fisika Berbasis Multimedia Interaktif Pada Materi Gerak Parabola Di Sma. *Prosiding*, 03, 18–27.
- Swandi, A., Rahmadhanningsih, S., Putri, R. A., Suryadi, A., & Viridi, S. (2021). Pengembangan

- Simulasi Interaktif Gerak Parabola Menggunakan VBA Excel Dalam Pembelajaran Fisika Received. *Jurnal Riset Pendidikan Fisika*), 6(1), 75–85. <http://journal2.um.ac.id/index.php/jrpf/>
- Tjiptiany, E. N., Rahman As'ari, A., & Muksar, M. (2016). Pengembangan Modul Pembelajaran Matematika dengan Pendekatan Inkuiri untuk Membantu Siswa SMA Kelas X dalam Memahami Materi Peluang. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 1(10), 1938–1942.
- Yusuf, I., Widyaningsih, S. W., & Purwati, D. (2015). Pengembangan perangkat pembelajaran Fisika Modern berbasis media laboratorium virtual berdasarkan paradigma pembelajaran abad 21 dan Kurikulum 2013. *Pancaran Pendidikan*.
- Zabidi, A. (2019). Teacher Creativity in Using Technology as a Media for PAI Learning in Elementary Schools in Bawen District, Semarang Regency. *Jurnal Inspirasi*, 3(2), 2019.
- Zubaidah, A. V. (2020). Uji Validitas Pengembangan Media Pembelajaran Berbasis. *Prosiding Seminar Hasil Penelitian Dan Pengabdian Masyarakat*, 5(2), 384–387.