



## **Development of electronic module learning media based on Whatsapp application to improve learning outcomes of economics subjects in class X of SMA Negeri 3 Tondano**

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### **Abstract**

This study aims to create and develop learning media electronic module based on whatsapp application to improve learning outcomes of economic subjects in class X SMA Negeri 3 Tondano that can be used to support learning so that it helps teachers in delivering subject matter. Learning media are made to combine multimedia objects, namely text and images, in addition to also knowing the feasibility of this learning media. This research was conducted at SMA Negeri 3 Tondano Class X and is a research and development (Research and Development). The object of research is an electronic module learning media based on whatsapp application. The research phase includes: 1) Research and information collection, 2) Planning, 3) Develop preliminary form of product, 4) Preliminary field testing, 5) Main product revision, 6) Main field testing, 7) Operational product revision, 8) Operational field testing, 9) Final product revision. Data collection techniques used were observation, documents and FGD using questionnaires that were analyzed descriptively. The research subjects were students of class X IPA 8 of SMA Negeri 3 Tondano in the Academic Year 2018-2019. The results of this study are electronic learning media module based on whatsapp application, with a percentage of eligibility (1) Assessment of users of Class X Natural Sciences 8 by 85% with good categories, (2) Assessment of material experts by 89% with good categories (3) Assessment from media experts by 75% with a good category (4) Assessment from multimedia experts whatsapp application by 90% with a very good category (5) The final evaluation results in the class X trial IPA 8 obtained with an average value of 75.8 so that there is an increase an average value of 9.9 from the previous results averaging 65.9 using a scale value of 100. Media whatsapp application based electronic learning modules are very well used in the learning process. In addition, there is an increase in learning outcomes for students who use whatsapp application-based electronic learning media on the economic subjects of BUMN material.

**Keywords:** learning media, electronic modules, whatsapp applications

### **1. Introduction**

In recent years, biased ferrite material for microstrip antenna structures has attracted noticeable attention. Ferrite is one of the important magnetic materials which are used as in both The purpose of the implementation of education is to develop the quality of human resources that already exist in humans themselves through various efforts so that from this goal, the implementation of education is required to produce students who have the ability to compete in the future. The use of instructional media in the teaching and learning process can arouse and even increase the desires and interests of students, generate motivation and stimulation of learning activities, and bring psychological effects on students.

The demand for education makes education continue to grow in line with the development of science and technology. Education has a role to prepare human resources who are able to think critically, directed, and independently that starts from the teaching and learning process in schools. Based on observations made at SMA Negeri 3 Tondano, learning in schools in general teachers mostly use the lecture method and the Student Worksheet media in supporting the learning process that takes place in the classroom. This causes student learning outcomes have not reached the mastery value with an average value of 70 or achieved so far only reached an average of 65 which is still below the completeness of economic subjects. Of

course, for the teaching and learning process to run more interestingly, there must be a learning medium by utilizing teaching materials as a learning resource.

The emergence of social media in the last few decades has influenced the way they interact with others as well as processing the wealth of information around them. The adoption of social media has accompanied the increase in the use of mobile devices that support social media applications (Bannon 2012 in Sugiyono, 2017) <sup>[1]</sup>. At present in the 2013 curriculum the teacher is no longer the only source of information. The process of delivering subject matter in schools is generally assisted with a print module, with the development of technology, the print module can now be changed to an electronic module, which can be used via smart phones and made even easier with whatsapp applications, where each student can access it via an android mobile phone.

The whatsapp application-based electronic module is an effort to provide students with easy learning to improve the quality of learning and learning outcomes so as to create more interesting and innovative learning in the classroom and outside the classroom. The electronic module contains components, namely the module/title cover, module usage instructions, concept maps, table of contents, introduction, learning materials about BUMN, question exercises, evaluations, answer keys, assessment scores and bibliography. Based on the description above, the researcher

is interested in conducting a media development research entitled “Development of Electronic Module Learning Media Based on Whatsapp Application to Improve Learning Outcomes of Economics Subjects in Class X of SMA Negeri 3 Tondano”.

## 2. Research Methods

### Formulation of the problem

Based on the problem identification and problem limitation set by the researchers above, the problem in this study was formulated as follows: “How to develop an electronic learning module based on whatsapp application to improve learning outcomes in economic subjects on business entities in the Indonesian economy, especially BUMN in students class X SMA Negeri 3 Tondano?”

### Research purposes

Based on the above problem formulation, the purpose of this study is to develop an electronic module learning media based on whatsapp application to improve learning outcomes in economic subjects in state-owned BUMN students in class X SMA Negeri 3 Tondano.

### Development Assumptions

The assumptions of the development of an electronic module learning media based on whatsapp application are as follows:

1. The electronic module learning media based on whatsapp application compiled is an electronic module that can be used independently or in groups.
2. Development material is based on Core Competencies (KI) and Basic Competencies (KD), class X students of SMA Negeri 3 Tondano.
3. The validator has the same view regarding the criteria for learning media for electronic modules based on whatsapp application. The validators in this study were material experts, electronic module learning media experts, and whatsapp application experts.

### Learning Media

The word media comes from the Latin *medius* which literally means middle, intermediary or introduction. More specifically, the notion of media in the teaching and learning process tends to be interpreted as graphic, photographic, or electronic tools for capturing, processing, and rearranging visual or verbal information<sup>[2]</sup>.

Learning media are defined as anything that can be used to channel messages / messages, stimulate the thoughts, feelings, concerns, and wishes of students so that they can encourage the learning process<sup>[3]</sup>.

While Arsyad (2013) said that learning media is anything that can be used to convey messages or information in the teaching and learning process so that it can stimulate students' attention and interest in learning<sup>[4]</sup>.

### Electronic Module

Modules are one type of learning media in printed form. The module contains a summary of the material that will be taught to students so that students can more easily understand the material being studied.

The following are some of the characteristics of electronic modules adapted from printed modules<sup>[5]</sup>

- a. Self-study, modules are arranged so that learners can understand them without or as little as possible help from others.
- b. Whole, it means that all learning material from one competency unit or sub-competency learned is contained in one module as a whole.
- c. Stand alone, meaning that the module developed does not depend on other media or must be used together with other media.
- d. It can be adjusted, meaning that the module can adjust to the development of science and technology in a certain period of time.
- e. Familiar with the user, meaning that the module should be easy to use, easy to operate, the instructions delivered are easy to understand and easy to respond to by students.

### Whatsapp Application

From a variety of sophisticated application features, the whatsapp application is one of the tools to communicate used by all groups, including students who cannot be separated from the need to communicate. Whatsapp is an online chat application that suits several types of mobile phones, including iphone, android, blackberry, and other mobile brands.

Whatsapp is a messaging application for smartphones. Whatsapp is a cross-platform messaging application that allows us to exchange messages without SMS fees, because WhatsApp uses the same internet data package for email, web browsing, and others. WhatsApp application uses an internet connection of 3G, 4G or wifi for data communication. By using WhatsApp, we can chat online, share documents, exchange photos.

### Some benefits of using WhatsApp

1. Not only text, whatsapp has the feature to send images, videos, sounds and locations via GPS hardware.
2. Integrated into the system: whatsapp, like sms, no need to open the application to receive a message. Notification of incoming messages when the mobile phone is not active will still be delivered if the mobile phone has been activated.
3. Message status: Red hour for loading process on our cellphone, check mark if message is sent to the network, double check mark if message has been sent to chat friends and red cross if message fails
4. Broadcasts and group chat: Broadcast to send messages to many users. Group chat to send messages to fellow members of the community. This application also allows us to delete or retract messages that have been sent.

### Method

This research is a type of research and development or Research and Development (R&D). Borg & Gall (1983) developed 10 stages in developing the model, namely<sup>[6]</sup>:

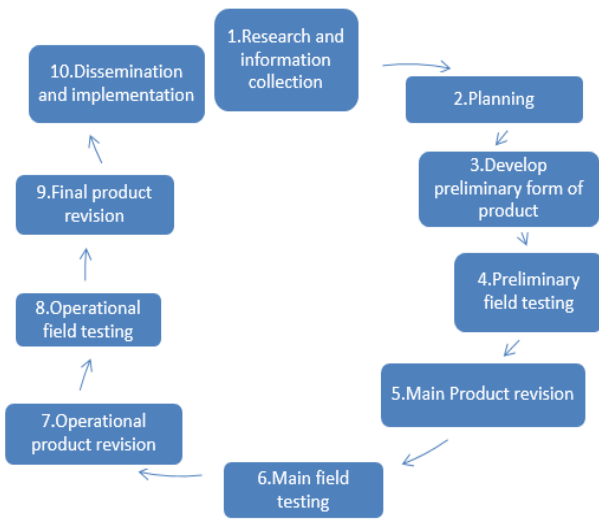


Fig 1

**Framework**

This study aims to produce a product in the form of an electronic module learning media based on whatsapp application for basic competencies. Describe the concept of business entities in the Indonesian economy. Based on expert opinion and theoretical studies about the development model of whatsapp application-based electronic modules, the basis for using this whatsapp application is because whatsapp is a messaging application for smartphones with basic similar to blackberry.

Whatsapp is a cross platform messaging application that allows us to exchange messages without SMS fees, because WhatsApp uses the same internet data package for email, browsing. The whatsapp application uses an internet connection of 3G, 4G, or wifi for data communication. By using WhatsApp, we can chat online, share documents, exchange photos and others.

**Research Subjects and Objects**

The test subjects at this stage were students of SMA Negeri 3 Tondano class X IPA 8 in 2018/2019 academic year who received economics and totaled 31 people. In this study the object under study was the feasibility of an electronic module based on whatsapp application as a source and medium for learning BUMN materials for class X in SMA Negeri 3 Tondano.

**Data Collection Technique**

In qualitative research, data collection is done in natural settings (natural conditions), primary data sources and more data collection techniques on observation (interviews), interviews, documentation and FGD (Focus Group Discussion).

1. Observation: At this stage the researcher makes observations and records of the phenomena that appear on the object of research. The observation technique used is to directly observe the planning, implementation and constraints found as well as what efforts are being made to overcome the obstacles in the implementation of the development of electronic learning media module based on whatsapp application.
2. Documents: Sugiyono (2012: 240) expressed his opinion about the document, the document is a record of events that have passed. Documents can be in the

form of writings, drawings or monumental works of a person. And at this stage the researcher tries to obtain information derived from written documents related to the research problem and important notes both from the school, individual teachers and students to complete the documented observational data.

3. Focus Group Discussion (FGD): Focus Group Discussion (FGD) is basically an interview conducted in a group. The purpose of Focus Group Discussion is to hold dialogues together, face to face with fellow respondents or research subjects in order to produce information directly from various points of view (Hardiansyah, in Umbase Ruth, 2012: 118) [8].

**There are at least three conditions in conducting a Focus Group Discussion (FGD), namely**

1. The number of participants ranges from 5-10 people.
2. Focus Group Discussion (FGD) participants must be homogeneous, in the sense of having the same or almost the same characteristics, namely those working in the same field.
3. The need for group dynamics in which researchers can direct the course of discussion, the division of turns in speaking or expressing opinions, responding to questions and agreeing on the answers given.

The discussion will be led by the researcher himself who will record the course of the discussion, and discussion material will be recorded in a complete transcript, including participants' comments to other participants and specific events during the discussion.

The implementation of FGD (Focus Group Discussion) in this study was carried out on eight informants from grade X students of SMA Negeri 3 Tondano. The implementation time is on Thursday, May 2, 2019 in class X IPA 8 of SMA Negeri 3 Tondano, from 10.00 to 11.05 WITA.

Data collected in this study include qualitative and quantitative data, namely:

- a. Qualitative data is data about the process of developing whatsapp application-based electronic learning media modules in the form of criticisms and suggestions from material experts, media experts, whatsapp application experts and student responses.
- b. Quantitative data is the main data in research in the form of a feasibility assessment of whatsapp application-based electronic learning media from experts, student response data on electronic modules that have been developed and student learning outcomes.

The instrument used to collect data was a questionnaire. The questionnaire was used to collect data on the results of reviews from material experts, media experts and whatsapp application experts and student responses. Questionnaire eligibility for learning media uses a Likert scale. Likert scale is used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena [9].

**3. Results and Discussion Learning Media Development**

**1. Collecting Research and information.**

At this stage, researchers conduct preliminary studies or exploratory studies whose purpose is to study, investigate,

and gather information. This stage includes: needs analysis, literature review, initial observation in class, identification of problems, and also collecting data about supporting factors and inhibiting learning. These observations were conducted in August to October 2018. Observations were made in class X IPA 8.

The first step in research and development is problem identification. The problem encountered in SMA Negeri 3 Tondano is the lack of student motivation due to the lack of interest in the Worksheet (Student Worksheet) used in the learning process and is dominated by teachers with lecture methods and the lack of use of facilities such as LCD projectors when learning in class.

The next step is to conduct curriculum and material analysis, from core competencies, basic competencies that are describing the concept of business entities in the Indonesian economy. Basic Competency (KD) is then broken down into three indicators, namely:

Explain the understanding and characteristics of BUMN, state the objectives of establishing SOEs, and state the forms of BUMN. From these observations and analyzes it is necessary to develop learning media to support teaching and learning activities in order to facilitate and help achieve learning objectives. The suitable learning media used to overcome these problems is the electronic module learning media based on whatsapp application. The whatsapp application-based electronic learning media was developed to make the whatsapp application-based electronic module learning media more practical so that students do not need to carry a lot of books, but also to take advantage of the facilities available to students in the form of android mobile phones, this certainly makes it easier for students to study anytime and anywhere.

## **2. Planning**

At this stage the researcher makes a product development design plan. Information gathering aims to identify what needs are needed to overcome the problems that occur in SMA Negeri 3 Tondano BUMN material. Therefore, the development of whatsapp application-based electronic learning media is suitable to meet the needs of students applying economic theory to their real life because this module contains explanations and images, animations and brings them closer to the real world so students will be more interested and motivated to learn economics.

This planning phase includes the design of electronic module learning media design, material preparation, questions and answer keys, and drawing collection. Modules are made in Microsoft Word then proceed in the WhatsApp application.

## **3. Develop the Preliminary Form of Product**

The results of the problem identification provide an overview of the types of products needed in learning on the subject matter of BUMN. At this stage the planning is carried out by establishing basic competencies and subject matter and developing a product framework.

## **4. Preliminary Field Testing**

This stage is where the researcher conducts a limited trial of the initial product in the field by involving one class with research subjects between 5-10 people. Where researchers began using the whatsapp application in the learning process. In this step data collection and analysis is done by

interview and observation.

## **5. Main Product Revision**

Revise the first stage or improvement of the initial product by subject teachers and other subject teachers, namely improvements to electronic module products based on the results of limited trials.

## **6. Main Field Testing**

At this stage, product trials were carried out on a wider scale involving one class, estimates to involve subjects between 15-30.

## **7. Operational Product Revision**

Conducting the second stage of revision, improving the product based on the results of a wider trial, so that the product developed is already an operational design model that is ready to be validated.

The next electronic module learning media go through the validation stage. At the electronic module learning media stage was validated by one material expert, namely the lecturer in economics at the UNIMA graduate program, Prof. Dr. H. J. D. Tamboto, M.Si. and one media expert, a lecturer in economics in the UNIMA graduate program, Dr. Edwin Wantah, M.Pd. and one whatsapp application expert, UNIMA Engineering faculty lecturer, Dr. CH T. M Manoppo, MAP inputs and suggestions from material experts, media experts and multimedia experts on whatsapp applications will be used as a basis for revision so that electronic module learning media developed will be even better.

## **8. Operational Field Testing**

Namely the validation test step against the operational model that has been generated. Testing is done through a questionnaire, interview, and observation and analysis of the results. The purpose of this step is to determine whether a model developed is truly ready for use in class without having to be briefed or mentored by researchers/model developers.

## **9. Final Product Revision**

Revise the final product, based on advice and field trials. The app-based electronic module assessment of whatsapp is carried out by economic material experts and learning media experts or application experts. This assessment is carried out with a questionnaire containing indicators that assess the electronic module based on whatsapp application. The questionnaire column also provides responses, suggestions and criticisms for the electronic module. The final product that is produced is an electronic module learning media based on whatsapp application which is packaged in a learning Android Mobile for class X across economic interests that has been validated and is suitable for use as a learning medium.

## **Validation of Material Experts, Media Experts, and Whatsapp Application Experts**

### **1. Material expert**

Validation carried out by material experts is to gather suggestions and opinions from material experts to make revisions. The assessment of learning module electronic media based on whatsapp application by material experts can be seen in the following table.

**Table 1:** Recapitulation of the results of the assessment by material experts

No.	Indicator	Value	Percentage (%)
1.	Content eligibility aspects	42 from 48	87.5
2.	Aspect of presentation eligibility	32 from 36	88.8
3.	Aspects of language eligibility	32 from 36	88.8
4.	Contextual assessment aspects	33 from 36	91.6
Percentage of overall indicator		89%	
Qualification		Good	
Information		Revised as necessary	

**2. Media expert**

Validation carried out by media experts is by gathering suggestions and opinions from media experts to make

revisions. The assessment of electronic module learning media based on whatsapp application by media experts can be seen in the following table.

**Table 2:** Recapitulation of the results of the assessment by media experts

No.	Indicator	Value	Percentage (%)
1.	Aspects of the feasibility of graphics according to BSNP	6 from 8	75
	a. Module size		
	b. Module cover design	20 from 28	75
	c. Module content design	48 from 64	75
Percentage of overall indicator		75%	
Qualification		Good	
Information		Revised as necessary	

**3. Expert multimedia whatsapp application**

Validation is done by whatsapp application multimedia experts is by collecting suggestions and opinions from whatsapp application multimedia experts to make revisions. The assessment of electronic module learning media based on whatsapp application by multimedia experts whatsapp application can be seen in the following table.

**Table 3:** Recapitulation of the results of the assessment by the whatsapp multimedia application

No	Indicator	Value	Percentage (%)
1.	Display characteristics in media	40 from 44	90
2.	Functions and benefits	23 from 24	95
3.	Learning materials	31 from 36	86
Percentage of overall indicator		90%	
Qualification		Very Good	
Information		No need to revise	

**4. Students**

The assessment of the learning module electronic media based on the whatsapp application was also carried out by representatives of students of class X IPA 8 of SMA Negeri 3 Tondano, totaling 8 students using a questionnaire. Complete questionnaire answers can be seen in the appendix. Here is a recapitulation of answers from 8 students of class X IPA 8 of SMA Negeri 3 Tondano.

**Table 4:** Recapitulation of the results of the assessment of student responses

No	Indicator	Score	Category
1.	Ketertarikan	161 from 192	
2.	Materi	148 from 192	
3.	Bahasa	91 from 96	
Total		400	
Average		3.4	
Percentage		85%	Good

Based on the table above there are 3 aspects which are

assessed by students. The content aspect of interest with 6 indicators scored 161. The feasibility of learning media is included in good qualifications with a percentage gained 84%. The contents of the material with 6 indicators get a score of 148 so that it is included in good qualifications with a percentage obtained by 77%. Aspects of Language with 3 indicators get a score of 91 so that it is included in the qualification is very good with a percentage gained 95%. The feasibility of electronic module learning media based on whatsapp application is included in good qualifications with a percentage gained 85%.

**4. Conclusion**

Based on the findings and discussion of the overall results of research on whatsapp application-based electronic module learning media, it can be concluded as follows:

1. Development of learning media: Achievement of student competencies in economic subjects is not maximized is marked by student learning outcomes have not reached mastery scores with an average value of 70 or achieved so far only reached an average of 65 which is still below the mastery of economic subjects. After collecting data the next step is to develop an electronic module learning media based on whatsapp application in accordance with the characteristics and criteria of learning media. The preparation of electronic modules includes titles, basic competencies, learning objectives, learning materials, practice questions and evaluations.
2. The feasibility of electronic module learning media based on whatsapp application

The feasibility of electronic modules was obtained in either category with a percentage of subject matter experts 89%, media experts 75% and multimedia experts whatsapp applications with a percentage of 90%, so it can be concluded that the development of electronic learning media module based on whatsapp application is feasible to use for learning. The results of the final evaluation in the trial of

grade X IPA 8 obtained with an average value of 75.8 so that there is an increase in the average value of 9.9 from the previous results an average of 65.9. So it can be concluded that the electronic module learning media based on whatsapp application is feasible to use for learning.

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