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Development of E-Module Materials of Quantities and Units Using Canva to Increase Students' Interest in Learning

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Abstract

This study aims to determine the characteristics and feasibility of developing an e-module using the Canva application to increase the learning interest of high school students. This research is a follow-up research that has been done previously which is only limited to the analysis stage, this research uses the ADDIE model RnD method. But in this research, it is only up to the development stage. This study uses an expert validation sheet assessment instrument that contains aspects of material, language and media. Based on the results of product validation tests that were validated by experts so that the percentage score for the material aspect was 85.45%, language was 87.50%, media was 89.58%, and interest in learning was 90.63%. The final result of the average score is 88.28%, can be categorized as very valid and the results of the student's perception response show very well with a percentage of 86.23%. Therefore, the e-module material of magnitude and unit using Canva to increase the learning interest of high school students is declared as a product that is feasible to use.

Keywords: canva, e-modules, learning interest, learning media, quantitie and units

A. Introduction

Education is the learning of skills, knowledge, and habits that have been passed down from generation to generation by a group of people through training, teaching, or research [1]. Education is also a necessity for every human being [2]. Today's educational institutions and teachers face increasingly demanding demands, especially in preparing students to face the dynamics of the rapidly changing dynamics, especially in 21st century education [3]. Changes that occur in 21st century education are related to the development of science and technology. Educational Technology can generically be interpreted as the application of technology for educational activities. Based on this estimate, educational technology can be interpreted as a logical, scientific, and systematic approach to educational activities [4]. Educators need to understand that the professionalism of a 21st century educator is more than just subject-specific expertise. Instead, they must be experts in discovering with students, know how to collaborate, and be experts in discovering new discoveries with students in every learning process [5].

Education 4.0 is a response to the need for the Industrial Revolution 4.0, because now humans and technology combine to create new opportunities in innovative and creative ways [6]. Currently, the development of educational technology is changing very quickly, especially in the field of education. In the world of education for the application of ICT, it often faces many obstacles, including: the lack of procurement of ICT infrastructure in various regions, the use of used technical equipment, legal instruments in the field of ICT are still minimal, and the cost of procurement is expensive and uses. As a condition for achieving the application of ICT for the learning process, there are several ICT facility solutions that are used, namely: teachers and students must be able to use digital technology and the internet in schools, interactive learning materials using laptops/computers, teachers must have the competence and skills to use digital devices and must have an adequate budget for the procurement, maintenance and development of infrastructure facilities, as well as maintaining infrastructure facilities as well as support from school principals, teachers, and students in the application of ICT learning [7].

The Covid-19 pandemic has hit countries in the world including Indonesia with a considerable impact in various fields including education [8]. To keep learning during the COVID-19 pandemic, schools can apply various methods such as implementing online and offline learning. The learning objectives that want to be communicated are sometimes not achieved properly, but it is hoped that from this process

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students can embrace learning both online and offline. Including the school's efforts to educate students [9].

The 2013 curriculum requires students to have scientific work competencies, which include formulating problems, proposing and testing hypotheses, determining variables, designing and conducting experiments, collecting and processing data, drawing conclusions, and communicating orally and in writing [10]. However, the COVID-19 pandemic had a very bad impact on the implementation of the 2013 curriculum.

Effective learning is learning that allows students to learn easily and fun and achieve their learning goals as intended, and of course also related to the use of interesting learning media in the learning process [11]. One of them contains a presentation whose module is converted into electronic media, in this case the module is capable and can be accessed effectively anywhere, so the term electronic module or commonly called e-module was born [12]. E-modules are arranged systematically and presented in electronic form [13]. Compared to textbooks, this module has advantages as teaching materials. Its strength lies in two-way communication, available for distance education and training, interactive dialogue, clearly structured, friendly and motivating, applying newly acquired knowledge and skills, material is divided into small pieces, there are assignments and feedback [14]. Modules are usually printed, and don't look appealing to students. There needs to be an electronic module (E-module), so that students can learn interactively.

Learning media is a useful tool in teaching activities [15]. Learning media using gadgets has the opportunity to help improve the quality of student performance in the form of learning outcomes. Learning media using Android allows learning regardless of time and place, with interesting applications [16]. Canva is one of the many apps that teachers can use as a medium of learning. There are many advantages to using Canva to create learning media, namely; by using Canva, we can create various types of designs that are equipped with various animation features, templates and page numbers to encourage teacher and student creativity and time efficiency in media (in slides), mind maps and posters [17].

Based on the results of observations and needs analysis at SMAN in Payakumbuh City, namely SMA N 1 Payakumbuh, SMA N 3 Payakumbuh and SMA N 5 Payakumbuh, it shows that students have not used media-based teaching materials such as digital modules or e-modules, print media are teaching materials. the most frequently used. Some students of class X said that they wanted to use electronic teaching materials in their learning, because they did not understand physics (the material was too difficult to understand). They need more electronic teaching tools, so that they can better understand the lessons given by their teachers.

With the development of technology in all fields, the definition of a module is no longer only limited to printed teaching materials but can also be in the form of electronic teaching materials. Adding audio-visual content to teaching materials makes it more interesting for students. Creating such content requires a lot of skill and expertise in creating interesting learning media. One tool that might be an alternative is Canva. Canva is a free and paid online application that is great for creating learning media. Visit www.canva.com to use the Canva website. Canva has many templates available for infographics, graphics, posters, presentations, brochures, logos, resumes, flyers, A4 documents, Instagram posts, cards, newspapers, comics, magazine covers, invitations, photo collages, business cards, desktop wallpapers, reports , certificates, book covers, social media animations, announcements, menus, videos, graphic organizers, your stories, letters, letterhead, proposals, labels, worksheets, class schedules, calendars, identity cards, CD covers, US mail documents, mobile -first presentation, planner, program, ebook cover and storyboard [18]. Distance learning forces physics educators to prepare materials that increase student interest in learning. Therefore, physics subjects must have skills in developing more creative and innovative physics teaching materials to increase students' interest in learning physics during the outbreak. One of the innovations in developing teaching materials can be in the form of electronic modules. Using the Canva app, educators can create more engaging e-modules to increase student interest in distance learning.

This E-module Material Quantity and Unit Using Canva to Increase Student Interest in Learning is a very supportive learning medium to be used both online. And because the form is very interactive and interesting because it provides various elements such as learning videos and 3D displays that can clarify and support the material in the module. Therefore, it feels right to choose e-modules as an alternative solution from learning resources that are integrated with various electronic advantages in packaging

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material content (integrated with images, animations, videos, and simulations) and can be accessed anytime and anywhere with the help of a network. internet (website).

Shows that the mathematics-based e-module developed is valid, practical and relevant research includes Canva-based E-Module Development research on Mathematics Learning in the Covid-19 Pandemic Period with effective research and development results [19]. This research is also supported by research entitled Development of Basic Chemistry Practicum E-module Using Canva Design Application with the results showing that the e-module for basic chemistry practicum is good and suitable for teaching materials in the online learning process [20]. In addition, research on the use of Canva as an E-Module for Mathematics Learning on Students' Interest in Learning with the results showed that through e-module Mathematics subjects were interesting so that they could strengthen students' interest in learning during the distance learning process [21].

Based on the results of previous research, through interview data collection techniques, questionnaires and observations carried out at the Payakumbuh High School level, some information was obtained about students' difficulties in studying quantity and unit material, including: 1) Students feel bored, the material is more difficult to understand. This is studied because the media used is not interesting and monotonous; 2) Electronic modules are never given during the learning process; 3) Students want interesting teaching materials, complete with videos, animations, sounds, etc. In solving these problems, one solution that can be used is to use Canva to develop teaching materials in the form of electronic modules, and it is also concluded that the results of the analysis of the need for electronic modules for the material of quantities and units at the Payakumbuh High School level show that students and physics teachers strongly agree that the e-module learning media with material quantities and units really needs to be developed to support effective learning both online and offline.

Therefore, based on the description above, a research was carried out with the title "Development of an e-Module on Quantities and Units Using Canva to Increase High School Students' Interest in Learning. The formulation of the problem is: 1) How is the feasibility of the e-module for quantity and unit material using Canva to increase student interest in learning and 2) Knowing teacher and student perceptions of the e-module material for quantity and unit using Canva to increase student interest in learning.

B. Research Methods

This study adopts the ADDIE model research method, which is divided into several stages, namely analysis, design, development and implementation, and evaluation. However, this research is limited to the developmental stage. The ADDIE model is a model commonly used in teaching development, various forms of product development can also be used such as learning methods, models, learning strategies, teaching materials and media [22]. This research was conducted to continue the previous research which was limited to the analysis stage. The next stage is the development stage, namely the development so that the media can be accessed via a website or link, with an attractive display, video, audio and 3D display as supporters. In addition, a product feasibility validation test was carried out by material, media and language experts, then modifications/revisions were carried out, and the next test of student perceptions of the teaching materials developed was an electronic module (e-module) with material quantities and units using Canva to increase student interest in learning for high school students.

The subjects of this study were students in SMA 1 Payakumbuh, SMA 3 Payakumbuh, and SMA 5 Payakumbuh with a total of 102 students as respondents [23].Visually, the various stages of the ADDIE model can be seen in Figure 1 below.

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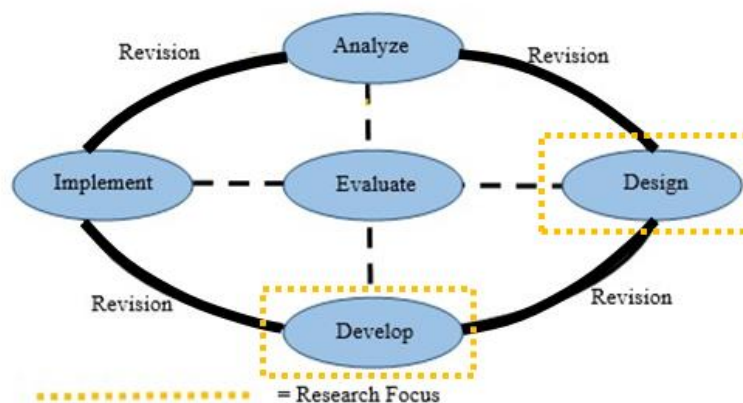
Figure 1. ADDIE Model Development Design

This research was conducted in Payakumbuh City, West Sumatra province from March - June 2022 with the research subjects and the population taken in this study were students of class X Mathematics and Natural Sciences in 3 high schools, namely SMA 1 Payakumbuh, SMA 3 Payakumbuh, and SMA 5 Payakumbuh. The sampling technique used is purposive sampling with the sample taken is 102 students X MIPA. Data collection techniques in this study are using observations, interviews and questionnaires. This development was made as an alternative to the impact of COVID-19 in the world of education, especially in the development of electronic-based media. The data collection instrument uses a questionnaire that will be analyzed to determine the feasibility and responses of students' perceptions as a consideration for the E-Module media so that it is feasible to apply. After data analysis, the products are improved and updated by revising the developed products. The feasibility questionnaire was filled by a physics lecturer at Bengkulu University and a high school physics teacher with three aspects, namely aspects of presentation, content, media, and language. Furthermore, the calculation of each item statement is carried out.

Expandable interval data can be analyzed by calculating the percentage of respondents for each item in the questionnaire. The formula used is as follows:

$$P = \frac{n}{N} x \; 100\% \tag{1}$$

where P is the percentage of validation test results, n is the total score of expert judgment, and N is the score maximum possible gain [24]. In addition, the percentage of eligibility obtained is then interpreted as a qualification category according to Table 1.

Table 1. Validity Result Criteria

Percentage	Interpretation
0% - 25 %	Not very good
26 % - 50 %	Not good
51% - 75 %	Good
76% - 100 %	Very good

From the interpretation of the data, the Canva-based E-Module learning media can be said to be successful and valid or very valid if the questionnaire data processing results in a score between 51% to 100% or is in the "Good" and "Very Good" criteria. After validation, a perception test was conducted using a student response questionnaire.

C. Results and Discussion

Needs Analysis Phase

Based on research that has been done previously, entitled Analysis of Needs for Development of E-Module Material Quantities and Units at the Payakumbuh High School Level, the research uses development research steps with the ADDIE model which has several stages, namely Analysis, Design,

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Development & Implementation, and Evaluation. The research is limited to the analysis stage which is intended only as initial information for further research. The results of previous research through interview data collection techniques, questionnaires and observations concluded that students and physics teachers strongly agreed that the e-module learning media with material quantities and units really needed to be developed to support effective online and offline learning. This is evidenced by the results of the needs analysis in 5 Payakumbuh High Schools that obtained the percentage results of 89.00% of teachers and 84.60% of students with details of 8 physics teacher respondents there are 6 teachers strongly agree and 2 teachers agree and as for 250 students , there are 222 students strongly agree and 28 students agree [25].

Design Phase

The results of the design stage, namely the product design stage after the initial needs analysis, which shows the need for the development of physics e-modules on the concept of quantities and units for high school students. At this stage the researcher prepares whatever is needed in the manufacture of electronic teaching materials in the form of electronic modules (e-modules). This e-module uses the Canva application that can help showcase learning that can increase student interest in learning. Based on the design, the E-module is composed of: cover, table of contents, glossary, concept map, introduction, description, instructions for use, learning activity 1 & learning activity 2, learning materials, material summary, practice questions 1 & 2, evaluation, assessment self, answer key, bibliography and author's identity.

Development Phase

At this stage of development, the physics module using Canva material quantities and units is arranged as shown in the image below:

At the beginning of the module there is a cover containing the cover of the electronic module, table of contents, glossary, bibliography, introduction (identification of electronic modules and basic competencies), description and instructions for use.
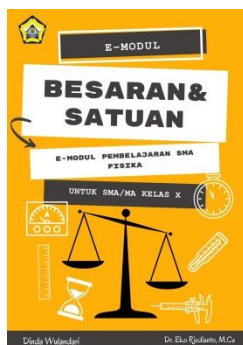

Figure 2. Cover E-Module

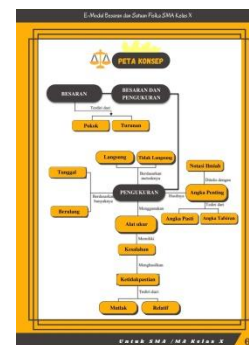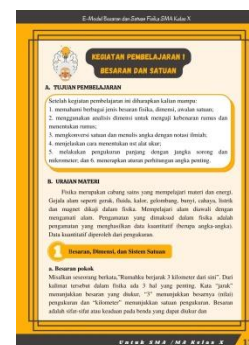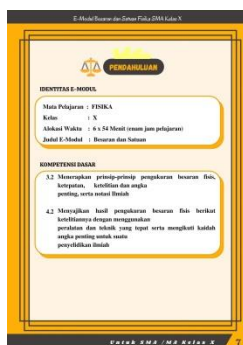**Figure 3.** List of contents

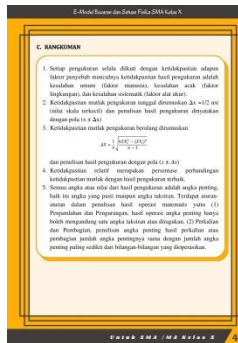**Figure 4.** Glossary

Figure 5. Concept maps

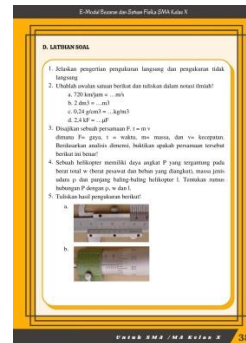**Figure 6.** Introduction (E-Module Identity and Basic Competencies | **Figure 7.** Description | **Figure 8.** Instructions for use | **Figure 9.** Learning Activities (Objectives and Material Descriptions)

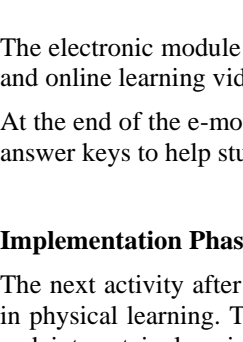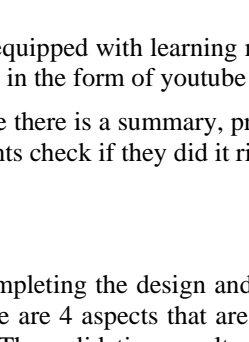**Figure 10.** Display of Learning Materials (Learning videos and 3D image display) | **Figure 11.** Summary | **Figure 12.** Exercises
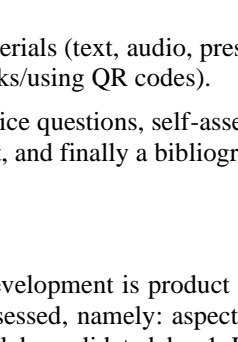

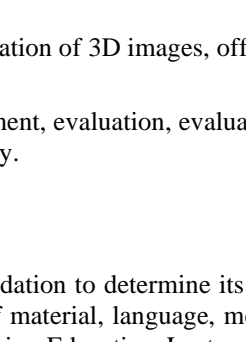**Figure 13.** Self-assessment | **Figure 14.** Evaluation | **Figure 15.** Evaluation Answer Key | **Figure 16.** Bibliography

The electronic module is equipped with learning materials (text, audio, presentation of 3D images, offline and online learning videos in the form of youtube links/using QR codes).

At the end of the e-module there is a summary, practice questions, self-assessment, evaluation, evaluation answer keys to help students check if they did it right, and finally a bibliography.

Implementation Phase

The next activity after completing the design and development is product validation to determine its use in physical learning. There are 4 aspects that are assessed, namely: aspects of material, language, media and interest in learning. The validation results will be validated by 1 Physics Education Lecturer at Bengkulu University and 1 teacher, see Table 2 for more details.

Table 2. Validator Field

Validator	Skill	Position
V1	Physicist	Bengkulu University Lecturer
V2	Practitioner	Teacher of SMA N 3 Payakumbuh

In terms of material, language, media and learning interest in electronic learning modules using Canva, the validation results can be seen more clearly in Tables 3, 4, 5, and 6 below:

Table 3. Validity Test Results on Material Aspects

Validator	Score	Maximum Score	Percentage	Category
Expert 1	21	24	88%	Very good

| Expert 2	20	24	83,33%	Very good

Table 4. Validity Test Results on Language Aspects

Validator	Score	Maximum Score	Percentage	Category
Expert 1	11	12	91,66%	Very good
Expert 2	10	12	83,33%	Very good

Table 5. Validity Test Results on Media Aspects

Validator	Score	Maximum Score	Percentage	Category
Expert 1	21	24	87,5%	Very good
Expert 2	22	24	91,67%	Very good

Table 6. Validity Test Results on Aspects of Learning Interest

Validator	Score	Maximum Score	Percentage	Category
Expert 1	15	16	93,75%	Very good
Expert 2	14	16	87,50%	Very good
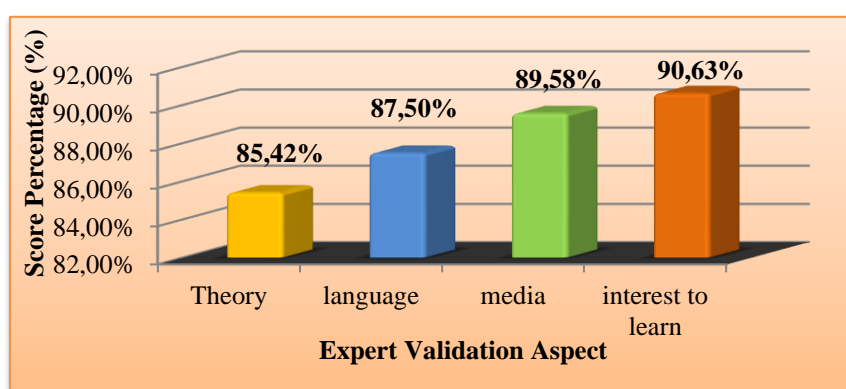
Figure 17. Final Result of Module Feasibility Validation by Expert

The purpose of this study was to determine the results of the feasibility test and students' perceptions of the material and units of physics textbooks in the form of electronic modules developed using Canva. To develop this product, the steps of the Addie model in the R&D research method were used. The stages of research carried out in this study are: 1) Analysis in the form of analyzing the needs of teachers and students for the product; 2) Design, in the form of design, data collection, and design of teaching materials and manufacture of electronic teaching materials; and 3) Develop, the stage after the design is carried out in the form of product development. 4) Implementation, this stage aims to determine the feasibility of the product that has been developed and then tested for readability. The final result of this research is an electronic teaching material using Canva on the material of quantities and units.

To develop this product, the steps of the Addie model R&D research methodology were used. The stages of research that have been carried out in this study are: 1) Analyzing product needs in the form of analysts; 2) Design, in the form of designing teaching materials, collecting data, designing and producing electronic teaching materials; 3) Based on the designed product Develop in the form of development. 4) Implementation, this stage aims to determine the feasibility of the product that has been developed, followed by a readability test. The final result of this research is an electronic textbook about the amount and unit of material using Canva.

From Figure 17, it can be seen that the average percentage of product validation/feasibility results is 88.28% with very feasible criteria. This means that the developed product can be implemented in physics learning. The development of the media that has been made will also be tested for students' perceptions. The perception test was carried out in March 2022 using a questionnaire through a google form and a

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questionnaire sheet. The questionnaire used was taken from a thesis questionnaire that has been validated by experts. This perception test was followed by 102 students from the three research schools. Based on the results of tests on students in SMA N 1, SMA N 3 and SMA N 5 Payakumbuh, the percentage is 86.23% in other words it is very feasible to use.

So, from the percentage results obtained from the validation of material aspects, language aspects, media media aspects and learning interest aspects, it can be concluded that the E-module Material Quantities and Units Using Canva to Increase Student Interest in Learning is worthy of being used as a learning medium. E - modules can add insight for students when studying independently or with teachers. The product has been revised based on comments and suggestions that the media aspect is to reduce too much movement of text in the material section.

Relevant research includes research on Canva-Based E-Module Development in Mathematics Learning in the Covid-19 Pandemic Period with research and development results showing that the developed math-based e-modules are valid, practical and effective [19]. This research is also supported by research entitled Development of Basic Chemistry Practicum E-module Using Canva Design Application with the results showing that the e-module for basic chemistry practicum is good and suitable for teaching materials in the online learning process [20]. In addition, research on the use of Canva as an E-Module for Mathematics Learning on Students' Interest in Learning with the results showed that through e-module Mathematics subjects were interesting so that they could strengthen students' learning interest in distance learning [21].

D. Conclusion

The conclusion based on the results and discussion above is that the E-Module material of magnitude and unit using Canva to increase student interest in learning is very feasible to use, with an average percentage value of 88.28%. Based on the results of students' perceptions of the e-module, it can be said to be very good with a percentage of 86.23%. This study also continues the suggestions from previous research conducted by Rina Puspitasari who stated that further research can create modules whose learning videos can be directly opened via mobile phones [26]. Suggestions for further research can use the Canva application as a teaching material with different materials for research and development of e-modules.

E. Acknowledgement

References

[1] Helda yantl and Syahrani, "Standar Bagi Pendidik Dalam Standar Nasional pendidikan Indonesia," *J. Educ.*, vol. 1, no. 1, pp. 61–68, 2021.

[2] Oktaviani.J, "Supervisi Pendidikan Dalam Mewujudkan Tujuan Nasional Pendidikan Dan Meningkatkan Mutu Pendidikan," *Sereal Untuk*, vol. 51, no. 1, p. 51, 2018.

[3] A. Z. Izza, M. Falah, and S. Susilawati, "Studi Literatur: Problematika Evaluasi Pembelajaran Dalam Mencapai Tujuan Pendidikan Di Era Merdeka Belajar," *Konf. Ilm. Pendidik. Univ. Pekalongan 2020*, pp. 10–15, 2020, [Online]. Available: https://proceeding.unikal.ac.id/index.php/kip

[4] A. Akbar and N. Noviani, "Tantangan dan Solusi dalam Perkembangan Teknologi Pendidikan di Indonesia," *Pros. Semin. Nas. Pendidik. Progr. Pascasarj. Univ. Pgri Palembang*, vol. 2, no. 1, pp. 18–25, 2019.

[5] T. Blyznyuk, "Formation of Teachers' Digital Competence: Domestic Challenges and Foreign Experience," *J. Vasyl Stefanyk Precarpathian Natl. Univ.*, vol. 5, no. 1, pp. 40–46, 2019, doi: 10.15330/jpnu.5.1.40-46.

[6] F. Doringin, N. M. Tarigan, and J. N. Prihanto, "Eksistensi Pendidikan Di Era Revolusi Industri 4.0," *J. Teknol. Ind. dan Rekayasa*, vol. 1, no. 1, pp. 43–48, 2020, doi: 10.53091/jtir.v1i1.17.

JENTIK
Jurnal Pendidikan Teknologi Informasi dan Komunikasi

[7]   E. Prayitno, D. Kurniawati, and I. R. Arvianto, "Pemanfaatan Teknologi Informasi dan Komunikasi dalam Peningkatan Kualitas Pembelajaran," *Semin. Nas. Konsorsium UNTAG se Indones.*, pp. 401–414, 2018, [Online]. Available: http://jurnal.untag-sby.ac.id/index.php/semnasuntag/article/view/1689

[8]   I. A. Nafrin and H. Hudaidah, "Perkembangan Pendidikan Indonesia di Masa Pandemi Covid-19," *Edukatif J. Ilmu Pendidik.*, vol. 3, no. 2, pp. 456–462, 2021, doi: 10.31004/edukatif.v3i2.324.

[9]   R. E. Pratama and S. Mulyati, "Pembelajaran Daring dan Luring pada Masa Pandemi Covid-19," *Gagasan Pendidik. Indones.*, vol. 1, no. 2, p. 49, 2020, doi: 10.30870/gpi.v1i2.9405.

[10]   N. Shofia and S. W. , Ngurah Made Dharma Putra, "Analisis Konten Buku Teks Fisika SMA/MA Kurikulum 2013 pada Pokok Bahasan Alat Optik," *Unnes Phys. Educ. J. Terakreditasi SINTA 3*, vol. 8, no. 2, pp. 179–191, 2019, [Online]. Available: http://journal.unnes.ac.id/sju/index.php/upej%0AAnalisis

[11]   I. Junaedi, "Proses pembelajaran yang efektif," *J. Inf. Syst. Applied, Manag. Account. Res.*, vol. 3, no. 2, pp. 19–25, 2019.

[12]   T. R. Padwa and P. N. Erdi, "Penggunaan E-Modul Dengan Sistem Project Based Learning," *Jav. J. Vokasi Inform.*, vol. 1, no. 1, pp. 21–25, 2021, doi: 10.24036/javit.v1i1.13.

[13]   M. W. A. Pramana, I. N. Jampel, and K. Pudjawan, "Meningkatkan Hasil Belajar Biologi Melalui E-Modul Berbasis Problem Based Learning," *J. Edutech Undiksha*, vol. 8, no. 2, p. 17, 2020, doi: 10.23887/jeu.v8i2.28921.

[14]   M. S. A. Dewi and N. A. P. Lestari, "E-Modul Interaktif Berbasis Proyek terhadap Hasil Belajar Siswa," *J. Imiah Pendidik. dan Pembelajaran*, vol. 4, no. 3, pp. 433–441, 2020.

[15]   H. Hamid, Aisyah alberida, "Pentingnya Mengembangkan E-Modul Interaktif Berbasis Flipbook di Sekolah Menengah Atas," *EDUKATIF J. Ilmu Pendidik.*, vol. 3, no. 3, pp. 911–918, 2021, [Online]. Available: https://edukatif.org/index.php/edukatif/index

[16]   R. Muzijah, M. Wati, and S. Mahtari, "Pengembangan E-modul Menggunakan Aplikasi Exe-Learning untuk Melatih Literasi Sains," *J. Ilm. Pendidik. Fis.*, vol. 4, no. 2, p. 89, 2020, doi: 10.20527/jipf.v4i2.2056.

[17]   Tri Wulandari and Adam Mudinillah, "Efektivitas Penggunaan Aplikasi CANVA sebagai Media Pembelajaran IPA MI/SD," *J. Ris. Madrasah Ibtidaiyah*, vol. 2, no. 1, pp. 102–118, 2022, doi: 10.32665/jurmia.v2i1.245.

[18]   A. N. Alfian, M. Y. Putra, R. W. Arifin, A. Barokah, A. Safei, and N. Julian, "Pemanfaatan Media Pembelajaran Audio Visual berbasis Aplikasi Canva," *J. Pengabdi. Kpd. Masy. UBJ*, vol. 5, no. 1, pp. 75–84, 2022, doi: 10.31599/jabdimas.v5i1.986.

[19]   S. P. Pemimaizita, "Pengembangan E-Modul Berbasis Canva Pada Pembelajaran Matematika di Masa Pandemik Covid-19 Siswa Kelas XI MAN 1 Bungo," *Mat-Edukasia J. Pendidik. Mat.*, vol. 7, no. 1, pp. 15–21, 2022, [Online]. Available: https://garuda.kemdikbud.go.id/documents/detail/2753634

[20]   K. Puspita*, M. Nazar, L. Hanum, and M. Reza, "Pengembangan E-modul Praktikum Kimia Dasar Menggunakan Aplikasi Canva Design," *J. IPA Pembelajaran IPA*, vol. 5, no. 2, pp. 151–161, 2021, doi: 10.24815/jipi.v5i2.20334.

[21]   I. Irkhamni, A. Z. Izza, W. T. Salsabila, and N. Hidayah, "Pemanfaatan Canva Sebagai E-Modul PEMBELAJARAN MATEMATIKA TERHADAP MINAT BELAJAR PESERTA DIDIK," *Konf. Ilm. Pendidik. Univ. Pekalongan 2021*, no. ISBN: 978-602-6779-47-2, pp. 127–134, 2021.

[22]   T. D. Kurnia, "odel ADDIE Untuk Pengembangan Bahan Ajar Berbasis KemampuanM Pemecahan Masalah Berbantuan 3D," *Semin. Nas. Pendidik. Mat.*, vol. 1, no. 1, pp. 516–525, 2019.

[23]   E. Winaryati, M. Munsarif, M. Mardiana, and S. Suwahono, "RD&D Literature Review for Development of a Digital Platform for the Learning Supervision Evaluation Model (MESp)," *J. Pendidik. Sains*, vol. 9, no. 2, p. 181, 2021, doi: 10.26714/jps.9.2.2021.181-192.

[24]   S. Indah, R. Eko, and J. Henny, "Pengembangan Bahan Ajar Elektronik Menggunakan Flip PDF Professional pada Materi Alat-Alat Optik di SMA," *J. Kumparan Fis.*, vol. 2, no. 3, pp. 145–152, 2019.

[25]   R. Puspitasari, D. Hamdani, and E. Risdianto, "Pengembangan E-Modul Berbasis Hots Berbantuan Flipbook Marker Sebagai Bahan Ajar Alternatif Siswa Sma," *J. Kumparan Fis.*, vol. 3, no. 3, pp. 247–254, 2020, doi: 10.33369/jkf.3.3.247-254.

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