
DEVELOPMENT OF INTERACTIVE E-MODULES ASSISTED BY THE KVISOFT FLIPBOOK MAKER APPLICATION ON ALGEBRAIC FORMS GRADE VII

Ainun Fachrunisa¹, Tri Astuti Arigiyati¹ and Krida Singgih Kuncoro^{1*}

¹Mathematics Education, Universitas Sarjanawiyata Tamansiswa, Yogyakarta, Indonesia

*Correspondence purposes, email: krida.kuncoro@ustjogja.ac.id

Abstrak: Tujuan penelitian ini adalah untuk mengembangkan suatu produk media pembelajaran matematika yang dapat diakses melalui android dengan berbantuan aplikasi *Kvisoft Flipbook Maker*. Jenis penelitian yang digunakan dalam adalah *Research and Development* (R&D) dengan model penelitian 4-D Thiagarajan yang terdiri dari 4 tahap yaitu *Define, Design, Development, dan Disseminate*. Subjek penelitian ini adalah 10 peserta didik kelas VII SMP N 3 Bantul. Teknik pengumpulan secara deskriptif dan kualitatif. Berdasarkan hasil validasi ahli, media pembelajaran berbasis *e-modul* layak untuk digunakan dalam proses pembelajaran matematika dan termasuk dalam kategori sangat baik dengan persentase keidealan 90,85%. Hasil respons pendidik dengan persentase keidealan sebesar 87,5% dengan kategori sangat baik sedangkan hasil respons peserta didik dengan persentase keidealan sebesar 92% dengan kategori sangat baik. Hal ini menunjukkan bahwa media pembelajaran yang dikembangkan layak untuk digunakan dalam proses pembelajaran matematika dan produk media berbasis *e-modul* dapat dikembangkan lebih lanjut dalam proses pembelajaran untuk mendorong pendidik supaya lebih kreatif dan inovatif dalam menciptakan media yang menarik dan menyenangkan bagi peserta didik.

Kata kunci: *Pengembangan, E-modul, Aplikasi kvisoft flipbook maker, Bentuk aljabar.*

Abstract: The research objectives are to develop a mathematics learning media product that can be accessed via android with the help of the *Kvisoft Flipbook Maker* application. The type of research is *Research and Development* (R&D) with a 4-D Thiagarajan research model which consists of 4 stages (*Define, Design, Development, and Disseminate*). The subjects of this study were 10 students of class VII SMP N 3 Bantul. The collection technique is descriptive qualitative. Based on the results of expert validation, the e-module-based learning media is feasible to be used in the mathematics learning process and is included in the very good category with an ideal percentage of 90.85%. The results of the response of educators with the ideal percentage of 87.5% in the excellent category while the results of the responses of students with the ideal percentage of 92% in the excellent category. This shows that the learning media developed is suitable for use in the mathematics learning process and e-module-based media products can be further developed in the learning process to encourage educators to be more creative and innovative in creating interesting and fun media for students.

Keywords: *Development, E-module, Kvisoft flipbook maker application, Algebraic form.*

INTRODUCTION

The era of the industrial revolution 4.0 is where technology, information, and communication are developing rapidly (Mpungose, 2020; Yang et al., 2020). This has consequences and influences various fields, one of which is mathematics education (Attard & Holmes, 2019; Bergmann & Sams, 2014; Scherer et al., 2018). The process of learning mathematics includes ways to acquire, develop, and apply knowledge, including how to work, think, solve problems, and behave (Bicer et al., 2021; Siagan et al., 2019; Wilkinson, 2018). This process can enhance systematic, critical, and logical thinking skills, which are skills needed in the era of the industrial revolution 4.0 (Jugembayeva & Murzagaliyeva, 2021; Xu & Zhang, 2021). At the junior high school level in Indonesia, mathematics lessons have an orderly, systematic organization that studies numbers, logic, space, shapes, calculations, and reasoning on a subject matter.

Efforts that can be made to increase interest and learning outcomes are to use appropriate methods to encourage students to play an active role in the learning process (Khan et al., 2017). Fun learning can be the proper method to create an effective learning environment and create a pleasant atmosphere in the learning process so that students do not feel burdened (Shih & Tsai, 2017). The effort to maximize exciting teaching and learning activities between students and subject matter is in the form of electronic books (e-modules) (Istiqomah et al., 2018; Kuncoro & Arigiyati, 2020; Widyawati et al., 2019). One media that can be used to increase students' interest and learning activities is e-module media (Hamid et al., 2020). This e-module can reduce the level of boredom and provide conditions for students to be more relaxed in learning (Prinstin & Handayati, 2018).

E-module is a learning tool or tool that contains materials, methods, limitations, and evaluation methods designed systematically and attractively to achieve the expected competencies according to their level of complexity electronically (Murdianto et al., 2021; Rochsun & Agustin, 2020). E-module displays information in book format that is presented electronically and can be read using a mobile phone or computer (Handayani et al., 2021). To understand the material, students need to open interactive e-modules to understand the material so that they will be motivated to learn better and focus on completing practice questions in the form of a Quizizz. According to (Setiyani et al., 2022), the use of illustrated media in the form of this e-module can help students' learning process to be more active and skilled in solving the problems they face .

Based on the explanation of the problem above, it is necessary to find a solution immediately. One of them is by developing e-module learning media packaged innovatively and creatively. The development of e-module learning media is expected to increase students' motivation and interest in learning. From the description of the background above, the researcher is interested in conducting a

study with the title "Development of Interactive E-Modules Assisted by the Kvisoft Flipbook Maker Application on Algebraic Forms Grade VII."

The objectives of the research are (1) to develop e-module-based learning media with the Kvisoft Flipbook Maker application on the material of algebra for class VII SMP/MTs, (2) to determine the quality of e-module learning media using the Kvisoft Flipbook Maker application, and (3) to determine user responses to e-module learning media with the Kvisoft Flipbook Maker application on algebraic material for class VII SMP/MTs.

RESEARCH METHOD

This research is development research or R&D (Research and Development), which is used to create a particular product and test its effectiveness of a product. Sugiyono, (2015) argues that research and development is research that produces certain products and tests the product's effectiveness. The development model used in this study uses a 4-D model developed by Thiagarajan et al., (1974), divided into four stages, including Define, Design, Develop, and Disseminate.

This study's data collection techniques include 1) Product validation questionnaires by material experts and media experts conducted by lecturers and mathematics educators. Validation is carried out to assess the feasibility of the product, which consists of aspects of content, presentation, language, and visual appearance. 2) Student response questionnaires are used to determine student responses to the developed product, including media usability aspects.

Quantitative analysis is carried out to present and interpret data in the form of numbers using statistical techniques to describe and explain the research being studied. This study's qualitative descriptions of the products developed are e-module learning media assisted by the Kvisoft Flipbook Maker application based on instrument assessments from material expert validators, media experts, educators, and student responses. Quantitative data in the form of assessment scores, namely Very Good = 5, Good = 4, Enough = 3, Less = 2, Very Poor = 1. The data obtained by questionnaires is then converted into qualitative data by clarifying it into five intervals with an excellent category, good, enough, less, and very less.

The evaluation of the quality of e-modules assisted by the Kvisoft Flipbook Maker application consists of several aspects that material experts assess, media experts, educators, and students of class VII SMP, which are carried out based on input data from the assessment sheet with scores of 1, 2, 3, 4, 5 then converted from quantitative form to qualitative data.

RESULTS AND DISCUSSION

The product produced in this study is a learning e-module entitled “Development of Interactive E-Modules Assisted by The Kvisoft Flipbook Maker Application on Algebraic Forms Grade VII”. The production components are presented in the following figure.

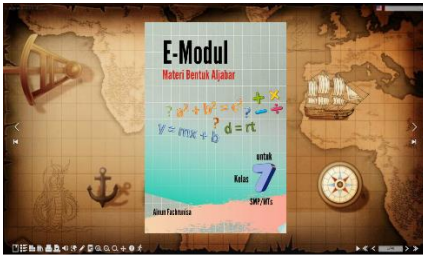


Figure 1. Front Cover View

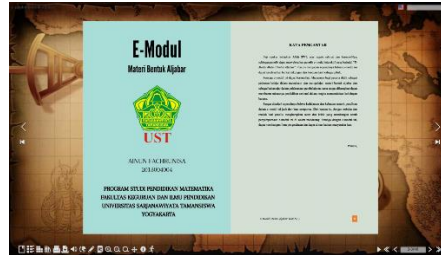


Figure 2. Second Cover View

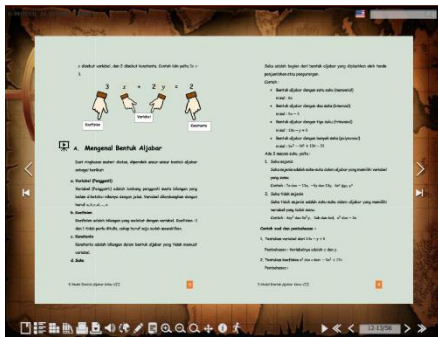


Figure 3. Material Display

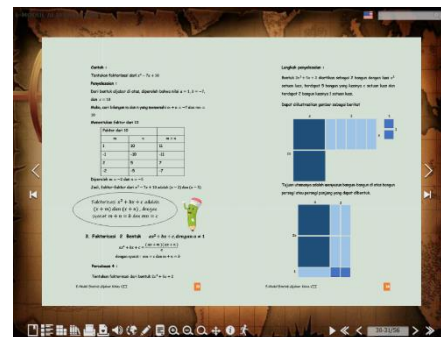


Figure 4. Material Display With Illustrations

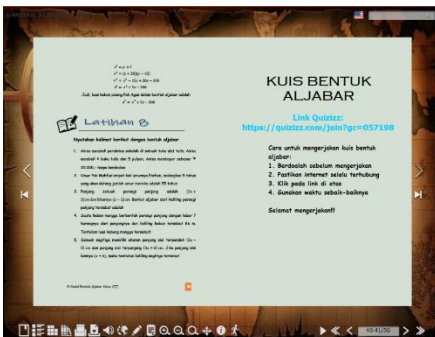


Figure 5. Practice and Quiz Online

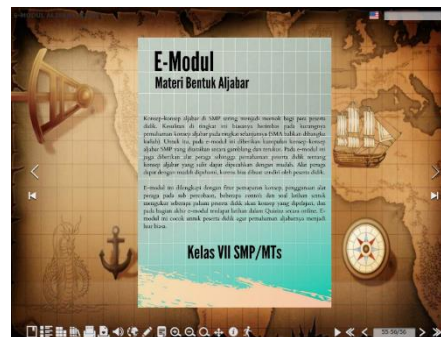


Figure 6. Back Cover View

1. Results and Discussion of Media Expert and Material Expert Validation

Based on the stages of research that have been carried out, this e-module learning media has been validated by material experts and media experts. The validation results obtained excellent categories from all aspects, including content feasibility, language feasibility aspects, visual display

feasibility aspects, and media usability aspects, so that they are feasible to use. The score obtained from material experts and media experts obtained an average of 4.47 with an ideal percentage of 90.85%. From the average and ideal percentage, the results obtained $\geq 81\%$ of all aspects in the excellent category.

2. Results and Discussion of Educator Response Questionnaires

The educator's response to the product was assessed using a questionnaire consisting of three mathematics educators. The assessment results from educators contain several aspects, including aspects of learning content with an average of 4.6 and an ideal percentage of 85%, aspects of eligibility for content with an average of 4 and an ideal percentage of 90%, aspects of language feasibility with an average of 4 and an ideal percentage of 90%, and aspects of the feasibility of visual appearance the mean is four and the ideal percentage is 85%. So from the results of the educator's assessment, it was obtained that the overall result with an ideal percentage of 87.5%, with an excellent category, so that the e-module is feasible to use.

3. Results and Discussion of the Student Response Questionnaire

The results of the student's responses to the product were assessed using a questionnaire consisting of 10 students. The results of the assessment from students contain several aspects, including content feasibility aspects with an average of 3.9 and an ideal percentage of 98%, language feasibility aspects with an average of 3.7 and an ideal percentage of 93%, aspects of the feasibility of visual appearance with an average of 3.7 and an ideal percentage 93%, and the media usability aspect with a mean of 3.9 and an ideal percentage of 92%. So from the student assessment results, it was obtained that the overall result of the average was 15.2 with a maximum score of 16 and the ideal percentage of 92% in the excellent category so that the e-module was feasible to use.

The e-module learning media assisted by the Kvisoft Flipbook Maker application on algebraic material for class VII SMP/MTs went through four stages (Figure 1).



Figure 7. Thiagarajan 4D Development Stage

1. Defining

At this stage, several steps were carried out, including a needs analysis by conducting observations and interviews with educators and students, analyzing the mathematical syllabus,

analyzing the needs of students, and analyzing the literature study of printed module teaching materials.

2. Design

Several steps are carried out at this stage, including choosing the format by designing the content, approach, and learning resources. The media selection stage determines the suitable media to be developed, and the initial design stage, namely designing e-modules using Canva software.

3. Development

At this stage, the limitation of media assessment instruments is carried out according to the media's assessment capacity. A Peer Reviewer carries out the first product assessment from colleagues. After receiving input from the Peer Reviewer, an assessment is carried out by the supervisor, including improving the appearance of the concept map, adjusting letters, making the font type equal, and adding distinct icons to each subtitle. After receiving input, the product is then assessed by educators and grade VII students.

4. Disseminate

This stage is carried out by researchers using a limited distribution due to the limitations of the researcher. At the dissemination stage, it goes through several stages, namely validation testing, packaging, diffusion, and adoption. At the validation testing stage, after the media was validated by material and media experts and there was a revision for product improvement, this stage was carried out to determine the effectiveness of the product developed through a product assessment in the form of a questionnaire by mathematics educators and seventh-grade students of SMP/MTs.

The e-module learning media assisted by the Kvisoft Flipbook Maker application on algebraic form material for class VII SMP/MTs is a learning media made using Microsoft Word software and continues with the customizing process using Kvisoft Flipbook Maker Pro v4.3.4 software. The e-module created contains a complete description of the material with supporting illustrations, there are practice questions to deepen the material, answer keys in each practice question, and quizzes that can be done to measure the level of understanding of the material. The appearance of the e-module is attractive, with colors that are not monotonous and equipped with music that can be played as needed. Learning media are made valid and can be accessed easily according to user needs.

The interactive e-module learning media assisted by the Kvisoft Flipbook Maker application on the material for the seventh-grade algebraic form of SMP/MTs was made and declared feasible to be used in the learning process independently or at school. The assessment results can be seen from the validation results and user responses. Based on the validation results from material and media experts,

the average score was 4.47, with an ideal percentage of 90.85%. The assessment results from educators obtained an average score of 16.9 from a maximum score of 18 with an ideal percentage of 87.5%. The assessment results from students obtained an average score of 15.2 from a maximum score of 16 with an ideal percentage of 92% in the excellent category so that the e-module is feasible to use.

The ever-evolving digital technologies and their ubiquity have created challenges for mathematics teachers to effectively integrate them into existing practice or use them to create new and innovative practices (Attard & Holmes, 2019). E-module assisted by the Kvisoft Flipbook Maker application can be an alternative learning resource used in classroom, online, or blended learning. Therefore, this module becomes more flexible because it can be used anytime and anywhere to support the learning process. This is also a challenge for teachers to provide innovative learning and technological developments because e-modules designed for learning must be rich in activities accompanied by clear instructions so that students can learn independently. Teachers need to formulate clear and precise instructions in using the application so that its use can meet learning objectives (Larkin, 2016).

Brahier, (2020) argues that technology can be combined for a number of different purposes in the learning process, including (a) to teach, (b) to explore, and (c) to evaluate student progress. The excellence of the e-module assisted by the Kvisoft Flipbook Maker application is the presentation of material in stages, equipped with supporting illustrations, practice questions/quizzes; and students learn from physical books and can also learn with e-modules online and are more practical for learning. Oftentimes, graphs, diagrams, or visual images involving mathematical principles can be used to motivate students (Brahier, 2020). The e-module learning media assisted by the Kvisoft Flipbook Maker application can be used as a medium for self-study or at school. Through this flipbook, knowledge of algebraic subjects can be obtained maximally, can also increase students' creative thinking skills (Setiyani et al., 2022). Because there are illustrated images and sounds that can be adjusted according to need, there is an online quiz to measure the ability to understand the material to attract students' attention to learn algebraic material through e-modules with Kvisoft Flipbook Maker.

CONCLUSIONS AND SUGGESTIONS

An E-module learning media has been successfully created with the Kvisoft Flipbook Maker application on algebraic material for class VII SMP/MTs. The material of algebraic forms discussed in the e-module is the understanding and elements of algebraic forms, operations on algebraic forms, powers, factoring, and solving contextual problems in everyday life with algebraic form operations.

This e-module is suitable for the mathematics learning process because it has passed the feasibility test through product validation by material and media experts and trials by teachers and class VII

students of SMP Negeri 3 Bantul. The validation results show that the e-module learning media assisted by the Kvisoft Flipbook Maker application is feasible, with an average score of 4.47 and an ideal percentage of 90.85%. The feasibility of e-module learning media assisted by the Kvisoft Flipbook Maker application is supported by the results of field trials in the excellent category, with an educator's mean score of 4.22 and an ideal percentage of 87.5% and a score of 15.2 from a maximum score of 16 with an ideal percentage of 92%. for all aspects, so that the product is feasible to be used in the mathematics learning process.

REFERENCES

- Attard, C., & Holmes, K. (2019). Technology-enabled mathematics education: Optimising student engagement. Routledge. <https://doi.org/10.4324/9781351189392>
- Bergmann, J., & Sams, A. (2014). Flipped learning: Gateway to student engagement. International Society for Technology in Education.
- Bicer, A., Marquez, A., Colindres, K. V. M., Schanke, A. A., Castellon, L. B., Audette, L. M., Perihan, C., & Lee, Y. (2021). Investigating creativity-directed tasks in middle school mathematics curricula. *Thinking Skills and Creativity*, 40, 100823. <https://doi.org/10.1016/j.tsc.2021.100823>
- Brahier, D. J. (2020). Teaching secondary and middle school mathematics. Routledge.
- Hamid, M. A., Yuliawati, L., & Aribowo, D. (2020). Feasibility of Electromechanical Basic Work E-Module as a New Learning Media for Vocational Students. *Journal of Education and Learning (EduLearn)*, 14(2), 199–211. <https://doi.org/10.11591/edulearn.v14i2.15923>
- Handayani, D., Elvinawati, E., Isnaeni, I., & Alperi, M. (2021). Development Of Guided Discovery Based Electronic Module For Chemical Lessons In Redox Reaction Materials. *Int. J. Interact. Mob. Technol.*, 15(7), 94–106. <https://doi.org/10.3991/ijim.v15i07.21559>
- Istiqomah, I., Kuncoro, K. S., Oktaviani, D. N., & Sujadi, A. A. (2018). Developing Number Theory Textbook to Improve Understanding of the Prospective Teachers' Concept. *Proceedings of the 1st International Conference on Science and Technology for an Internet of Things*. <https://doi.org/10.4108/eai.19-10-2018.2282536>
- Jugembayeva, B., & Murzagaliyeva, A. (2021). Creative thinking as a driver for students' transition to university 4.0 model. *Thinking Skills and Creativity*, 41, 100919. <https://doi.org/10.1016/j.tsc.2021.100919>
- Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of E-Learning*, 15(2), pp107-115. <https://academic-publishing.org/index.php/ejel/article/view/1824>

- Kuncoro, K. S., & Arigiyati, T. A. (2020). Development of 3N-Oriented TPACK Mathematical Computing E-Modules. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, 8(2), 122–130. <https://doi.org/10.25273/jipm.v8i2.5833>
- Larkin, K. (2016). Geometry and iPads in primary schools: Does their usefulness extend beyond tracing an oblong? In *International perspectives on teaching and learning mathematics with virtual manipulatives* (pp. 247–274). Springer. https://doi.org/10.1007/978-3-319-32718-1_11
- Mpungose, C. B. (2020). Student teachers' knowledge in the era of the fourth industrial revolution. *Education and Information Technologies*, 25(6), 5149–5165. <https://doi.org/10.1007/s10639-020-10212-5>
- Murdianto, P., Aunurrahman, A., & Astuti, I. (2021). Development of Descriptive Text Learning E-Module with a Constructivistic Approach. *Journal of Education, Teaching and Learning*, 6(2), 154–162. <https://doi.org/10.26737/jetl.v6i2.2619>
- Prinstin, E., & Handayati, P. (2018). The Development of Contextual based Accounting E-Module to Improve Students' Learning Motivation. *Proceedings on the 2nd International Research Conference on Economics and Business, Irceb*, 20–26. <https://doi.org/10.5220/0008784400200026>
- Rochsun, R., & Agustin, R. D. (2020). The Development of E-Module Mathematics Based on Contextual Problems. *European Journal of Education Studies*, 7(10). <https://doi.org/10.46827/ejes.v7i10.3317>
- Scherer, R., Tondeur, J., Siddiq, F., & Baran, E. (2018). The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: Comparing structural equation modeling approaches. *Computers in Human Behavior*, 80, 67–80. <https://doi.org/10.1016/j.chb.2017.11.003>
- Setiyani, Waluya, S. B., Sukestiyarno, Y. L., & Cahyono, A. N. (2022). E-Module Design Using Kvisoft Flipbook Application Based on Mathematics Creative Thinking Ability for Junior High Schools. *International Journal of Interactive Mobile Technologies (IJIM)*, 16(04 SE-Papers), 116–136. <https://doi.org/10.3991/ijim.v16i04.25329>
- Shih, W.-L., & Tsai, C.-Y. (2017). Students' perception of a flipped classroom approach to facilitating online project-based learning in marketing research courses. *Australasian Journal of Educational Technology*, 33(5). <https://doi.org/10.14742/ajet.2884>
- Siagan, M. V, Saragih, S., & Sinaga, B. (2019). Development of Learning Materials Oriented on Problem-Based Learning Model to Improve Students' Mathematical Problem Solving Ability and Metacognition Ability. *International Electronic Journal of Mathematics Education*, 14(2), 331–340. <https://doi.org/10.29333/iejme/5717>
- Sugiyono. (2015). *Metode Penelitian Kualitatif dan RND*. alfabeta.

- Thiagarajan, S., Semmel, D. S., & Semmel, M. I. (1974). *Instructional development for training teachers of exceptional children*. Minneapolis, Minnesota: Leadership Training Institute/Special Education.
- Widyawati, A., Setyawan, D. N., & Kuncoro, K. S. (2019). Desain e-book petunjuk praktikum IPA berbasis tri N (niteni, nirokke, nambahi). *COMPTON: Jurnal Ilmiah Pendidikan Fisika*, 6(2), 46–56. <https://doi.org/10.30738/cjipf.v6i2.6096>
- Wilkinson, L. C. (2018). Teaching the language of mathematics: What the research tells us teachers need to know and do. *The Journal of Mathematical Behavior*, 51, 167–174. <https://doi.org/10.1016/j.jmathb.2018.05.001>
- Xu, T., & Zhang, B. (2021). Improving thinking skills in early childhood using effective teaching strategies. *Aggression and Violent Behavior*, 101704. <https://doi.org/10.1016/j.avb.2021.101704>
- Yang, C.-L., Yang, Y.-C., Chou, T.-A., Wei, H.-Y., Chen, C.-Y., & Kuo, C.-H. (2020). Case study: Taiwanese government policy, STEM education, and industrial revolution 4.0. In *STEM in the Technopolis: The power of STEM education in regional technology policy* (pp. 149–170). Springer. https://doi.org/10.1007/978-3-030-39851-4_9