Analysis of Electronic Teaching Materials Validity from Research Result Product of Student's Thesis Development at Mathematics Education Department of State Islamic University Sultan Syarif Kasim Riau

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Abstract. The purpose of this research is to find out how the validity of electronic teaching materials from a result of research thesis product development at Riau Mathematics Education students. The subject of the research is the students who had the results of development research in the form of electronic teaching materials in 2021 and 2022. The type of this research is qualitative research, with descriptive methods. The design of the research is a case study, with data collection techniques, namely documentation and interviews. The results of data analysis not only to show that students who develop electronic teaching materials need a lot of time to be proficient in producing electronic teaching materials, but also the students who are greatly facilitated by Youtube videos in order to learn how to make electronic teaching materials such as e-modules using Flip PDF Professional and e-LKS by using liveworksheets. From a technical point of view in the electronic field, students have the potential to produce electronic teaching materials that are very useful for learning mathematics in recent day. It is in line with the demands that an educator must be able to keep up with technological developments so that the learning process runs as needed. However, when it is viewed from the composition of the material and learning activities, it has not shown an important message from the concept of the mathematical material itself, and the resulting arrangement tends to only use formulas as a starting pointb to place the concepts to the students by using practice questions, students are rarely directed based on their experience and basic knowledge, as a result the learning process tends to be not meaningful for students. Based on the results of the general analysis, it is necessary to hold a material validation team that is totally facilitated so that the results of the validity test of student development products are truly tested and ready to use, then in the future the results of research products for developing student thesis for Mathematics Education at UIN Suska Riau are suitable for its sustainable use and it is ready to be marketed.

Keywords: Electronic Teaching Materials; Thesis Produc.

INTRODUCTION

Teaching materials are an important requirement in learning. The importance of teaching materials is felt by students. Now days, students are used to explore their own teaching materials for their learning needs. This phenomenon has become very visible in its need since the introduction of online learning. Without realizing it, so many students look for teaching materials that ultimately do not match their needs, because the existing teaching materials have not been presented according to the components contained in the applicable circular. For example, for the supporting information component, it shows that many teaching materials do not provide supporting information for their readers.

In accordance with the circular contents of book 4 concerning the scientific publication of goverment regulations No. 16 of 2009 shows that an educator must be able to present materials that are in accordance with the teaching materials he has chosen, for example teaching materials in the form of modules. Modules generally cointant of; 1) student instructions, 2) content of the discussion material (descriptions and examples), 3) student worksheets, 4) evaluation, 5) evaluation answer keys, and 6) tutor/teacher handbook (if any). This means that each component must exist in the module according to its contents. The content presented in each component really does not run away from the learning outcomes that have been determined. In connection with this, the researcher tried to analyze the teaching materials developed by students of Mathematics Education at UIN Suska Riau, namely electronic materials in the form of electronic modules and electronic LKS (Student Worksheets). The electronic LKS developed are using Live worksheets, LKS files through Google Classroom and WhatsApp media, while the electronic modules developed by students are using Flip PDF Professional.

The live worksheet here is used online worksheets. Online worksheets are worksheets that are developed and run using the help of a computer system, internet support and the selected material does not require difficult understanding and can be done independently, in this case it can be run with a blended learning system. Hobri states (2021) that the application of the Blended Learning model in student worksheets must pay attention to aspects of learning objectives, learning characteristics so that teaching and learning activities run effectively. To combine two lessons at once, namely; face-to-face learning and online learning by utilizing technology is called the Blended Learning model. There are two LKS used by the Blended Learning model, namely LKS for face-to-face learning and LKS for online learning. Siti Maesaroh (2019) in her article states the benefits of google classroom in learning shows that google classroom is a structured management for all student learning activities. Swita Amallia Hapsari and Heri Pamungkas (2019) explained that there are many benefits of google classroom, one of which is electronic worksheets that can be presented in google classroom. Mustakim Sagita and Khairun Nisa (2019) explained that the google classroom is a mixed

learning platform for the scope of education that can make it easier for teachers to create, share and classify each paperless assignment. Meanwhile, WhatsApp is usually used as a medium to gradually remind students about learning activitie

Electronic modules or commonly called e-modules (Kemendikbud, 2017) are teaching materials that are systematically designed based on a certain curriculum that can be used to achieve certain learning objectives that have been set by presenting them in an electronic format. Purwaningtyas (2017) revealed that e-module is an electronic teaching material that contains the characteristics of teaching materials that made in a unified whole, arranged systematically so that students can learn independently according to their abilities even without guidance from the teacher. Hirzan and Yuhendri (2020) define that the creation of e-modules is done through the first step of adjusting the basic competencies and syllabus based on the 2013 curriculum, then proceeds to the step of preparing the e-module design whose draft starts from Microsoft Word followed by using the e-module maker software, and the last step is e-module validation by validator. In connection with that, the module produced by students should be able to facilitate students' independent learning.

Student Worksheet (LKS) is a student guide that is used to carry out investigation or problem solving activities. The Ministry of National Education states that LKS are sheets that contain references for students to carry out programmed activities. This sheet contains the demands of questions, instructions and understanding so that students can deepen and broaden their understanding of the material being studied. Another opinion says that worksheets are printed media in the form of sheets containing material, material summaries, instructions for implementing learning activities that must be carried out by students whose contents refer to the basic competencies that must be achieved. So it can be concluded that electronic worksheets are electronic learning resources that can help students understand learning equipped with materials, summaries, work instructions and practice questions. Electronic LKS contains LKS for several activities, namely electronic LKS for before face to face, during face to face, and after face to face.

In connection with this, the electronic LKS compiled has several different files, so to ensure that the files compiled are interconnected, it is necessary to have a facilitated validation team to be directed and consistent. To ensure that it goes as it should, the researchers tried to analyze the electronic module teaching materials and electronic worksheets developed by students, whether they were in accordance with what they should be or vice versa, the researchers tried to conduct research with the title Analysis of the Validity of Electronic Teaching Materials Results of Development Research Products Thesis of Mathematics Education Students at UIN Suska Riau.

METHOD

The type of research used in this study is qualitative research, with descriptive methods, where qualitative research is a research based on the philosophy of postpositivism which is used to examine objects naturally, in which the researcher is the key instrument, the data collection technique is done by triangulation (a combination of), the data obtained also tend to be qualitative, the data analysis is qualitative, and the research results are more understanding and finding something. Qualitative research is research that is carried out naturally which is carried out in combination so that the results obtained are understanding and finding. The subjects in this study were the product of development research in the form of electronic modules and electronic worksheets produced by Mathematics Education students as many as 6 products. The data obtained include written data on the final thesis and product development results in the form of electronic modules and electronic worksheets, and also the data from interviews with students who make electronic modules / LKS as many as 6 titles (3 e-module titles and 3 e-LKS titles) or 6 students of UIN Suska Riau Mathematics Education who have taken the thesis exam.

The data analyzed is related to the validity of the module/LKS test for both material validity and technology validity. The analysis of the validity material expert means that the researcher analyzes the suitability of the results from the validation sheet of the mathematician with his product, while for the analysis of the validation of the technology expert, the researcher analyzes the suitability of the results of the validation sheet of the technology expert with his product. The data analysis technique used is analysis which is divided into three, namely: 1) Data reduction. Reducing data means summarizing, selecting, focusing, and removing from written notes in the field, 2) Data presentation. The next stage is data presentation, after data reduction. completed, the data is arranged systematically which makes it easier to understand, and 3) Conclusion Drawing and Verification of the final conclusions obtained in qualitative research are expected to be new findings.

RESULTS AND DISCUSSION

The findings from the data of 6 student thesis regarding the electronic validation of the module and electronic worksheets can be seen in Table 1.

Table 1. Results of Material and Technology Validity Test

e-modul material	e-modul technology	e-LKS material	e-LKS technology
90% (very valid)	93,33% (very valid)	84,65% (very valid)	81,90% (very valid)
83,6% (very valid)	85,94% (very valid)	85,45% (very valid)	82,13% (very valid)
92,3% (very valid)	83% (very valid)	90% (very valid)	81,33% (very valid)

Table 1 shows that the electronic module and student worksheet electronic products from student development research are in the very valid category, both in terms of material validity and technological validity. The results of the validity test show that it is very valid, which means that the product has been recognized quantitatively and qualitatively that the product developed by students can be used. For the e-module category, the conclusion of the research shows that the developed of e-module has met the technical, didactic, construction, and appropriate aspects of using Flip PDF Professional software and the aspect of conformity with the approach (if any) so that the developed e-module is feasible. used as teaching materials, as well as for the electronic category of LKS on average, it shows that the developed worksheets have met the aspects of content feasibility, presentation feasibility, language feasibility, graphic feasibility and conformity with the model used so that the developed student worksheets are suitable for use as teaching materials. .

The research findings related to the products produced when it viewed from a technology perspective, it is true that there is a maximum use of technology such as the presentation of material not only in the form of writing but has included videos/video links explaining material both in the module and LKS. The products produced by students are technically in accordance with the demands of current learning needs that lead to Blended Learning. Jasmine Loise Tasa (2020) shows that e-learning presents the latest learning such as blended learning, mobile learning, web-based learning, virtual learning, internet learning, networked learning and distance learning, where with these many learning models, mathematics learning can be achieved. presented to be more interesting and more effective so that it can meet the learning objectives. However, if further analysis of the product material results from each teaching material title shows that the products produced by students still contain errors, the following examples of each product can be seen in Figure 1 and Figure 2.
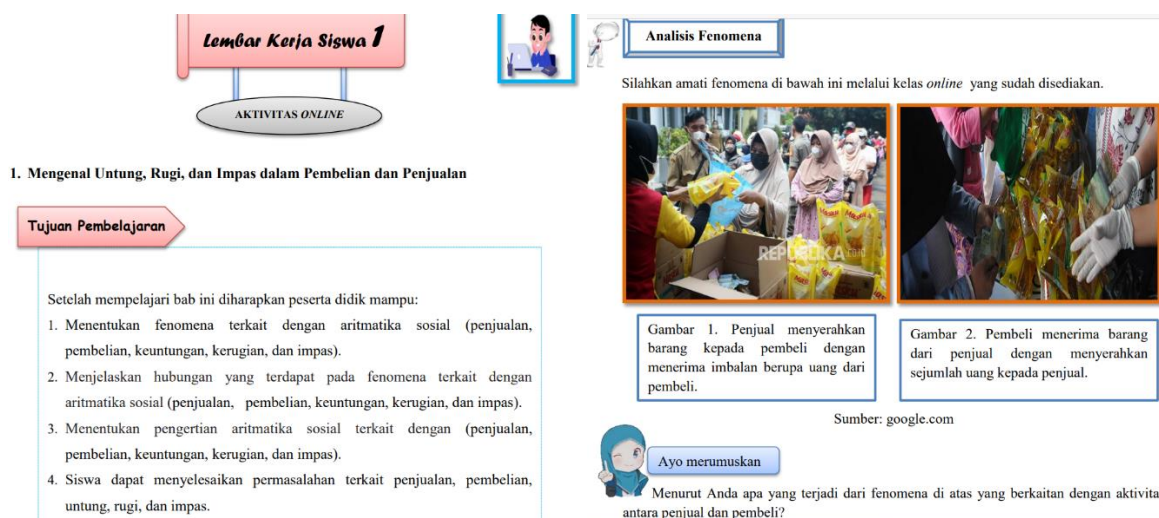

Figure 1. Examples of errors contained in the e-LKS

Figure 1 shows that the objectives made have not shown the feasibility of the content in the online LKS presented, the selected verbs have not directed students according to the learning activities that have been arranged, meaning that the preparation of the verbs is still not directed in accordance with applicable regulations. Judging from the efforts of teaching materials to present accurate material, it has not shown to encourage the curiosity of readers, so that teaching materials should need improvement to meet the feasibility of the content that has been determined previously.

Berikut ini nama-nama bentuk aljabar berdasarkan banyaknya suku.
➢ $5x$, disebut suku satu atau *monomial*.
➢ $4x + y$, disebut suku dua atau *binomial*.
➢ $3x + 2y + 4$, disebut suku tiga atau *trinomial*.
➢ Untuk bentuk aljabar yang tersusun lebih dari tiga suku disebut *polinomial*.

Dalam bentuk aljabar juga dikenal istilah **suku sejenis dan tidak sejenis,** berikut penjelasannya dan lengkapilah untuk menambah pemahamanmu!!!

TABEL 1.2
Suku sejenis dan tidak sejenis

No	Suku	Jenis Suku	Penjelasan
1.	$3x, 5x$ dan $-6x$	Sejenis	Karena memiliki variabel yang sama yaitu x
2.	$8y^3x$ dan $2yx^2$	Tidak sejenis	Karena meskipun variabelnya sama yaitu x dan y, tetapi pangkat variabelnya tidak sama

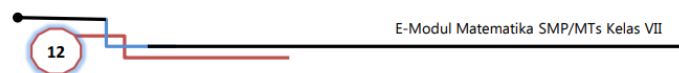12   E-Modul Matematika SMP/MTs Kelas VII

Figure 2. Example of errors contained in e-Modul

Figure 2 shows that the material presented tends to be in the form of rote information, or formulas that are the main focus, not yet directing students' mindsets to find concepts. The modules that are made present more provisions that have unclear causes and consequences so that it rarely shows teaching materials that have met the feasibility of presentation, both seen from the presentation of material that should be interactive and participatory, as well as viewed from the systematic presentation, so that teaching materials should need improvements to meet the eligibility requirements.

Based on the explanation of Figure 1 and Figure 2, the researchers found an invalidity between the contents of the teaching materials produced and the validation sheet produced, this indicates an error in validating in terms of content feasibility and presentation feasibility. The error in question is part of mastery of TPACK (Technological Pedagogical Content Knowledge), which describes how content (what is taught) and pedagogy (how teachers deliver that content) should form the basis for effective educational integration. The technology applied must communicate content

and support pedagogy to enhance the student learning experience. TPACK according to (Cox & Graham, 2009, pp. 60–29) is teacher knowledge about how to facilitate students in learning through pedagogic and technological approaches. TPACK in education is a framework for designing learning models by integrating three main aspects, namely technology, pedagogy and content (Hidayati, Setyosari, & Soepriyanto, 2018, p. 292). This is in line with the concept of education that is emphasized in the 21st century where teachers are required to be proficient in applying technology in learning.

CONCLUSION

Based on the results and discussion, it shows that the teaching materials produced by students have met the requirements from a technological point of view but seen from the message of the material contained in the teaching materials, they still do not meet the feasibility of the content and the feasibility of presentation. It can be concluded that technically the products developed have met the needs of current learning technology, but the content of the material presented shows that there is no presentation that is able to lead readers to change learning behavior and the formation of diverse math learning skills, so that learning mathematics with blended learning and TPACK guidelines has not met expectations, hence it is a need for further development to produce teaching materials that comply with blended learning and TPACK guidelines.

REFERENCES

Achmad Noor Fatirul, Djoko Adi Walujo. (2020). *Desain Blended Learning (Desain Pembelajaran Online Hasil Penelitian).* Surabaya: Scopindo Media Pustaka.

Agustin, Ririn Dwi dan Shandi Pratama. 2018. *E-Modul dengan Pendekatan Saintifik Menggunakan Flip PDF Profesional Pada Materi Persegi dan Persegi Panjang.* Prosiding Seminar Nasional IKIP BUDI UTOMO (E-ISSN: 2774-163X).

Cox, S., & Graham, C. R. (2009). Diagram TOACK in Practice: Using an Elaborated Model of the TPACK Framework to Analyze and Depict Teacher Knowledge. TechTrends, 5(5).

Hasbullah. (2015). Blended Learning, Trend Strategi Pembelajaran Matematika Masa depan. *Jurnal Formatif*, 65-100.

Hidayati, N., Setyosari, P., & Soepriyanto, Y. (2018). Kompetensi Technogical Pedagogical Content Knowledge (TPACK) Guru Soshum Setingkat SMA. JKTP, 1(4).

Hobri, dkk "Pengembangan LKS kelas 7 SMP Aritmatika Sosial dan Penggunaannya dalam pembelajaran *Blended Learning Tipe Flipped Classroom"* Jurnal Pendidikan Matematika No. 01 Vol. 11(2021).

Luthfil Hirzan dan Muldi Yuhendri, "Pengembangan E-Modul Mata Pelajaran Instalasi Penerangan Listrik untuk Pembelajaran Daring," Jurnal Pendidikan Teknik Elektro 1, no. 1 (2020), hlm. 145.

Sagita, Mustakim, dan Khairun Nisa. "Pemanfaatan E-Learning Bagi Para Pendidik di Era Digital 4.0." Jurnal Sosial Humaniora Sigli 2, no. 2 (15 Desember 2019): 35–41. https://doi.org/10.47647/jsh.v2i2.169.

Siti Maesaroh, "Penerapan Metode Cooperative Learning dengan Memanfaatkan Aplikasi Google Classroom sebagai Upaya Meningkatkan Nilai Karakter Kebaikan Siswa Menengah Pertama", KoPeN: Konferensi Pendidikan Nasional 1, no. 1 (14 Oktober 2019), hlm. 170-171.

Tasa, Jasmin Loise. "Pengembangan Lembar Kerja Siswa Melalui Model Blended Learning Berbasis Budaya Melayu Sambas Materi Aritmatika Sosial Kelas VII SMP." CARTESIUS : Jurnal Pendidikan Matematika 2, no. 2 (9 Januari 2020): 17–30. https://doi.org/10.1234/cartesius.v2i2.603.

Purwaningtyas, Wasis D. Dwiyogo, dan Imam Hariyadi, "Pengembangan Modul Elektronik Mata Pelajaran Pendidikan Jasmani, Olahraga dan Kesehatan Kelas XI Berbasis Online dengan Program Edmodo," Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan 2, no. 1 (2017), hlm. 127, https://doi.org/10.17977/jp.v2i1.8471.