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Feasibility Test of Mobile Learning with Schoology: Efforts to Foster The Students' Learning Interest on Magnetism

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Abstract. Recently, revolution 4.0 has become a major topic in various aspects. One of them is in education. Education is the first key to facing revolution 4.0 through digital learning. in the form of schoology needs to be applied to facilitate and foster the Digital learning students' motivation. This research is a Research and Development (R&D) research using Borg and Gall procedures. The results of material experts, media experts, and teachers validation reached very reasonable criteria. Then, the mobile learning with schoology applications was tested through two stages: small group trials and field trials in Junior High School. The result showed that it reached very reasonable interpretation criteria and could foster the students' interest in learning science.

1. Introduction

Industrial revolution 4.0 has become a significant topic in various aspects [1–3]. In revolution 4.0, everything is based on technology, even technology is not just as a tool to work, but as a work partner [4]. There must be a readiness to face the industrial revolution 4.0. One of them is in the education aspect because it is the first key to facing the revolution 4.0. For that reason, it is necessary to improve education quality through digital learning [5].

In education, digital learning is a solution to facilitate the students to understand the abstract learning [6–10]. One of them is science learning [11]. Science material has very big size, very small size, and cannot be touched directly by the students. Like material of magnetism, there must be media that can stimulate the material [12]. Learning media is not only used in the classroom but outside the classroom through internet learning (e-learning). Learning using online system allows educators and students to access the information flexibly without the limitations of space and time [13].

Many benefits felt by the teachers and students, so there are various types of e-learning development model, from power point based model to the Learning Management System (LMS) [14]. LMS is a resource management system used in web-based learning media [15], [16]. LMS is often known as CMS (Course Management System). Generally, CMS is built based on the web, will run on a web server and can be accessed by students through a web browser[17]. Various types of LMS have been used in learning. One of them is schoology [14, 18].

Schoologyis a website that combines e-learning and social network. The concept is the same as Edmodo, moodleandLCDS. Nevertheless, in term of e-learning, schoology has many advantages. Developing schoology based e-learning is also more beneficial when it is compared with Moodlebecause it does not need hosting and schoology management is more friendly for users. Features in schoology are courses, group discussion, resources, quiz, attendance, and analytics [19].

Based on observation and in three Junior High Schools or Sekolah Menengah Pertama (SMP)/Islamic Junior High Schools or Madrasah Tsanawiyah (MTs) in Bandar Lampung, almost all students have had android handphone with sophisticated features, and it is often called smartphone [20]. This is in line with the study conducted by communication and information ministry in 2014 which showed that 98% of surveyed children and teenagers know the internet and 79,5% was the internet users [20]. The use of smartphone among students is just for playing games and social media. A large number of smartphone users and the increasing number in the following years are an opportunity for developing the learning media on a smartphone to enhance the students' learning interest. It means this research is different from the previous studies. This research is about schoology which can be accessed through a smartphone, but the previous studies were about schoology which can just be accessed using a personal computer.

2. Method

This research used the Research and Development (R&D) method. The steps of Research and Developments are as follows:
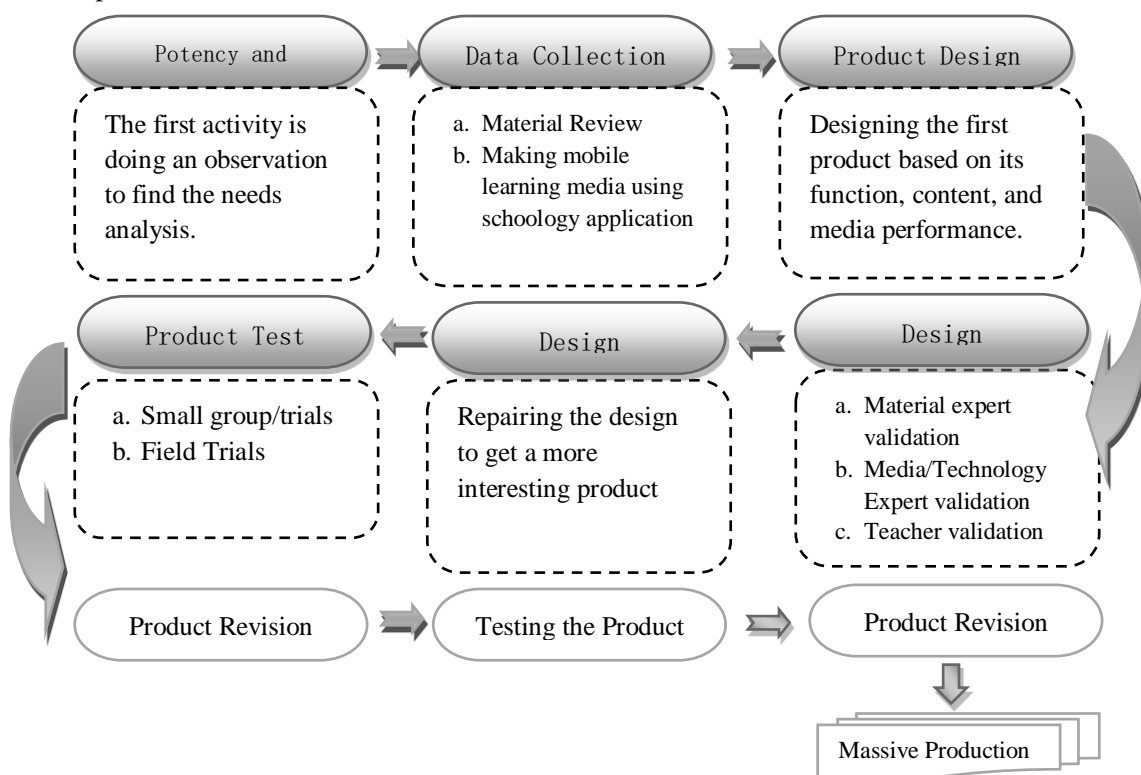

Figure 1. Research and Development Steps

Researchers limited the Research and Development steps, from ten to seven steps [21] because this research did not measure the effectiveness of the developed product. The final product of this Research and Development is in the form of physics teaching media.

The subjects of this research were the ninth grade students of MTsN 2 Bandar Lampung, SMP PGRI 6 Bandar Lampung and SMPN 1 Purbolinggo, East Lampung. Instruments used were product validation and users (teachers and students) response. The kind of research used was a mixed method with data analysis technique below.

a. Table 1 below shows the criteria for interpretation of the assessment results from media experts, material experts, and users' responses.

Table 1 Category of Scoring [22]

Category	Score
SB (SangatBaik/Very Good)	5
B (Baik/Good)	4
C (Cukup/Enough)	3
K (Kurang/Less)	2
SK(SangatKurang/Very Less)	1

b. Percentage from validators and users' response to each aspect is calculated using the following equation[23]:

$$x_i = \frac{\sum S}{S_{max}} \times 100\%$$

Note:

S_{max} = Maximal Score

$\sum S$ = Total of Score

x_i = Visibility Score every aspect

c. The average percentage from validators and users' response is calculated using the following equation[24]:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Note:

$\bar{x}$ = Final Average

x_i = Feasibility Score of Questionnaire every aspect

n = Number of Statement

d. Table 2 below is an interpretation of validators' average score and users' response:

Table 2 Interpretation of Learning Media Feasibility Scale [22]

Score	Criteria
$0 > \bar{x} \leq 20\%$	Not Feasible /Not interesting
$20 > \bar{x} \leq 40\%$	Less Feasible /Less interesting
$40 > \bar{x} \leq 60\%$	Feasible enough/Interesting enough
$60 > \bar{x} \leq 80\%$	Feasible /Interesting
$80 > \bar{x} \leq 100\%$	Very Feasible /Very interesting

3. Results and Discussion

The following are the results of some steps in developing the learning media, schoology:

1. Potency and Problems

The potency of research according to technology and communication development has a big possibility of learning using e-learning. Based on preliminary observation at MTs 2 Bandar Lampung, SMP PGRI 6 Bandar Lampung and SMP N 1 Purbolinggo, teaching and learning process has used e-learning in the form of power point and interactive video. Nevertheless, it still focused on the teacher. Because it is focused on the teacher, not all students paid attention to the teacher when he explained using media. Outside of the classroom, some students found the difficulties with the materials given by the teacher and they were so lazy to learn. So e-learning is needed to explain the materials which cannot be touched by the students, like material of magnetism, and can be accessed everywhere and can foster the students' motivation to learn.

2. Data Collection

Based on the previous problems, the researchers collected data by reviewing materials and media making tools, so e-learning media would be developed with schoology.

3. Product Design

Based on the problems and data collection, the researchers developed one of System Management Department which can be accessed flexibly. It is schoology. Then, the researchers designed the initial product in the form of mobile learning media with the schoology application as a way to foster the students' learning interest in achieving goals in accordance with the curriculum.

The process of making mobile learning media with the schoology application is by collecting materials to make media (picture and material) and making the initial product in the form of power point. After all, materials collected, product development consists of several material parts in the form of a power point. Presented in Figure 2.
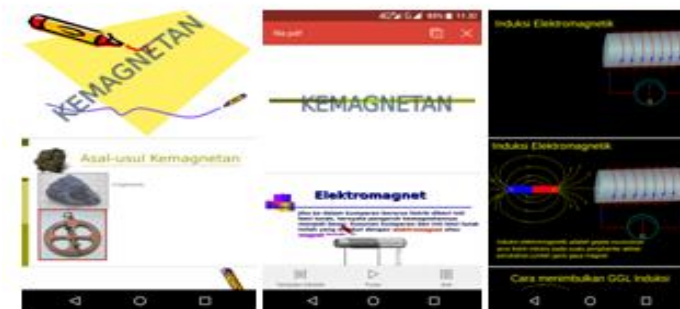

Figure 2. Materials in the form of power point (Product in the In

This figure shows various material components which are ready to be uploaded on social media schoology. Before uploading, the user must register an account to schoology first. After the registration is successful, the user must log in using the registered account. Then, the user can upload it to menu courses schoology(Figure 3 and 4).
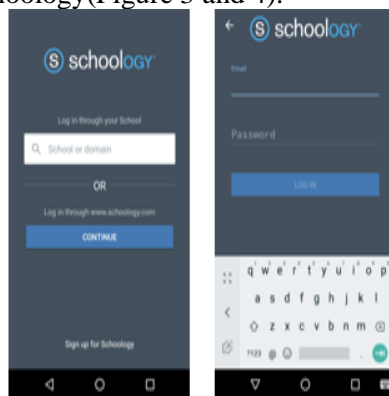

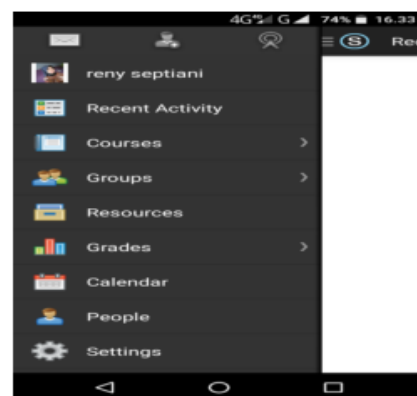**Figure 3.** Page of Login on Schoology media   **Figure 4.** Page of Schoology Menu

4. Design Validation and Revision

After uploading the material components on schoology, product feasibility must be measured by validating the product. Validation process includes validations from three material experts and three media/technology experts.

Material expert validation included 3 aspects: (1) Content quality; (2) Compliance and (3) Language. There are some suggestions from material validators. They are: adjusting the thought with the basic competence and indicator, then adjusting the materials with basic competence and indicator so that the students can focus more and the material doe not expand.

Table 3. The Result of Material Expert Validation in the First and Last Step

No	Aspect	First Validation (%)	Criteria	Last Validation (%)	Criteria
1	Content Quality	72 %	Feasible	78 %	Feasible
2	Compliance	77 %	Feasible	83%	Very Feasible
3	Language	80%	Feasible	87%	Very Feasible
	Total of Aspects	76%	Feasible	83%	Very Feasible

Table 3 shows the results of the material expert validation before and after making revision according to the validators' suggestions.the percentage of material feasibility in mobile learning media using schoology application was increased. In the content quality aspect, the initial step was 72%, and the final step was 78%. The content compliance 77% become 83% and language aspect 80% become 87%. The percentage increase occurs because the researchers have fulfilled the elements which are needed in learning media. Thus the materials in mobile learning media with schoology application in physics learning reaches a very feasible category.

Media/technology expert validation included two aspects. They were media aspect and technology aspect. Media validator gave research suggestion. It is paying attention to the application users' ease.

| Before Revision | After Revision |

After making revision or correction according to the media expert validator, the percentage results obtained.

Table 4 The Result of Media/Technology Expert Validation

No	Aspect	Percentage	Criteria
1	Visual Communication	85%	Very feasible
2	Technology	87%	Very feasible
	Total of Aspects	86%	Very feasible

In table 4, the result of media/technology expert validation on visual communication aspect was 85% and technology aspect 87% so that in mobile learning media with schoology application in terms of visual communication and technology are a very feasible category. Feasibility of the results of validation was caused by the fulfilled media/technology feasibility elements.

5. Users' Response (Teachers)

The product made was also needed to be responded by three physics teachers to know the feasibility of developed media. There were some suggestions from teachers: paying attention to the writing systematics/layout and using good and right language. After the product revised according to the teachers' suggestion, the following percentage results were obtained.

Table 5 The Result of Teachers' Response

No	Aspect	Percentage	Category
1	Learning	82%	Very Feasible
2	Engineeringof Learning Material	80%	Feasible
3	Visual Communication	82%	Very Feasible
	Total of Aspects	81%	Very Feasible

Based on table 5, it was obtained that the teachers' response to the three learning aspects was 82%, the aspect of teaching material engineering was 80% and the visual communication aspect was 82% so that the teachers' response regarding mobile learning media with schoology application was categorized as very feasible. Feasibility of teacher response because of mobile learning media with the schoology application with schoology application have fulfilled the elements of mobile-based learning media. Moreover, mobile learning use will be more effective and efficient in learning.

Based on the description of the data above, the total feasibility percentage of each material expert, media/technology expert, and teacher response are as follows:

Tabel 6 The Result of Validations

No	Validations	Percentage	Criteria
1	Material	83 %	Very Feasible
2	Media/Technology	86 %	Very Feasible
3	Teachers	81 %	Very Feasible

Based on table 6, the recapitulation of material expert validation result obtained percentage 83%, the validation of media/technology expert 86%, and the teachers' response 81.33% so that the total of validations result was 80.83%. It means the feasibility level of mobile learning media with good schoology application from the material, media and teachers' response can be categorized as very feasible to be used in physics learning.

6. Small Group Trials and Field Trials

Researchers conducted small group trials and field trials to measure the attractiveness of mobile learning media with the schoology application. The following is the result of the trials.

Table 7. The Result of Trials

No	Aspect	Small group	Criteria	Field Group	Criteria
		Percentage (%)	Percentage (%)		
1	Media Engineering	74%	Interesting	85%	Very Interesting
2	Visual Communication	80%	Interesting	88%	Very Interesting
3	Learning	75%	Interesting	83%	Very Interesting
	Total Aspects	76%	Interesting	85,3%	Very Interesting

Trials were conducted at MTsN 2 Bandar Lampung, SMP PGRI 6 Bandar Lampung and SMP 1 Purbolinggo. Based on table 7, the result of small group trials from media engineering aspect was 74%, visual communication was 80%, and learning was 75% with a total percentage of 76%. It means, the small group trials reached an interesting category. Moreover, the mobile learning media with schoology application is categorized as interesting if it is applied in physics learning. The result of field trials from the media engineering aspect was 85%, visual communication was 88%, and learning was 83% with a total percentage of 85.3%. It means the field trials category were very interesting. For that reason, mobile learning media with schoology application is categorized as very interesting if it is applied in physics learning.

Based on the validation result, mobile learning media with schoology application is feasible to be applied. And the results of small group trials and field trials showed that mobile learning media using schoology application is interesting to be applied to physics learning. It will foster students' motivation to learn better. And this research first steps to answer the challenges of the industrial revolution 4.0. In addition, mobile learning media with schoology application can be used to monitor the development of students outside of school because the material and tasks can be accessed through a smartphone. Based on the previous researches, schoology which is developed can only be accessed using personal computers. But in this research, it can be accessed through smartphones or personal computers. This research is in line with [25]–[27].

4. Conclusion and Suggestion
Conclusion
One of preparation for facing the industrial revolution 4.0 through digital learning is using mobile learning. This research has produced a product schoology application for physics learning, especially material of magnetism. The result of material expert validation was 83%, media/technology expert validation was 86%, teacher validation was 81%. Those three validations reached very feasible criteria. The result of trials of mobile learning media with schoology, the total of average score of trials in a smallgroup was 76%, and the total of average score of trials in the field was 85.3%. It was done in three institutions including MTsN 2 Bandar Lampung, SMP PGRI 6 Bandar Lampung and SMPN 1 Purbolinggo, East Lampung with the feasible category. In general, mobile learning media with schoology application is feasible and attractive so it can foster students' motivation in learning physics.

Suggestion
In this research, the stimulation used is not interactive yet when it is used on a smartphone. Nevertheless, it can be interactive when it is operated using a personal computer.

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