Development of Media Kocerin (Smart Box Interactive) to Learning Mathematics in Junior High School

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Abstract

The student of Junior High School is a child who get into teenager, so that he can adapt to the learning model that accords for himself. One of the duties and responsibilities for teachers are always trying to improve the quality of education by having innovations in learning that using learning media, so the students are interested, one of which is kocerin media (interactive intelligent box) that can motivate students to more understand the problem in the application of the game and can make imagination and preparing stimulus creative thinking of children.

The purpose of this Research R & D model Borg and Gall is to develop media Kocerin for junior high school students. The results showed that the product has been validated by kocerin 2 validator matter experts and media with the average score of 90 and 89.33 means kocerin products worth for use in the learning process in junior high school, has been applied in SMPN 3 Semarang and MTsN 2 Semarang, then the response of the children were very enthusiastic with percentage more than 90% of children enthusiastic participating on learning with media kocerin in MTsN 2 Semarang, while the average score 84.5 better than a control class 80.5.

Keywords: Kocerin, Mathematics, Comparison, Yunior High School
INTRODUCTION

In teaching methodology there are two aspects that most stand out. Namely teaching methods and teaching media as a tool in teaching and learning (Arends,: 2012). The teaching method is required to incorporate ICT-based media in each of the learning process in the classroom based on the K13 curriculum. Media is one determinant of a child's success learning. On learning activities occur teaching and learning process, that is the process of transferring information from a source of information to specific recipients of information through the media. (Baharudin: 2008). With the interesting media and adjusted by the level thinking of children, it is expected that children more accepting information in learning in order to reach optimal learning objectives (Buchori: 2010). Teachers ought to develop their own media learning attractive, economical, effective, and easy to make. As a facilitator the teacher should be able to provide enjoyable facilities, so that it will be ease when teaching and learning going on (Chacón: 2013).

Based on analysis of observations preliminary study to the students in SMPN 3 Semarang and MTsN 2 Semarang Grade 7 as a sample with passed structured interview namely deliver some questions in written questionnaire form, they answered that 80% of their math teacher explaining the material just a simple media or using powerpoint course, not using the modern media such as macromedia flash, lectora, Prezi and others.

In fact, the field may be concluded that the students of SMP / MTs in two schools haven’t been interested in accordance with the level development of junior high school who are in the operational phase, therefore, need to be made interesting media and effectively used in learning, according to Mayer (2009) explains that a good media is media that is able to combine interesting text and images, it has a lot of interactive multimedia in Pustekkom the pack, but do not combine media and game according to the level of education. Therefore need to be introduced renewable media namely Kocerin or interactive smart box is a visual-based print media and computer-based that provides an explanation of the information comprehensively and quickly understood by students independently and equipped with educational games (Eskrootchi: 2010).

Results of Gagne’s (2008) research explains that the colaboration learning and using media-based text and images can improve the students' ability to understand the material that is implied the image. Then from Gurney’s (2007) research explains that there are five factors that affect the success of student learning one of them is using text and picture media in mathematics learning makes students more enthusiastic and the students can easily understand the material. Upheld Isjoni study (2008) which shows that the interactive media can improve the result of learning and student response.
METHOD

This research aims to develop learning media based on character education via media kocerin in MTs, according to these objectives, the type of research is educational research and development. This is according with the opinion of Samsudi (2009) and Johnson (2005) with 10 systematic steps explain that the main purpose of development research is to develop effective KOCERIN product that can be used in the school which connected with the character education by the students of SMP / MTs. The product is not limited for concrete objects, such as textbooks, questions, but including the products and procedures like model or learning strategies (Takaya : 2008). Via Koncerin media the students of MTs are expected to be able to understand what it is with good character education, not boring and fun.

Image 1. Model Development Cycle Borg and Gall Research

Whereas the subjects of research were the students of SMP and MTs in the Semarang city, represented by SMPN 3 Semarang and MTSN 2 Semarang with random cluster sampling model based on the results of the National Examination (Arikunto: 2002).
RESULT AND DISCUSSION

The result of development research has been adapted by the steps of R & D Borg and Gall’s research with 10 steps which are:

1. doing preliminary research and initial data collection for the review of the literature, classroom observation, identifying problems and make the problems shorter.

During the preliminary study which has been conducted by Milovanovic (2012) on the interactive multimedia development on mathematics junior high school at the University of PGRI Semarang indicating that the interactive multimedia can improve student learning outcomes, then doing the literature related about interactive multimedia by Mc Laughlin (2010) which explains by combining text and images can improve motivation and response to student learning, and the observation in the classroom either in SMPN 3 Semarang and MTsN 2 Semarang data showed that during this time mathematics teacher grade 7 haven’t been using interactive multimedia renewable by macromedia flash application and others. so need to be made media which adjusted the level thinking of junior high school students, it is because not all of the school have LCD facilities, speakers and others, so it needs innovative breakthroughs to solve the problem, one of them with KOCERIN media (interactive intelligent Box). This is in accordance Monchai (2013) which showed that so many kinds of media can improve students’ multiple intelligences.

2. Do the planning namely identification and skills definition, formulation of objectives, and expert testing or testing on a small scale, or expert judgment.

In the planning to identify and formulate the goals making this KOCERIN media that can make KOCERIN media especially material semester’s one grade VII math namely social comparison and arithmetic which are often happen misconceptions in the classroom. Then doing Forum Group Discussion to make the design of KOCERIN products which are similar to material comparison and social arithmetic that can essentially motivate students to take math in antusias. with the initial design as follows:
After the KOCERIN (Smart Box Interactive) design has completed and then validated by the material. The result of expert validation gained an average of 90 and 89.33. it means that the product is eligible to be tested in the field. Reinforced by Muijs (2008) which shows that effective learning must dissertation appropriate approach. In the picture below is the result of material and media expert validation about product KOCERIN (Smart Box Interactive):
Based on Figure 3 explains that product of KOCERIN already good for all three aspects especially freshness media aspects, this Kocerin media is very interesting to use because it is able to combine gaming and materials simultaneously, while aspects of the language a little input be related with examples of question and exercises which must be made contextual, so the students can easily understand the essence from comparison material and social arithmetic. This is according with the opinion of Ogochukwu (2010) which showed that schools in Nigeria are very enthusiastic with their interactive media.

**Figure 4.** The Result Media Specialist Validation Product of Kocerin Material

3. Development type or shape of the initial products include: preparation of learning materials, preparation of guide, and evaluation tools.

In developing products of Kocerin is created with using software Corel Draw, Macromedia Flash that packaged into attractively based games and practical use in learning with packaged inside CD Interactive, in this Kocerin Media contains SK, KD, Indicators, description of materials, example of questions, quiz, and instrumental music which is restricted comparison materials and arithmetic materials of social class VII Junior High School that use Curriculum 2013, so that is makes teacher and students interested to use them in the learning process. The result of the tests or quiz in each chapter can be determined directly along with his key to answer so the students know the answer is correct or incorrect. In each application completed the game with choose a preferred circle, then came the matter of the magic box interactively.
4. To do the initial test, carried out 6-12 subject. The collection of information / data by using observation, interviews, and questionnaires, and continued data analysis.

In the selection of subjects research have two schools, they are MTsN 2 Semarang and Junior High School 3 Semarang with each of three children, thus representing a national school and religious, from results of observations obtained high enthusiasm concerning using product of Kocerin to use in the process of learning mathematics, then based on the interview results with mathematics teacher and the students obtained input for adding instrumental music that is able to attract or stimulate students to study, the material must adapted with Curriculum 2013, then the results of initial questionnaire concerning the teachers and students in MTsN 2 Semarang and Junior High School 3 Semarang obtained data showed that 80% teachers and students interested in using media Kocerin because they are very attractive, but the problem is that LCD and Computer facilities in the classroom is not maximized or have not been in all classes.

5. To do revised the main products, based on input and advice from the initial field test results.
   In the repairing products of kocerin, material comparative and social arithmetic class 7 semesters 1 conducted to do operates accurate by the team and packaged attractively completed game based magic box that can be issue a description of the material, sample examples, quizzes, gradation interestingly
and the musical accompanied of the instrument so make the students more interested to use that. This is according with Sharma’s opinion (2013) that explained that by using interactive multimedia retention of students can be better.

6. To do main field trials, conducted on 30-100 subjects.
   In the main field trials, conducted well in two schools, they are Junior High School 3 Semarang and MTsN 2 Semarang, with each school subject as many as 15 students at level grade 7, the reason to choose this school because the school is very enthusiastic and cooperative in following the trial stage early, while the main field trials was accompanied by the teachers, they are Ms Yohana from Junior High School 3 Semarang and Mr. Andi Mustofa from MTsN 2 Semarang, then the teachers accompany the learning process from beginning to end as an observer in the classroom.

7. To do revised the operational product, based on input and suggestions the main field test results.
   In revising the product of KOCERIN (Smart Box Interactive) comparisons material and social arithmetic improvements have been made as follows:
   1) Writing and background that were previously not the contrast become contrast
   2) Instrumental music previously hard become slow
   3) Animations adjusted with ability to think of children SMP/MTs
   4) The comparison material dan social arithmetic made contextual, so it is easy to understand by students
   5) Keep your writing more standardized like Times New Roman, Arial and etc
   6) Quiz made more interesting with a variety of menu and a way to resolve

8. To do operational field tests (conducted with the involvement of 40-200 subjects), data were collected through interviews, observation, and questionnaires.
   In an operation field test in Junior High School 3 Semarang and MTsN 2 Semarang involving each school by 30 students, so hopefully input more complete from teachers and students because the number of respondents more, then in process of implementation of products Kocerin (Smart Box Interactive), students and teachers are required to give advice and input to product Kocerin by filling out questionnaires adn interviews directly, so really know the advantages and disadvantages of media with written and orally. This
is according with Yasemin (2006) that shows the learning online and offline media greatly assist students in learning.

**Figure 6. Kocerin Process in Implementing Operational Field Test**

9. To do repairing of finished product, based on suggestions in field trials. Based on the questionnaire responses of teachers and students toward Kocerin’s product obtained results that teachers and students MTsN 2 and Junior High School 3 Semarang are very pleased to use Kocerin’s product in comparison material learning and social arithmath class 7 odd semester 2016/2017 academic year, which is still lacking based on teacher’s opinion is the depth of the material and media design of renewable media need to fixed again, so the students more interested in following lessons in the classroom.
While the results of students’ response to comparison material kocerin product and social arithmetic shows the percentage of 87.39% and 90.42% means that media kocerin eligible for use in the learning process in SMPN 3 Semarang and Semarang MTsN 2
To know about effect from using KOCERIN product are doing posttest to material ratio / collation and social arithmetic in the SMPN 3 Semarang and MTsN 2 Semarang apparently as a result average of study output about materials ratio are 75 and 83, and arithmatic materials are 80,5 and 84,5, from the average of study output indicate that cognitive study output of MTsN 2 Semarang students is lower than cognitive study output of SMPN 3 Semarang, because student input while PMB is different, so it is natural if the result of study are different. But the posttest score output is better than the other class which don’t use KOCERIN media in material and social arithmatic with average score 71,5 and 70 in MTsN 2 Semarang and average
score 72 and 71 in SMPN 3 Semarang. This case is appropriate with Tiedth’s opinion (2004) explains that the good study output is very good that caused by the good learning media.

![The Result of Fraction Material Posttest](image1)

**Figure 11.** The result of posttest in the operational field

![The Result of Social Arithmetic Posttest](image2)

**Figure 12.** The result of posttest in the operational field

To inform and implement product, report and propagate product by meeting and scientific journal, cooperate with publisher for socialize product to commercial and observing distribution and quality control.
Meanwhile the last step of research model of Borg development and Gall are inform and implement KOCERIN product in a simultaneous manner in the Semarang region and around it for Junior High School level, but because of various obstacles on this inform research just limited on International journal in Scopus index, until can use as reference in this country and in abroad.

**CONCLUSION**

Based on the first research result about KOCERIN media prototype design (Interactive Smart Box) in this research conclude that:

1. Produced KOCERIN media (Smart Box Interactive) that appropriate for Junior High School to holistic learning
2. Teacher and students can use KOCERIN media (Smart Box Interactive) as learning supplement in the class.
3. Based on the testing from media specialist and material specialist indicated that KOCERIN media (Interactive Smart Box) is a media that suitable used by students, with the score from specialist material is 90% and media specialist is 89.33%
4. From the observation field result with this KOCERIN media (Smart Box Interactive) existence, student and teacher are very interesting with the percentage that are 87.3% and 90.4%
5. Experiment class score average is better than control class that is 84.5 more than 80.5.

**REFERENCES**


