Blended learning based on ebook integrated Youtube in learning mathematics

Fitriani¹,², S Fatimah², and T Herman²

¹Program Studi Pendidikan Matematika, Institut Agama Islam Negeri Langsa, Jl. Meurandeh, Kota Langsa, Aceh, Indonesia
²Departemen Pendidikan Matematika, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudi No. 229, Bandung 40154, Indonesia

*fitriani@iainlangsa.ac.id; fitrianiummialif@upi.edu

Abstract. This study aims to develop an blended learning based on E-book integrated Youtube in mathematics learning geometry material that is valid, practical and effective and to determine students' readiness for the use of blended learning at the E-learning stage in mathematics learning. This research is a development research design development model used is the Analyze, Design, Development, Implementation and Evaluation model. And to see the readiness of students towards the use of Blended Learning at the E-learning stage the researchers used a type of qualitative research using descriptive research methods. This research was conducted for high school students in Negeri 1 Langsa City. The instruments used in this study were (1) Plans for implementing learning and E-books integrated with Youtube; (2) expert validation sheets, (3) teacher and student observation sheets; (4) tests; and (5) questionnaire. The results of the research show that developing a blended learning based on E-book integrated Youtube in mathematics learning geometry materia meets valid, practical and effective criteria. The results of the students' readiness questionnaire towards the use of blended learning in the E-learning stage in mathematics learning showed results on an average indicator with a value of 72.69% with a good category.

1. Introduction
The digital age of the 21st century in the face of industry revolusion 4.0 demands that teachers and students follow the development of the times, namely learning by using technology. This makes educators and students able to do the teaching and learning process not only in person but done online. Teaching is carried out in the world of education, because this technology has emerged a long time ago and little by little this technology is developing rapidly.

At the end of 2019 the world was shocked by the arrival of the Corona virus or called COVID 19. The virus appeared late in 2019 precisely first appeared in Wuhan and began to enter Indonesia in early 2020. So precisely on March 16, 2020 all activities intended for education such as elementary school, junior school, high school and university learning process is transferred online. With the existence of a decree from the Ministry of Education and Culture (Kemendikbud) which issued two circular related to the prevention and handling of the virus. The first, Circular Letter Number 2 Year 2020 concerning Prevention and Handling of COVID-19 within the Ministry of Education and Culture and Circular Letter Number 3 Year 2020 concerning Prevention of COVID-19 in Education Units. So all educational
institutions are obliged to transfer learning that has been done face-to-face, transferred online. Learning online, one of which can be done with blended learning.

Blended learning according to [1]–[7] is a learning that integrates traditional and electronic learning with the process of combining two teaching models namely in the face-to-face process and computer media. Blended learning makes students free to study the subject matter independently by utilizing material available online, students can communicate/ discuss with teachers or other students that do not have to be done while in class (face to face), learning activities carried out by students outside of face time advance can be managed and controlled well by the teacher, the teacher can add enrichment material through internet facilities, the teacher can ask students to read the material or take a test conducted before learning, the teacher can hold a quiz, give feedback, and utilize test results effectively, and students can share files with other students. This can be done one of them with youtube integrated ebook, where later the teacher prepares an ebook that will be connected to youtube and students can learn and obtain further information through youtube. The learning process seems to certainly require the development design of blended learning. So the purpose of this research is to develop an Ebook-based Blended Learning design that integrates YouTune in mathematics learning geometry material that is valid, practical and effective and knows the readiness of students towards the use of blended learning at the E-learning stage in mathematics learning.

2. Methods

The type of research used is development research which is usually referred to as Research and Development. Research and Development is a research method used to produce products and test the effectiveness of these products. The development design model used is the ADDIE model. ADDIE model is a teaching design model that consists of 5 stages in accordance with its name, namely: Analyze, Design Development, Implementation, and Evaluation. And to see the readiness of students towards the use of Blended Learning at the stage of using descriptive research methods. This research was conducted for senior high school Negeri 1 Langsa City students. The instruments used in this study were (1) Lesson plan and ebook integrated YouTune; (2) expert validation sheet; (3) teacher and student observation sheets; (4) tests; and (5) questionnaire. The data collected is in accordance with the ADDIE development model, namely (1) analysis, in this phase the data was obtained from interviews and documentation: (2) Design, in this phase the data was obtained from the results at the analysis stage. both from the documentation interviews and the ebook analysis sheet that has been checked. So the ebook developed is adapted to the data (3) Development, in this phase the data is obtained from the results of the validation using a validation sheet that is intended as a validator. This validation sheet is to find out whether the ebook is suitable for use without revision or not suitable for use. scale 1. 2. 3. 4. and 5 (4) Implementation, in this phase the data is obtained from the results of the questionnaire, observation and tests, (5) Evaluation, in this phase, the data is obtained from the results of the practicality and effectiveness assessment questionnaire at the implementation stage. The data obtained is then analyzed so that it can know the quality of the ebook being developed. This research uses descriptive data analysis using the ebook product development / development variables as well as the resulting ebook quality variables and student tests. The data obtained is then collected and analyzed.

3. Result and Discussion

The steps of preparing and developing blended learning based on youtube integrated ebook in learning mathematics geometry material are carried out with a development model that has been determined namely ADDIE with the following description: 1) Conducting an analysis which includes: a) Analysis of needs, analyze the need to establish the basic problems encountered in Geometry material, b) Analysis of student characteristics, analyze the condition of students in senior high school Negeri 1 Langsa based on the results of interviews with the teaching teacher. c) Analysis of material, analyzing Geometry material. 2) YouTube integrated ebook design: a) Ebook design adapted to learning, b) Lesson plan design tailored to the achievement competencies in the curriculum, c) Assessment instrument design ie researchers compile YouTube integrated ebook assessment instrument as a tool to measure
validity, practicality and the effectiveness of the resulting Ebook. 3) The development of an integrated YouTube ebook, the development of an Ebook that is measured from the instrument validity assessment of the Ebook by an expert validator. 4) Implementation of an integrated YouTube ebook in the learning process, ebooks are measured from the assessment of practicality and effectiveness instruments and filling students' answers to the questions contained in the developed Ebook. 5) Product evaluation, the product evaluation Ebook is revised based on the results of practicality and effectiveness measures obtained from the learning process.

The following are the results of the Ebook that has been developed and Ebook page the integrated youtube.

![Ebook cover](image1.jpg)

Figure 1. Ebook cover

![Ebook material page](image2.jpg)

Figure 2. Ebook material page
The picture above is some examples of Ebook pages that have been developed. The YouTube integrated ebook page can be viewed at this page https://online.flipbuilder.com/auol/dhsii/. After the youtube integrated ebook has been developed, the researchers then test the validity, practicality, effectiveness and see the readiness of students towards the use of blended learning. E-learning in mathematics during the pandemic COVID-19. The results of the analysis are as follows:

3.1 Validity
Evaluation of YouTube integrated ebook validity is measured based on the results of validation by looking at the quality of a product from its relevance, as well as considering the purpose of developing the product. Therefore, validity criteria can include the validity of the content or material, namely the suitability of the components underlying the creation of the Ebook and the validity of the construct or teaching material, namely the interrelation of all components in product development. Products in the form of an integrated YouTube ebook meet the valid categories based on the results of the assessment by expert validators. Each component in the Ebook fulfills valid criteria. Valid criteria obtained indicate that the Ebook is in accordance with theories. The assessment results were then analyzed and the Ebook validity score calculated by the experts was calculated. The average expert validator score is 4.13 with valid criteria. Ebooks are considered valid and validity is appropriate if the validity score
according to the expert validator reaches the minimum criteria is quite valid. Then it can be concluded that the YouTube integrated ebook produced is valid and suitable for use.

3.2 Practicality
The practicality assessment of YouTube integrated ebook is measured based on the teacher's and teacher's assessment results. The practicality of the developed ebook is determined from the opinion of the teaching teacher which states that the product produced can be used and the integrated YouTube Ebook is easy to use by the teacher and students in accordance with the intent of the developer. The practicality analysis of the integrated YouTube ebook is evaluated from the teacher's, teacher's and student's assessment of learning. Based on the results of the practicality analysis it was found that the average score of the teacher's assessment was 4.42 with the practical criteria of the student's assessment the average score was 4.37 with practical criteria and observations by observers with good criteria. Youtube integrated ebook is considered practical and if the practicality score is reviewed from the teacher teacher assessment and observers reach the minimum criteria quite practical Based on the practicality score that has been obtained then it can be concluded that the YouTube integrated ebook produced is practical and feasible to use.

3.3 Effectiveness
Assessment effectiveness of YouTube integrated ebook is measured based on the results of teacher teacher assessments and student tests. It can be concluded that the product developed is reviewed in terms of the consistency between design / goals with the experience and learning outcomes achieved by students. The results analysis of the teacher assessment obtained an average score is 4.07 with effective criteria, the average score of student assessment is 4.13 with effective criteria and student tests are 82.57 which shows the results of completeness according to minimal completeness criteria of the school. So it can be concluded that the integrated YouTube Ebook is effective and feasible to use.

3.4 Students' readiness for the use of blended learning in the E-learning stage in mathematics learning in the pandemic period COVID-19
The results of the students' readiness questionnaire on the use of blended learning in the E-learning stage in mathematics learning during the pandemic COVID-19 showed results on an average indicator with a value of 72.69% with a good category. From these results it shows that students who are in senior high school Negeri 1 Langsa have the readiness to use blended learning at a good E-learning stage. This overall result is the acquisition of each indicator of students' readiness for the use of blended learning in the E-learning stage. The statement of each indicator in the readiness to use blended learning at the E-learning stage on the indicators of the readiness of facilities and infrastructure shows 72.42% results, technology use skills with 72.31% results, the benefits of blended learning at the E-learning stage with 74.67% results and the obstacles faced by showing the readiness of students in both categories. This shows that students are ready for learning by E-learning.

4. Conclusion
Based on the results of the study it can be concluded that Blended Learning based on ebook integrated YouTube in mathematics learning geometry material has valid, practical and effective criteria. Likewise with the results of students' readiness shows the readiness of students with good categories. This shows that students are ready for learning by E-learning. The limitation in this research is that at the Blended Learning stage learning should be done face-to-face and online, but at this time it is only implemented at the E-learning stage. Another limitation of the youtube video used is that it doesn't have its own due to time constraints and this research is also a follow-up research part of the dissertation. For further research, it is necessary to look at how to apply Blended Learning in the face-to-face stage. Blended Learning learning is a learning process by combining learning face to face and online, and the video that was developed later was the YouTube video of the researcher. So the need for further research for the perfection of Blended learning learning.
5. References

[1] Bryan A, Volchenkova KN 2016 Blended learning: definition, models, implications for higher education 82.
[2] Angreanisita W, Mastur Z, Rochmad R 2019 Mathematical Literacy Seen from Learning Independency in Blended Learning with Project Based Learning Assisted by Moodle Unnes Journal of Mathematics Education Research 155-61.
[3] Helsa Y, Kenedi AK 2019 Edmodo-Based Blended Learning Media in Learning Mathematics. Journal Of Teaching And Learning In Elementary Education (JTLEE) 2 2 107-17.
[4] Kashefi H, Ismail Z, Yusof YM, Rahman RA 2012 Supporting students mathematical thinking in the learning of two-variable functions through blended learning Procedia-Social and Behavioral Sciences 46 3689-95.
[5] P Pertiwi A, Kariadinata R, Juariah J, Sugilar H, Ramdhani MA 2019 Edmodo-based blended learning on mathematical proving capability. InJournal of Physics: Conference Series 1157 4 042001.
[6] Supriadi N, Kusumah YS, Sabandar J, Afgani JD 2014 Developing High-Order Mathematical Thinking Competency on High School Students’ Through GeoGebra-Assisted Blended Learning Mathematical Theory and Modeling 4 6 57-66.
[7] Yaghmour KS 2016 Effectiveness of Blended Teaching Strategy on the Achievement of Third Grade Students in Mathematics Journal of Education and Practice 7 5 65-73.

Acknowledgments

My gratitude to the Institute of Education Fund Management (LPDP) of the Indonesian Ministry of Education Technology and Higher Education (Kemenritek Dikti) of the Republic of Indonesia for providing support for the completion of this paper.