Proceeding International Conference on Religion, Science and Education (2022) **1**, 25-29

Developing E-Learning Assisted by Padlet on Matrix Learning to Improve Student Learning Outcomes

Putri Anggraini Purba
Mathematical Education Department, Program's Master, State University of Medan,
Jl. Kenangan Baru, Kec. Percut Sei Tuan, Deli Serdang Regency, North Sumatra 20371.

Corresponding author
putrianggraini967@gmail.com

Abstract: This study aims to develop Padlet-based online learning media on valid, practical and effective matrix materials to improve student learning outcomes during the covid-19 pandemic at SMK Multi Karya Medan. This type of research is research and development with the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation). The analysis stage is student profile analysis, needs analysis, and constraints. The design stage is designing products and devices. The development stage is developing learning products and tools and conducting validation. The implementation stage is applying learning media. The evaluation stage is to test student learning outcomes after using the media. The validity of the Padlet-based online learning media was assessed by one media expert, one design expert and two content experts with an average score of 3.72 media experts ("very valid" category), design experts 3.88 ("very valid" category), and material expert 3.49 ("valid" category). The practicality of learning media is seen from the student response questionnaires and teacher response questionnaire scores, namely 3.68 and 3.81. The effectiveness of learning media is seen based on the percentage of students' learning completeness, which is 87.5% (28 students out of 32 students are in the "completed" category after participating in learning) with an average score of 83.14. Overall, we can conclude that the pallet-based online learning media developed is valid, practical.

Keywords: Learning Outcomes, matrix, media development, online learning media, padlet.

Introduction

The Covid-19 pandemic that has hit all countries in the world, including Indonesia, has had a tremendous impact on several sectors of life, one of which is education. In the field of education, the impact of this pandemic has forced teaching and learning activities to be stopped and carried out from the homes of their respective students. This was also emphasized by the Governor of North Sumatra, Edy Rahmayadi, who prohibited face-to-face teaching and learning activities (KBM) in schools during the Covid-19 pandemic. The prohibition is stated in Circular No. 218/GTCOVID19/VII/2020. In this circular, it is written that the teaching and learning process will continue to be carried out from home online (Detiknews, 2020). The demands of this change make learning activities change significantly, one of which is the learning process.

During the pandemic, teachers are required to be more creative in delivering lessons. Therefore, learning media plays an important role in the teaching and learning process. The use of learning media is a very important requirement, during a pandemic learning is carried out virtually without direct face to face. The use of learning media is expected to help achieve student learning success and the learning process is more varied. Teachers as a component of education must be able to facilitate students to continue learning, deliver material and even an assessment system.

In the era of ICT (Information and Communication Technology) there are many software that can be used for education, including school mathematics education. The rapid development of technology opens up new

ISSN 2829-3355 | EISSN 2828-8467

opportunities and avenues in developing many things, including to develop the world of education. Currently, various kinds of technology have been developed that can be used to develop the world of education, including to support mathematics learning, namely as a medium for learning mathematics.

Mathematics is a science that has a deductive mindset and studies abstract structures and patterns of relationships that exist in them (Widiani, et al. 2019:40). Mathematics is very important for every student to learn, this is because mathematics itself has an important role in life. Understanding mathematics does not mean just understanding about addition, subtraction, multiplication, or division. But also must understand the intended purpose of a given subject matter. Not a few who think that mathematics is a difficult learning. But apart from that, in essence mathematics will feel easy and fun if it is packaged with an interesting learning process and easy for students to respond to. Learning mathematics should be a meaningful activity by freely actualizing all the potential that students have. So that mathematics learning can be student-centered, teachers need to choose a learning approach that involves students actively during the learning process, so that learning objectives can be achieved.

To overcome the above problems, we need a media that is able to accommodate all forms of information provided by the teacher to students. Through the media, it is hoped that all forms of information such as a list of children's attendance, activities carried out, to the results of each student's work. Many mediaassessments carried out online include the use of applications, one of which is Padlet.

Padlet is a web 2.0 tool that enables interaction and collaboration as a learning medium. Padlets are like virtual walls in the classroom, because students and teachers can write anything in them(Fitriani, 2021). Learning media using Padlet has been done before by(Ma & Xi, 2021). From the results of their research, it is explained that students understand the material better, the class atmosphere is more active and makes learning more meaningful. The purpose of this development is to produce padlet-based online learning media on matrix material for class XI SMK students. By using padlet-based online learning media, it is hoped that it will help students understand the concept of the material, because the material presented in this padlet-based interactive multimedia is not in its final form, but students themselves must explore their knowledge to find the concept of a material so that the learning process will become more meaningful. for students and will improve student learning outcomes.

Materials and Methods

This research was carried out with a research and development approach. This type of research is a method used to produce a certain product and test the effectiveness of a particular product (Sugiyono, 2011). The development model used in this study follows the stages of the ADDIE development model which was adapted by Reiser and Mollenda in 1990. This development model consists of 5 stages, namely analysis, design, development, implementation, and evaluation.

This research was conducted in class XI Multimedia SMK Multi Karya Medan. The subjects of this study were students of class XI Multimedia 2 on matrix learning materials. Respondents in this study amounted to 32 students. The instruments used in this study, namely: (1) media expert validation questionnaire, (2) design expert validation questionnaire, (3) material content expert validation questionnaire, (4) student response questionnaire, and (5) teacher response questionnaire, and (6) a test of understanding student learning outcomes. The data analysis technique used in this research is qualitative and descriptive quantitative data analysis techniques, which are used to determine the validity, practicality, and effectiveness of the developed learning media.

Results and Discussion

Analysis Step

The Analysis stage includes 5 things, namely: 1) front-end analysis, 2) learner analysis, 3) task

analysis, 4) concept analysis, and 5) specifying instructional objectives.

- The initial analysis consists of two analyzes, namely an analysis of teacher needs and an analysis of student needs which can be concluded that both teachers and students need "Development of Padlet-Based Online Learning Media on Class XI Matrix learning materials".
- Student analysis consists of two analyzes, namely analysis of student characteristics and analysis of student motivation. In the analysis of student characteristics, an analysis of students' understanding of the circle material for class XI was carried out.
- Task analysis was carried out to explain aspects of knowledge based on KI and KD adapted to the 2013 Revised 2018 Curriculum.
- Concept analysis is carried out by describing indicators of competency achievement in accordance with the selected KD, and compiling the concept of material that will be included in interactive multimedia products.
- The results of the concept analysis of the circle material will be presented in a concept map. After that, the elaboration of learning objectives or specifications of learning objectives is carried out.

Design Step

At the design stage there are four stages, namely: 1) format selection and preparation of teaching materials and media, 2) interactive multimedia programming, 3) compiling research instruments, and 4) padlet-based interactive multimedia display with a contextual approach. The results of this stage can be seen in the following figure.

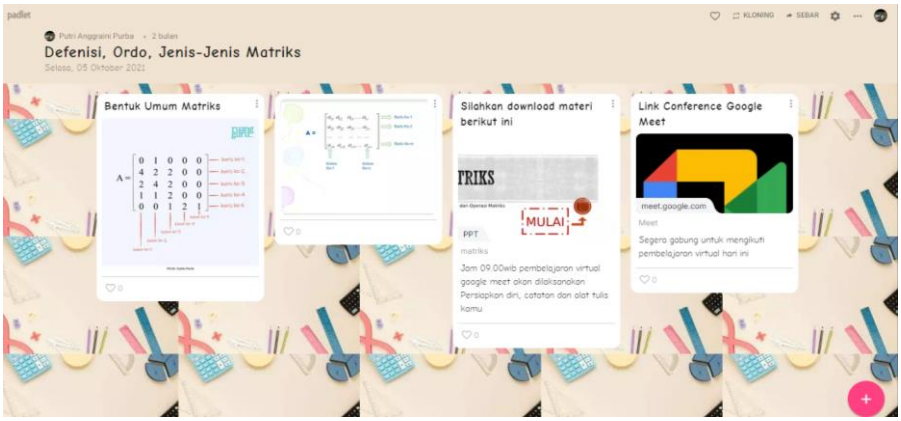

Figure 1. Home Page.

Figure 2. Material Display.

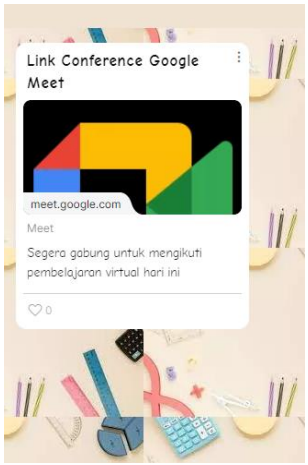

Figure 3. Display of Conferences.

Figure 4. Display of Questions.

Development Step

In the Padlet learning media validation test, that consist of 4 validators that are 2 expert material, 1 expert design and 1 expert media. The following are the results of the product feasibility test of the expert validator and the results of the practicality test.

Table 1. Summary of Learning Media Validity Test Results (e-learning).

Media expert total score	3.72
Design expert total score	3.88
Criteria	Very Valid
Material Expert Total Score 1	3.62
Total Expert Score Material 2	3.36
Material Expert's Average Score	3.49
Criteria	Valid

Table 2. Summary Results Response Teacher and Student to Media Learning (e-learning).

Average Teacher Response Score	3.74
Average Student Response Score	3.68
Criteria	Very Valid

Table 3. Results Test Learn on material Matrix.

No	Variation	Score
1.	The highest score	97
2.	Lowest Value	58
3.	Average	83.14
4.	Many students have completed	28
5.	Many students have not finished	4
6.	Completeness presentation	87.5%

Implementation Step

At step implemented products widely for test the effectiveness of the product in learning activities. However, in this development research, the implementation stage was not carried outwidely due to time and cost constraints in development research process. Distribution is limited to 20 students as a small group trial and6mathematics teacher as a practitioner from the selected school.

Evaluation Step

The results of the evaluation are used to provide feedback on the development of padlet-based learning media. Then revisions are made according to the results of the evaluation or needs that have not been met by the purpose of developing a learning media.

Discussion

Development research is research that is used to produce a product and test its effectiveness (Hamzah, 2020:1). In this development, the developer produces interactive multimedia based on padlets with a contextual approach to class XI circle material. The preparation of this interactive multimedia uses the stages of the ADDIE development model developed by Reiser and Mollenda in 1990 which consists of 5 stages, there are: analysis, design, development, implementation, and evaluation.

Through the implementation of ICT in learning with padlets, the mathematics learning process is more student centered (student centered) so that learning outcomes increase (Rahman, et al., 2014). Moreover, in developing this media referring to a scientific approach, the resulting media is specifically designed to stimulate the thoughts, feelings, attention, and willingness of students so that the learning process occurs. In addition, this developed learning media contains information that can be in the form of knowledge or become a means for students to carry out learning activities such as: reading, observing, trying, doing questions, answering questions, and others (Sahid, 2010). This is emphasized that the function of using learning media is very important because it discusses the relationship between students and learning materials or learning systems (Septian, 2017). In other words, this padlet-based online learning media can be used as an appropriate learning resource in the context of activating learning resources which is one of the demands of learning in the era of the industrial revolution 4.0.

The effectiveness of the developed learning media is able to improve student learning outcomes. The results of this study are in line with the results of Fitriyah's research (2021), entitled "Development of Padlet-Based Interactive Multimedia with a Contextual Approach to Circle Material for High School Students in Class XI", which both developed learning media with padlet as a medium of exploration and effectively improve students' understanding of mathematical

concepts on the topic of circles. Furthermore, the results of this study are also able to answer the shortcomings of the results of the research conducted by the previous researcher Suryawan (2019), where the online presentation of this research provides flexibility for students to study anywhere and anytime while still following a scientific approach to the implementation of the 2013 Curriculum. The product in the form of learning media resulting from this research certainly has advantages and disadvantages. The advantages are: (1) learning media can help students to learn independently or help teachers in the learning process in the classroom; (2) this learning media is easily accessible via online; (3) there are exploratory media that can help students learn a concept; and (4) adapted to the 2013 Curriculum.

Based on the results of research and development using the ADDIE model, it was obtained from using e-learning media, that student learning outcomes have increased on the results of the pretest and posttest. Based on results test beginning (pretest), so obtained amount student which finished for material are 4 students (12.5%), 28 student completeness not yet reach KKM with average class 34.13. Problem the overcome with gift action with develop a media learning on line use padlet and obtained amount student which reach completeness study as much 28 people from 32 people, and level of completeness study student by classic 87.5% with average 83.14. Enhancement amount student which reach criteria completeness study as much 24 person from test beginning (pre-test), enhancement completeness classic as big as 75%, enhancement average as big as 49.01.

Conclusions

Based on results and discussion study, it can be concluded that online learning media (e-learning) based on padlet on matrix's lesson has full criteria valid, practical, effective and capable of increasing student's learning outcomes of SMK Multi Karya. Besides that, this e-learning can be used as interactive media learning for study mathematics in the industrial revolution 4.0 era.

References

Detiknews. 2020. *Gubsu Edy Teken Surat Edaran Baru, Larang KBM Tatap Muka di Sekolah*.

Fitriani, y. 2021. *Penggunaan Aplikasi Padlet Dalam Pembelajaran Menulis Teks Eksposisi*. *Dinamika: jurnal bahasa. Sastra, pembelajarannya*, *4*(1), 1–15. Https://jurnal.unsur.ac.id/dinamika/article/view/1047/1063

Hamzah, A. 2020. *Metode Penelitian dan Pengembangan (Research & Development) Uji Produk Kuantitatif dan Kualitatif Proses dan Hasil Dilengkapi Contoh Proposal Pengembangan Desain Uji Kualitatif dan Kuantitatif*. Malang: Literasi Nusantara Abadi

Ma, s. M. A., & xi, k. 2021. *Pengembangan Multimedia Interaktif Berbasis Padlet Dengan Pendekatan Kontekstual Pada Materi Lingkaran Untuk Siswa SMA/MA KELAS XI Fitriyah Agustiningrum 1, Sunismi 2, Gusti Firda Khairunnisa 3*. *16*(12), 48–56.

Rahman, S., Munawar, W., & Berman, E. T. 2014. *Pemanfaatan Media Pembelajaran Berbasis Website Pada Proses Pembelajaran Produktif Di SMK*. Journal of Mechanical Engineering Education, 1(1), 137. https://doi.org/10.17509/jmee.v1i1.3746

Sahid. 2010. *Pengembangan Media Pembelajaran Berbasis ICT*. Pendidikan Matematika FMIPA UNY, 1–16.

Septian, A. 2017. *Penerapan Geogebra untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis Mahasiswa Program Studi Pendidikan Matematika Universitas Suryakancana*. PRISMA, 6(2). https://doi.org/10.35194/jp.v6i2.212

Sugiyono. 2011. *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.

Widiani, dkk,. 2019. *Matematika Lingkungan*. Equation. Vol 2 (1): 40