Jurnal Pendidikan Teknologi dan Kejuruan
Vol. 30, No. 1, May 2024, pp. 98-111
https://journal.uny.ac.id/index.php/jptk/issue/view/2602
DOI: https://doi.org/ 10.21831/jptk.v30i1.66686

How is the basics of marketing e-module developed in vocational high schools?

Faridatul Lailiyah[1], Novi Marlena[2*]
[12]Universitas Negeri Surabaya, Indonesia
Email: novimarlena@unesa.ac.id*
*Corresponding author

ABSTRACT

The transition to the independent curriculum has resulted in limitations in the availability of learning material sources, contrasting with the rapid technological advancements that have not been adequately explored in learning material development. This study aims to determine the feasibility of e-modules and the effectiveness of the e-module assisted by Sigil software. The research model used is the ADDIE R&D model (Analyze, Design, Development, Implementation, Evaluation). The subjects of this research were students in class X Digital Business 2 at Intermediate Vocational School (SMK). Expert reviews and validation sheets, as well as pretest and posttest question sheets, are the instruments used. Evaluation data from experts have been analyzed descriptively and qualitatively, while validation by experts has been analyzed using percentages. Testing product effectiveness has been done using the N-Gain value formula. The research results show that: 1) the e-module assisted by Sigil software in element 3 of phase E of the basics of marketing class X subject was declared very feasible by experts with a validation result score of 94.45%; 2) the effectiveness test obtained an N-Gain value of 0.73 in the high effectiveness category, indicating that e-modules are feasible and effective to be used as teaching materials in the process of learning the basics of marketing.

Keywords: E-Modules, Sigil Software, Marketing Basics

Article history

Received:	*Revised:*	*Accepted:*	*Published:*
16 October 2023	*07 March 2024*	*05 April 2024*	*23 May 2024*

Citation (APA Style): Lailiyah, F., Marlena, N. (2024) How is the basics of marketing e-module developed in vocational high schools? *Jurnal Pendidikan Teknologi dan Kejuruan*, 30(1), 98-111. https://doi.org/10.21831/jptk.v30i1.66686

INTRODUCTION

Education, as outlined in Law no. 20 of 2003, aims to provide planned and conscious learning conditions to develop individuals' potential for life and everyday abilities. Education breaks the chain of ignorance, which is often the gateway to poverty (LPMP, 2018) , Within education, individuals undergo changes in behavior resulting from complex learning processes (Azhar, 2014). Every learning process has a goal, which is achieved through learning improvements. One method to enhance learning quality is through the use of technology at the educational level. The integration of technology can be realized through innovative, digital-based teaching materials, which enhance students' motivation for independent learning. Additionally, digital teaching materials offer increased interactivity and effectiveness (Prastowo, 2014).

Creating an interactive and effective learning environment relies heavily on advancements in digital technology, which enable access to learning resources anytime, anywhere, and by anyone. Technological advancements represent the fourth industrial revolution, which has profound implications for the education sector (Pangaribuan, 2018), Technology facilitates the attainment of learning objectives (Andri et al., 2017) and fosters teachers' creativity and productivity (Umiyatun et al., 2020) . The utilization of technology in education transcends spatial and temporal limitations, allowing students to engage in independent learning according to their needs and preferences. As technology evolves rapidly, both teachers and students must adapt to the globalized landscape. However, the implementation of an independent curriculum, which is associated with changes in learning outcomes (Kemdikbud, 2022) presents its own challenges. These challenges include disparities from previous curricula and limited teaching materials, which hinder the achievement of learning objectives (Natshia & Abadi, 2022).

Based on observations at vocational schools, the availability of teaching materials, in accordance with the independent curriculum, is still very limited. One area of scarcity is books supporting skills concentration learning, particularly in the Basics of Marketing subject. Students in Class X Digital Business are required to master this material before entering the business and industrial world in roles such as salespersons or identifying business opportunities in the marketing sector. However, despite the flexibility and comfort provided by the independent curriculum (Marisa, 2021) the lack of teaching materials can hinder the achievement of learning goals. Hence, interactive teaching materials in the form of e-modules are necessary to encourage student involvement, develop potential, and improve learning outcomes (Munandar et al., 2021) , enhance critical thinking skills (Malik, 2021), and support students in the learning process (Andiyanto et al., 2021) . Additionally, e-modules simplify material delivery for teachers, ensuring effectiveness, and allowing students to learn according to their needs (Puspasari, 2022).

E-modules, as digital or non-print learning media, are particularly effective in fostering students' independence in learning (Andiyanto, 2021), Created with Sigil software, these modules can be accessed via electronic devices using reader applications (Intan, 2019), providing flexibility and user-friendliness (Amalia & Kustijono, 2019). Moreover, designed and developed e-modules serve as effective learning resources for students (Puspasari, 2022). Interactive teaching materials like e-modules cultivate a conducive learning atmosphere (Daryanto, 2014), motivate independent learning through systematic and comprehensive content (Kunandar, 2011), and address learning difficulties (Ahmadi et al, 2011), to achieve desired competencies (Anwar, 2010). Their incorporation of supporting videos, appealing designs, and flexible accessibility facilitates learning anywhere (Muyaroah & Fajartia, 2017), Engaging designs generate enthusiasm for learning (Azhar, 2014) and combat boredom through examples and animations

(Nurmala et al., 2021), Therefore, visual animation enhances students' independent learning by optimizing attention (Rafmana & Chotimah, 2018).

The availability of teaching materials or learning references relevant to the topic of the three phase E elements in the Marketing Basics subject remains limited. Teachers still rely on the 2013 curriculum book and present it via PowerPoint to aid the learning process in class. Consequently, the material cannot be fully delivered, and students struggle to study it independently. However, element 3 holds significant importance as it prepares students for fieldwork or entry into the workforce post-graduation. The goal of element 3 is to equip students with the ability to outline future marketing-related jobs and choose careers that align with their talents, interests, and plans. To address this gap, an E-module for element 3 of phase E, focusing on job profiles and business opportunities in the marketing sector, has been developed. This module includes supporting videos, practice questions, and reading materials, aiming to serve as student reading material and facilitate independent learning. The E-modules are prepared using the Sigil Software application. Therefore, this research aims to assess the feasibility and effectiveness of the E-module for element 3 of the Marketing Basics subject at SMK.

METHOD

The ADDIE development model, developed by Dicky and Carry in 1996 (Branch, 2009) , comprises five stages: 1) Analyze: This stage involves initial analysis to determine the accessibility of learning resources for the three elements of the Marketing Basics subject being developed. It includes identifying learning needs, analyzing the curriculum, and assessing student characteristics to ensure the product aligns with the target users, 2) Design: Planning is conducted based on the findings from the previous stage, such as creating a framework for the E-module, formulating materials, designing media, and creating research instruments, 3) Development: This stage builds upon the previous one, involving drafting according to the components of the independent curriculum module and validating feasibility with material experts, media experts, and linguists, 4) Implementation: Learning is carried out using the developed products in real situations through limited trials, 5) Evaluation: This stage involves formative evaluation to guide improvements from previous stages to the implementation stage, while summative evaluation determines the effectiveness of the E-module's use. In general, the development model paradigm is described as follows.

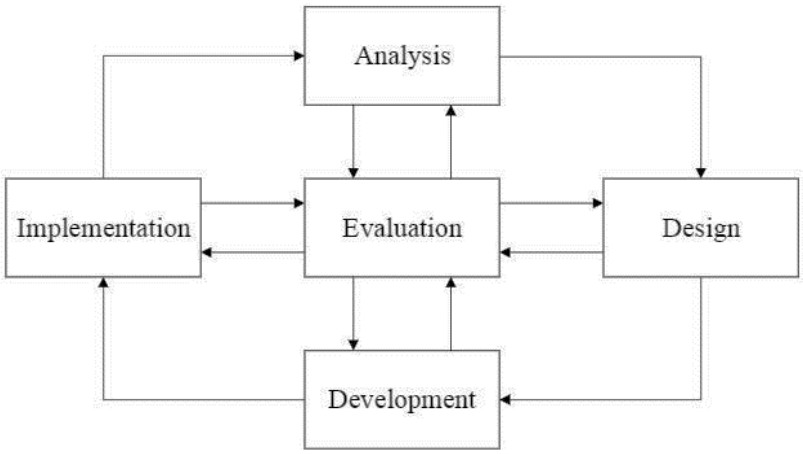


Figure 1. The ADDIE concept

The subjects of this research were students of class X SMK Digital Business at one of the vocational schools in Sidoarjo Regency, East Java. Meanwhile, the experts who assessed the suitability of the research instrument consisted of four experts: two material experts, one media expert, and one language expert. Data collection instruments in this research were obtained through product review and validation sheets, which included assessments from material experts, media experts, and language experts, as well as pretest/posttest question sheets to determine the level of product effectiveness. The collected data were analyzed descriptively and qualitatively. Additionally, the expert validation results were analyzed using a percentage formula to determine the level of feasibility of the e-module, along with an effectiveness test question sheet using the N-Gain value formula.

The validation sheet assessment scale utilized a Likert scale ranging from 1 to 5 (Riduwan, 2015). The assessment scores are depicted in the following table.

Table 1. Expert Validation Assessment Score

Answer Choices	Score
Very Worth It	5
Worthy	4
Decent Enough	3
Not Worth It	2
Not feasible	1

Next, the data obtained will be analyzed using the following formula (Riduwan, 2015)

$$\text{Presentase} = \frac{\text{Total Score Student Answer}}{\text{Total Maximum Score}} \text{ x } 100\%$$

From the results obtained through percentage calculations, they will then be interpreted using assessment criteria to determine the feasibility results from expert validation. The following criteria will be utilized for interpretation (Riduwan, 2015).

Table 2. Assessment criteria

Percentage	Validity Criteria
0% - 20%	Not feasible
21% - 40%	Not Worth It
41% - 60%	Decent Enough
61% - 80%	Worthy
81% - 100%	Very Worth It

The effectiveness of the e-module is calculated based on students' performance scores on pretest and posttest questions. Each correct answer is assigned a value of 10, while incorrect answers receive a value of 0. The final score is then calculated using the following formula Arikunto (2013).

$$Final\ score = \frac{Number\ of\ correct}{Number\ of\ questions}\ x\ 100$$

After calculating the final score for each student, the average score of the pretest/posttest results is then calculated to determine the overall increase in the students' scores, using the adapted formula from Arikunto (2013), as follows.

$$\bar{x} = \frac{\sum x}{n}$$

Information:

$\bar{x}$= average pretest / posttest score

$\sum x$= total pretest / posttest scores of all students

n = number of students

Furthermore, from the average pretest/posttest results, the effectiveness of product use was measured using student learning outcomes using the N-Gain value as follows Hake (1999).

$$g = \frac{score\ posttest - score\ pretest}{score\ maximum - score\ pretest}\ x\ 100$$

The following are the criteria used to classify the level of effectiveness of the product (Hake, 1999)

Table 3. N-Gain Score Effectiveness Criteria

G value	G $\geq$ 0.7	0.7 > g > 0.3	g < 0.3
Criteria	Tall	Currently	Low

RESULTS AND DISCUSSION

This e-module, utilizing Sigil software in EPUB format, can be accessed both online and offline through applications like Readium on laptops or computers, and Reasily on smartphones. It serves as a solution to overcome limitations in teaching materials within the independent curriculum, particularly in element 3 of phase E in the Marketing Basics lesson. The e-module is designed in accordance with the components of the independent curriculum, including general information, core components, and appendices. Additionally, it is equipped with text, images, and videos to aid independent study, aligning with the principle of curriculum freedom that emphasizes freedom and comfort in the learning process (Marisa, 2021). The process of e-module development follows the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation (Branch, 2009).

During the analysis stage, the following objectives are pursued: 1) Needs analysis: This involves identifying the availability of teaching materials in phase E of the Basics of Marketing subject, specifically focusing on job/profession profiles and business opportunities in the marketing field. Currently, schools are using materials from the 2013 Curriculum Book, 2) Curriculum analysis: This entails examining the curriculum requirements and aligning the e-module content with the learning outcomes specified in the Merdeka curriculum. According to the Merdeka curriculum, one of the learning outcomes in the Basics of Marketing subject is for students to be able to explain various job profiles in the marketing field, such as cashier, sales assistant, sales executive, merchandiser, digital marketer, public relations officer, etc. Additionally, students are expected to comprehend business opportunities in the marketing sector, such as drop shipping, drop servicing, affiliate marketing, marketing agencies, content creation, and more. It is also anticipated that students will be able to select a career in the marketing field that aligns with their talents, interests, and passions. and 3) Student analysis: The majority of class X students are aged 15-16 years and belong to Generation Z (iGeneration). The use of e-modules, facilitated by Sigil software, is expected to enhance students' knowledge by creating an engaging learning environment and enabling them to access materials independently through electronic devices such as laptops, personal computers, or smartphones.

Design Stage: At this stage, the researcher: 1) Formulated the material content for the three phase elements of the Marketing Basics subject, namely job/profession profiles and business opportunities in the field of marketing; 2) Prepared an E-Module framework, which includes a cover, general information, core components, and attachments; 3) Composed the E-Module design by adjusting visual elements such as images, colors, videos, and audio to suit the content needs of this E-Module based on relevant reference sources.

Development Stage: At this stage, the researcher: 1) Prepared a draft of the E-Module consisting of a cover, table of contents, general information, core components, and attachments; 2) Obtained assessments from experts regarding the feasibility of the E-Module that had been developed. The experts' assessments and validations are in the form of review results and validation outcomes.

Implementation Stage: This e-Module was tested on 39 class X Digital Business students at one of the vocational schools in Sidoarjo Regency, East Java.

Evaluation Stage: This stage is used to evaluate the products that have been developed, namely the E-Module for the Basics of Marketing subject. It aims to make improvements based on the input and suggestions given by experts. Additionally, an effectiveness test was conducted on the use of the E-Module for the Basics of Marketing subject by evaluating the results of pre-test and post-test scores.

Based on the existing problem formulation, the results and discussions regarding the feasibility and effectiveness of the E-Module for element 3 of Phase E in the Basics of Marketing subject at SMK are described as follows:

1. Feasibility Assessment of Sigil Software Assisted E-modules by Experts

Based on the results of product validity, which has been conducted by a group of experts including material experts, involving teachers specialized in digital business education, and undergraduate lecturers in commerce education; media experts, comprising undergraduate lecturers in educational technology; and linguists, consisting of undergraduate lecturers in language and literature education, all from Indonesia. Following the suggestions and input provided by experts during the review and validation process, product enhancements and adjustments were implemented before field trials commenced. The validation results indicate that the e-module for element 3 of the Basics of Marketing subject has achieved a very feasible status. Consequently, it can be utilized as teaching material during the learning process and as an independent learning resource for students.

Table 4. Recaptulation of Validator feasibility results

No.	Validator	Percentage	Criteria
1.	Materials Expert	97.50%	Very Worth It
2.	Media Expert	88.57%	Very Worth It
3.	Linguist	97.33%	Very Worth It
Average		**94.45%**	**Very Worth It**

Based on Table 5 above, the expert assessment indicates that the material received an evaluation of 97.5%, categorized as "very worthy." Some suggestions and input were provided, including the use of suitable examples in the material, additional illustrations in certain sections to enhance engagement, and expanding the reference material. With the development of this e-module, it is anticipated to assist participants in comprehensively understanding the material and enhancing the quality of learning (Hirzan & Yuhendri, 2020). The study on e-module development also received a validation score of 93%, categorized as "worthy," indicating that the e-module can stimulate, cultivate, and fortify interest and enthusiasm for independent learning among participants. The revisions and suggestions provided by material experts are as follows.

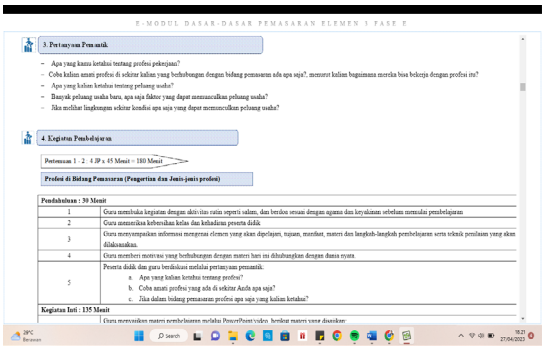


Figure 2. View before revision

Figure 3. View after revision

Meanwhile, the assessment by media experts yielded a score of 88.57%, meeting the criteria for being considered very feasible. Suggestions and inputs obtained from media experts include adding a digital version link of the participant's worksheets to facilitate their work, using more contrasting colors to make the material more visually appealing, and adjusting the cover image to relate it to the profiles of work in the field of marketing. This is because media plays a crucial role in product development, encompassing display, text, images, videos, and functionality, all of which can captivate students' interest and enthusiasm for learning (Firmansyah, 2021) With media equipped with learning videos, images, and exercise questions, participants are aided in their

studies and can better comprehend the material according to their abilities (Puspasari, 2022). Thus, in this research development, learning videos, images, and exercise questions are presented to assist participants in their learning process. Furthermore, the media ensures content accuracy, provides examples and animations, and boasts an attractive design to prevent boredom (Nurmala et al., 2021), Consequently, the media effectively communicates the material visually and generates participants' interest in learning (Fatikhah & Anggaryani, 2022). Engaging media fosters participants' enthusiasm for learning (Azhar, 2014), as visual animation media designs work optimally to capture participants' attention (Rafmana & Chotimah, 2018). The revisions suggested by media experts are as follows.

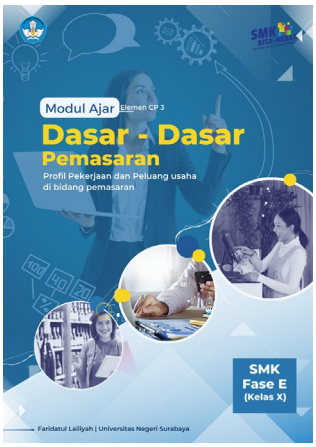


Figure 3. View before revision

Figure 4. View after revision

The evaluation by the language expert yielded a score of 97.3%, meeting the criteria for being considered very feasible. Suggestions and inputs from the language expert included improvements in spelling, the use of punctuation, and the necessity of introducing sub-chapters before delving into the conveyed points. The validation results from the language expert indicate that the choice of words and sentence structures align with the developmental level of the participants, ensuring easy comprehension (Prastowo, 2014). The development study of the e-module with the assistance of Sigil software further validated the language aspect, achieving a validation score of over 80%, thus ensuring that the language used is easily understood by the participants (Munandar et al., 2021).

Therefore, the experts' assessment resulted in an average feasibility score of 94.45%, falling within the "very worthy" criteria. Consequently, the e-module has fulfilled the conditions to be used as teaching material in the learning process, benefiting both teachers and participants. The e-module has been validated by experts with a score of 92.85%, facilitating field testing and supporting the learning process (Munandar et al., 2021). The validation process by experts is a crucial stage in this study to determine the appropriateness of the product before proceeding to testing. In other words, the validation results provide insights into the level of appropriateness of

the developed products. Another study that tested e-modules with Sigil software in learning mathematics also received validation regarding the appropriateness of content, language, and presentation (Fitri et al., 2021). Thus, the e-module developed in this study is deemed suitable for use as teaching material in element 3 of the Marketing Basics lesson.

2. Effectiveness of *E-modules* Assisted by Sigil Software

The effectiveness of the product was measured through testing carried out on participants in Class X Vocational School Digital Business, consisting of 32 students. The testing process began with administering a pretest before the learning session and a posttest after the learning session. Participants then provided answers on the provided answer sheets. The average scores of the 32 students demonstrate an increase, as presented in the following table:

Table 5. Average Pretest and Posttest Scores

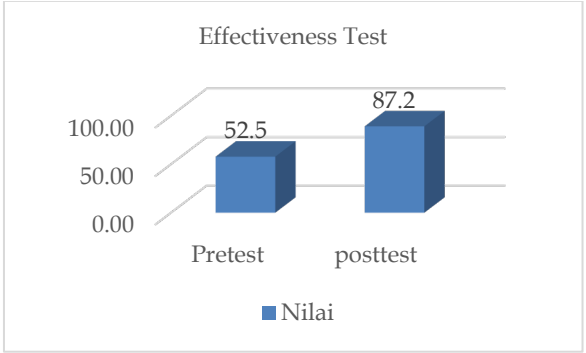
Results	Mark	
	Pretest	***posttest***
Final score	1680	2790
Average	52.5	87.2
Maximum score	100	100

Next, to determine the level of effectiveness of using *the e-module* being developed, a calculation was carried out using the N-Gain score as follows.

$$g = \frac{87{,}2 - 52{,}5}{100 - 52{,}5}\ x\ 100 = 0{,}73$$

The calculation results show that the N-Gain score value is 0.73, indicating the product's effectiveness at a high level, given that the value is greater than 0.7. The following is a comparison of the average values of the pretest and posttest results.

Chart 1. Improving Student Learning Outcomes



From the chart above, it can be concluded that there is a significant increase in student learning achievement. Therefore, the product developed in the form of an e-module using Sigil software for element 3 of phase E in the Basics of Marketing subject can be considered effective with a high level of effectiveness. The existence of this e-module can facilitate their learning process and enhance learning outcomes through the utilization of material presented in video format, which can stimulate enthusiasm (Made et al., 2021). Additionally, the support of visual media in the form of learning videos and images presented can further elevate students' interest in learning and foster enthusiasm in utilizing Android devices for learning (Yektyastuti & Ikhsan, 2017). The students' learning results can serve as a gauge to determine the effectiveness of the products being developed. This aligns with research by Taufik (2018) which demonstrates that the effectiveness test of the developed e-module achieved an N-Gain score of 0.87, falling within the high category. This indicates that the e-module is capable of enhancing students' attainment of knowledge competencies. However, even if the effectiveness test results yield an N-Gain score of 0.6, categorized as medium, it still signifies an improvement and influence on student learning outcomes (Munandar et al., 2021). Apart from that, in another study by Wati et al (2021), the effectiveness test results of the developed e-module exhibited an N-Gain score of 0.59 in the medium category, yet it still succeeded in enhancing student learning outcomes.

CONCLUSION

In this research, the product produced is an e-module using Sigil software for element 3 of the E phase of the Basics of Marketing subject. The development of the e-module followed the ADDIE (Analyze, Design, Development, Implementation, Evaluation) development model. Following validation or feasibility assessment, the e-module achieved an average validation result of 94.5%, meeting the criteria for being considered very feasible. Meanwhile, the average student response to this e-module was 89.4%, indicating highly feasible criteria. The results of testing the effectiveness of using the e-module with Sigil software for element 3 of the E phase of the Basics of Marketing subject showed a value of g=0.73, indicating its high-level effectiveness criteria. Therefore, the e-module is considered suitable and can be utilized as a learning reference in schools.

The implication of developing this e-module is that it can be utilized by students for independent study and as an alternative to readily accessible open materials, which can be accessed via laptops, personal computers, or smartphones. This e-module teaching material can be incorporated into learning activities and serves as a complement to vocational school teachers' learning tools, particularly in the Merdeka curriculum for the Basics of Marketing subject.

REFERENCES

Ahmadi, Lif Khoiru, dkk. (2011). *Strategi Pembelajaran Sekolah Terpadu*. Prestasi Pustaka Publisher.

Amalia, F., & Kustijono, R. (2019). Efektifitas Penggunaan E-Book dengan Sigil untuk Melatihkan Kemampuan Berpikir Kritis. *Prosiding Seminar Nasional Fisika (SNF)*, *1*(November), 81–85.

Andiyanto, C., Hawanti, S., & Kuntoro, K. (2021). Pengembangan E-Modul Pengayaan Materi Debat Berbasis Software Sigil untuk Pembelajaran Bahasa Indonesia Kelas X SMA di Purbalingga. *Metafora: Jurnal Pembelajaran Bahasa Dan Sastra*, *8*(2), 111. https://doi.org/10.30595/mtf.v8i2.12411

Andri, R. M., Universitas, D., & Utara, T. (2017). *Peran dan fungsi teknologi dalam peningkatan kualitas pembelajaran*. *3*(1).

Anwar, I. (2010). *Pengembangan Bahan Ajar Bahan Kuliah Online*. Direktori UPI.

Arikunto, S. (2013). *Dasar - Dasar Evaluasi Pendidikan*. PT Bumi Aksara.

Azhar, A. (2014). *Media Pembelajaran*. Rajawali Pers.

Branch, R. (2009). *Instructional Design : The ADDIE Approach*. Spinger Science & Business Media. https://doi.org/10.1007/978-0-387-09506-6

Daryanto, A. D. (2014). *Pengembangan Perangkat Pembelajaran (Silabus, RPP, Bahan Ajar(*. Gava Media.

Fatikhah, F. F., & Anggaryani, M. (2022). *Development of Articulate Storyline -based Dynamic Fluid Learning Media For Grade XI High School Students*. *6*(16), 26–34.

Firmansyah. (2021). *Pengembangan E-Modul Mata Pelajaran Matematika Untuk Meningkatkan Prestasi Belajar Siswa Kelas VIII Di SMP Negerei 9 Pagar Alam*. *11*(1), 157–168.

Fitri, A., Andriani, S., Studi, P., & Matematika, P. (2021). *Sigil Software sebagai Pengembangan E-Modul Pembelajaran Matematika 1,2,3*. *7*(May), 1–10.

Hake, R. R. (1999). *Analyzing Change/Gain Scores*.

Hirzan, L., & Yuhendri, M. (2020). *Pengembangan E-Modul Mata Pelajaran Instalasi Penerangan Listrik untuk Pembelajaran Daring*. *01*(01), 142–146.

Intan, N. (2019). *Cara Membuat Ebook dengan Sigil*. Deepublish.

Kemdikbud. (2022). *Salinan Keputusasan Kepala Badan Standar, Kurikulum, Dan Asesmen Pendidikaan Kementrian pendidikan, Kebudayaan, Riset, Dan Teknologi Nomor 033/H/KR/2022*.

Kunandar. (2011). *Penelitian Tindakan Kelas*. Raja Grafindo Persada.

LPMP Jatim. (2018). *Membuka Cakrawala Dunia Sejak Dini*.

Made, N., Candra, L., Agung, I. G., & Negara, O. (2021). *Meningkatkan Semangat Belajar Siswa Melalui Video Animasi IPA pada Pokok Bahasan Sistem Pernapasan Kelas V*. *8*(1), 122–130.

Malik, A. S. (2021). Pengembangan E-Modul Berbantuan Sigil Software Dan Analisis Kemampuan Berpikir Kritis Siswa. *Pasundan Journal of Mathematics Education : Jurnal Pendidikan Matematika*, *11*(Vol 11 No 1). https://doi.org/10.23969/pjme.v11i1.3731

Munandar, R. R., Cahyani, R., & Fadilah, E. (2021). Pengembangan E-Modul Sigil Software Untuk Meningkatkan Hasil Belajar Siswa Di Masa Pandemi Covid-19. *Biodik*, *7*(4), 191–202. https://doi.org/10.22437/bio.v7i4.15204

Muyaroah, S., & Fajartia, M. (2017). *Pengembangan Media Pembelajaran Berbasis Android dengan menggunakan Aplikasi Adobe Flash CS 6 pada Mata Pelajaran Biologi Abstrak*. *6*(2301), 79–83.

Natshia, H., & Abadi, M. (2022). Analisis Strategi Guru Bahasa Indonesia dalam Implementasi Kurikulum Merdeka. *Basastra: Jurnal Kajian Bahasa Dan Sastra Indonesia*, *11*(3), 227–245.

Nurmala, S., Triwoelandari, R., & Fahri, M. (2021). *Pengembangan Media Articulate Storyline 3 pada Pembelajaran IPA Berbasis STEM untuk Mengembangkan Kreativitas SiswaSD/MI*. *5*(6), 5024–5034.

Pangaribuan, P. (2018). *Tantangan Revolusi Industri 4.0 Untuk SMK*.

Prastowo, A. (2014). *Panduan Kreatif Pembuatan Bahan Ajar Inovatif*. Diva Press.

Puspasari, D. (2022). Pengembangan Bahan Ajar Interaktif Sigil pada Materi Komunikasi Efektif Kehumasan di SMKN 2 Buduran Sidoarjo. *Jurnal Pendidikan Tambusai*, *6*, 10311–10322.

Rafmana, H., & Chotimah, U. (2018). *Pengembangan Multimedia Interaktif Berbasis Articulate Storyline Untuk Meningkatkan Motivasi SMA Srijaya Negara Palembang*. 52–65.

Riduwan. (2015). *Skala Pengukuran Variabel-Variabel Penelitian*. Alfabeta.

Taufik, S. (2018). *Pengembangan E-Modul Berbasis Web Untuk Meningkatkan Pencapaian Kompetensi Pengetahuan Fisika Pada Materi Listrik*. *3*(2), 51–61.

Umiyatun, Purnomo, M. E., & Indrawati, S. (2020). *Moodle Based Worksheet on Scientific Article Writing : A Students*. *10*(1), 117–132. https://doi.org/10.23960/jpp.v10.i1.202013

Wati, M., Apriani, R., Miriam, S., & Mahtari, S. (2021). *Pengembangan E-Modul Suhu Dan Kalor Bermuatan Pendahuluan Perkembangan teknologi telah merambah luas sehingga dapat memengaruhi berbagai bidang*. *8*(1), 112–121.

Yektyastuti, R., & Ikhsan, J. (2017). *Pengembangan Media Pembelajaran Berbasis Android pada Materi Kelarutan untuk Meningkatkan Performa Akademik Peserta Didik SMA Developing Android-Based Instructional Media of Solubility to Improve Academic Performance of High School Students*. *2*(1), 88–99.