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Development of Learning Applications "e-Mole B" in Badminton Games
Development Application of the "e-Mole B" for Learning Badminton

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Abstract

The purpose of this study was to develop an electronic-based badminton learning application called "E-Mole B". The method used in this research is research and development or R&D. Product trials were carried out at SMPN 4 Ciawigebang. With a small sample size of 10 extracurricular student respondents and a large scale test of 35 grade 7 student respondents at SMPN 4 Ciawigebang. The results of this research are based on a small scale test of 85% in the "feasible" category and a large scale test of 87.50% in the "feasible" category.

Keywords:*application, e-mole b, badminton*

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INTRODUCTION

Badminton is a sport that uses a racket as a hitting tool and a shuttlecock as an object to hit and is played by two players (for singles) or two pairs of players (for doubles) with opposite positions on the badminton court separated by a net in the middle of the court (Dahniar Widya Puspita Dewi et al., 2021; Putra & Sugiyanto, 2016). At the educational level, the game of badminton is small ball game material given in the subject of Physical Education, Sports and Health. Badminton games are given at all levels of education, starting from elementary school to high school (Dahniar Widya Puspita Dewi et al., 2021). The initial stage for mastering badminton techniques is to start with an introduction.

The process of introducing basic techniques can be done by providing direct explanations followed by examples of movements in front of athletes or by using teaching media as a learning tool, such as providing reading books/knowledge about badminton, watching training videos, looking at pictures/posters (in order- order of execution) and so on (Alhusin, 2007; Tomm, 2019). The next stage to master badminton techniques is to try to do/demonstrate the techniques taught repeatedly (practice stage) (Purnama, 2013; Saleh Anasir, 2010). The process of introducing the basic techniques described can be presented simultaneously without having to separate them. Merging can be done using software (software) Macromedia Flash or Microsoft PowerPoint. The merging of these media is known as the final product in the form of interactive multimedia (Sofyan & Purwanto, 2008). In practice, the use of interactive multimedia using Macromedia Flash as learning media is much better than using Microsoft Power Point (Sahayu, 2013). In the clubs that researchers observed, the process of introducing basic badminton techniques to athletes was by providing direct explanations followed by examples of movements.

Technical movements in badminton take place quickly between the preparation and implementation phases. The limited sense of sight of athletes to digest information in the form of movement demonstrations (techniques), so far coaches have overcome this by moving slowly (Winarno, 2019). However, in this way there is a difference between the actual movement and the movement made slowly as a way of exemplifying the movement to the athlete in the technique introduction process. For example, the shuttlecock often doesn't hit or doesn't reach its destination when demonstrating hitting techniques to students (by slowing down). The use of learning media, one of which can overcome the limitations of space, time, and sensory power, such as movements that are difficult to see and pay attention to through repeated video playback (Nur Khomarudin, 2018; Winarno, 2019a). By using learning media, problems when introducing techniques can be resolved. This learning media will function as a solution, if in learning basic badminton techniques you use electronic media as a means for introducing badminton techniques (Aripin, 2018).

However, the schools that researchers observed still use very little electronic media as a learning tool (Sharples, 2007). The urgency of this research can be seen from the low use of electronic media when practicing basic batminton techniques , apart from that the learning media used is still not effective so there is a need for a new media, namely "e-Mole B". If you are studying basic badminton techniques, electronic media is used as a means of introducing badminton techniques(Cabelo, D. M., & Gonzalez, 2003; Warsita, 2018). However, the schools that researchers observed still use very little electronic media as a learning tool. The urgency of this research can be seen from the low use of electronic media when practicing basic batminton techniques, apart from that the learning media used is still not effective so there is a need for a new media, namely "e-Mole B". If you are studying basic badminton techniques, electronic media is used as a

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means of introducing badminton techniques. However, the schools that researchers observed still use very little electronic media as a learning tool. The urgency of this research can be seen from the low use of electronic media during basic badminton technique training, besides that the learning media used is still not effective so there is a need for a new media, namely "e-Mole B".

METHOD

This research uses the Research and Development (R&D) method. R&D or Research and Development is research that starts with continuous product testing. Furthermore, in this research the researcher took various steps to obtain good research results. This research stage consisted of several stages, namely, literature study, problem formulation, system development, system testing, drawing conclusions. The R&D model used uses the Software Development Life Cycle with a prototyping approach, namely software development that first describes the design in prototype form as a functional requirement that will be approved by the user.(Wibowo Adie & Arifudin, 2016). The location for this research is SDN Cipasung with 58 grade 4 students. The following is the research flow diagram:

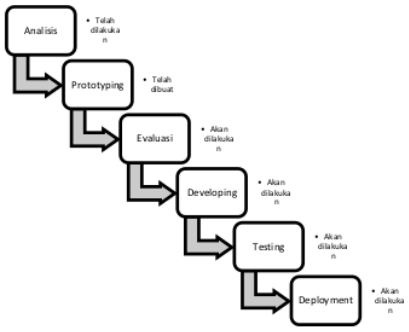

Figure 1. Research Flow Chart

The following is an explanation regarding the diagram:

1. Needs Analysis

In the first stage of this study, research conducted an analysis of student needs. In this needs analysis, the researcher interviewed teachers and several students to obtain data as research study material. From the results of this analysis it was found that students still had great difficulty working on unusual math problems, which are better known today as numeration problems, so media were needed that could help and accompany students in learning mathematical numeracy. Therefore the researcher tries to solve this problem by developing a mobile learning application to help students learn numeracy which is called "e-Mole B". The application has been made complete according to student needs, starting from material, sample questions, and practice questions.

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2. *Prototyping*

From the results of the needs analysis of teachers and several students, a prototype was created as an initial illustration of the "e-Mole B" design. As in the following picture:

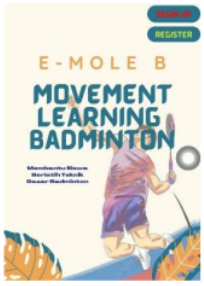
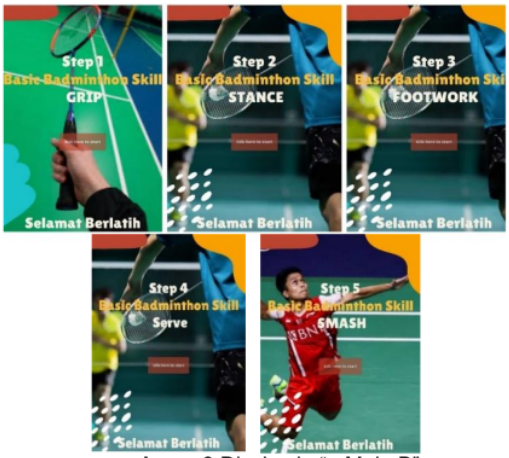


Figure 2. Front View of "e-Mole B"



igure 3. Display in "e-Mole B"

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No	Basic Badminton Skill	Types	Movement learning		Student/ Player (ceklist)	Teacher/ Coach (ceklist)	Tahapan
			Deskripsi	link youtube video sampel			
1	Grip	Back Hand	Teknik *backhand grip* dapat dilakukan dengan cara menggenggam tangkai raket, lalu memosisikan ibu jari di belakang tangkai dan menekannya seolah-olah ibu jarilah yang menjadi penyokong raket.				1
		Foreheand	Jika teknik *backhand grip* menggunakan ibu jari sebagai penyokong utama, teknik *forehand grip* menggunakan jari telunjuk, tengah, manis, dan kelingking sebagai penyokongnya. Umumnya, teknik ini dilakukan untuk gerakan permainan yang lincah.				
2	Stance	Defensive Stance Net Stance	Untuk menerapkan posisi bertahan, player harus mengarahkan badan menghadap net dan memosisikan raket di depan pinggang/perut. *Net stance* biasanya dilakukan ketika lawanmu tampak ingin melakukan *netting*. Untuk mengantisipasi *netting*, player harus berada di dekat *net*. Setelah itu, raket perlu diposisikan di depan tubuhmu, sementara badan dimajukan sedikit agar siap melakukan lompatan ke depan.				2
3	Footwork	Move Only 2-3 steps Backward	Bergerak 2 sampai 3 langkah ke belakang				3
		Shuffle only 1 step sidewards	Bergerak 1 langkah ke samping				
4	Serve	Move only 2-3 Steps front High Serve	Bergerak 2 sampai 3 langkah ke depan Servis atas dilakukan dengan cara memukul kok menggunakan raket yang posisinya di atas bahu atau kepala. Biasanya, laju kok akan cenderung horizontal.				4
		Low Serve	Servis bawah dilakukan dengan cara memukul kok menggunakan raket yang posisinya di bawah bahu atau dada. Biasanya, laju kok akan cenderung melambung.				
5	Smash	Forehand smash Back Hand smash	Teknik *forehand smash* adalah pukulan kok kuat yang dilakukan di atas kepala. Teknik *backhand smash* merupakan salah satu teknik yang paling sulit dilakukan di dalam permainan badminton, bahkan para profesional saja kesulitan melakukannya. Untuk melakukan teknik ini, kamu harus menggunakan teknik genggaman *backhand grip*, lalu melepaskan pukulan yang kuat.				5

Figure 4. Contents of the material "E-Mole B"

3. Application Evaluation and Revision
   The application that has been created will then be validated by material experts, media experts and potential users, in this case students, to get feedback. The feedback obtained is used to revise the application design. This is done repeatedly until no more feedback is obtained so the application design is declared final.
4. *Developing*
   This stage is writing code using a programming language to create an application. The programming language used is HTML, CSS, Javascript, PHP and is supported by a MySQL database, because the application will be based on a web application.
5. *Testing*
   After the application is made at the developing stage, testing is then carried out at the system level, then at the small-scale user level and large-scale user level. At the system level, testing is done by testing the functionality of whether the application is functioning properly. Furthermore, at the small-scale testing stage, it is carried out by asking several users to use the application to be asked for feedback, or in other words as a user acceptance test. Furthermore, at the large-scale testing stage, it is carried out using an application as a badminton learning aid for the experimental class.
6. *Deployments*
   If the test results state that the application is complete, the last step is publishing the application to the Play Store so that it can be accessed by everyone.

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RESULTS

Results of "e-Mole B" Based Badminton Learning Application Development

Development of application-based badminton learning media. The initial product produced was called "e-Mole B" to Improve Students' Fundamental Skills. This "e-Mole B" Based Badminton Learning Application development product was developed to provide convenience in learning badminton using applications as learning media.

1. Product Research Results "e-Mole B"

a. Expert Validation

The development of e-Mole B" is validated by experts in their field, namely an application media expert. The application media expert who became the validator in this development research was Sofhian Fazrin Nasrulloh S.Pd, M.Eng. The expert review produced the following results

Table 1. Results of the Expert Validation Assessment of the First Phase "e-Mole B" application design

No	Statement	Evaluation				Note
		1	2	3	4	
I	**Design Aspect**					
A.	**Contents**					
1.	Size			√		
2.	Design arrangement				√	
3.	Color and display			√		
B.	**Writing**					
1.	The size of the writing on the guide		√			
2.	Stylists writing on guides		√			
C	**Color**					
1.	Basic application color			√		
2.	Example implementation guide			√		
III	**Usage Aspect**					
1.	Provides user effectiveness			√		
2.	Learning is more effective and efficient			√		
3.	Assist teachers in implementing learning			√		

Based on the results of validation, experts produce the following data

Table 2. Data on the Results of "Development of a Multifunctional Ball Throwing Equipment" First Stage Material Expert.

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No.	Rated aspect	Earned Score	Maximum Score	Percentage(%)	Category
1	Application design	30	40	75%	Pretty decent

Based on the data obtained, it can be concluded that the Badminton Learning Application Based on "e-Mole B" can be categorized as "quite feasible" with a percentage of 75%.

2. Small Group Trial

A small group trial was carried out on 10 respondents of badminton extracurricular students at SMP Negeri 4 Ciawiigebang, the trial was carried out in 1 meeting. The conditions during the small group trial as a whole can be described as follows. (a) Description of the operating conditions of the tool. (b) Respondents' use of e-Mole B seemed enthusiastic. . (c) Conditions when filling out the questionnaire, respondents pay attention to the explanation regarding the procedures for filling out the questionnaire, students fill in carefully.

Table.3 Small Group Trial

No.	Rated aspect	Average Score Obtained	Maximum Score	Percentage (%)	Category
1	Application design	34	40	85%	Worthy

The results of the questionnaire of respondents or athletes regarding the "e-Mole B Based Badminton Learning Application" showed that 85% of the assessment regarding the application design aspects were categorized as "Fine" which can be interpreted as meaning that the application is suitable for testing to the next stage.

3. Large Group Trial

Field trials were carried out on 35 respondents at SMP Negeri 4 Ciawigebang. Field trials were carried out in one meeting. Conditions during the field trials as a whole can be described as follows. (a) The condition of the operational explanation of the respondents seemed enthusiastic, curious and asked questions to the teacher and researcher when given an initial explanation regarding the "e-Mole B" research that would be carried out. (b) The condition of using "e-Mole B" shows concentration and enthusiasm. Several students asked about unclear material and procedures for using "e-Mole B". (c) Conditions when filling out the respondent's questionnaire went smoothly, starting with the researcher explaining the procedures for filling out the questionnaire. While respondents or athletes pay attention to the explanation regarding the procedures for filling out the questionnaire, respondents fill out the questionnaire carefully.

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Table 4. Results of the Large Group Trial Questionnaire

No.	Rated aspect	Average Score Obtained	Maximum Score	Percentage (%)	Category
1	Application design	35	40	87.50	Worthy

The results of the respondent questionnaire regarding the research "Badminton Learning Application Based on "e-Mole B" showed an assessment of the material design of 87.50% which was categorized as "Decent".

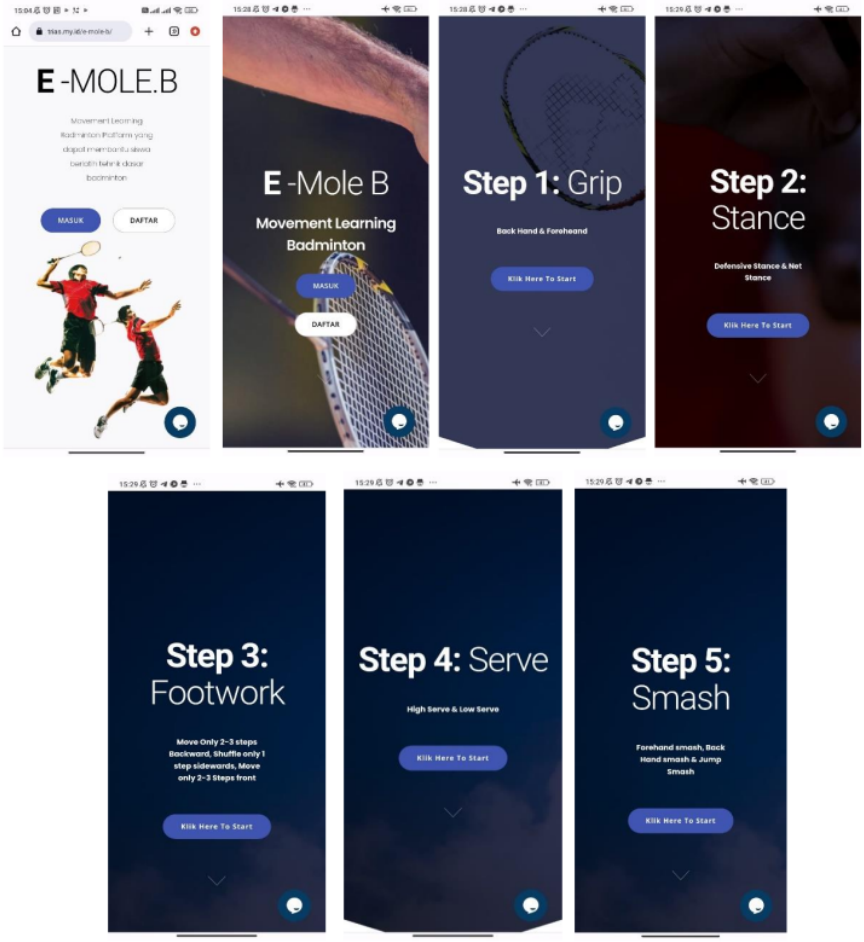

Figure 5. The e-Mole B application

C. Discussion

Development of a Badminton Learning Application Based on "e-Mole B"

At the beginning of the development of e-Mole B, it was designed and produced as an initial product in the form of a learning application used for educational badminton games. The development process goes through research and development procedures.

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Through several planning, production and evaluation. Then the product is developed with the help of someone who has mastered application creation. After the initial product is produced, it needs to be evaluated by experts through expert validation and needs to be tested on respondents. The evaluation stage was carried out by media experts. The next research stage was carried out with one-on-one product trials, small group trials, and field trials.

The quality of "e-Mole B" is included in the "Decent" criteria. This statement can be proven from the results of the analysis of "Decent" assessments from experts, both experts, as well as in the assessment of one-on-one trials, small group trials and field trials. Students feel happy and enthusiastic about this product because respondents are interested in trying to operationalize it, this product can be distributed widely as other training aids.

CONCLUSION

It can be concluded that the development of a badminton learning application based on "e-Mole B" can be said to be suitable for use in badminton learning. Furthermore, the application of the “e-Mole B” Based Badminton Learning Application can Improve Students' Fundamental Skills.

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