Development of Basic Teaching Materials for Table Tennis in the Form of Interactive Multimedia for Education Students Sport Development Faculty of Sport Science Padang State University

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Article Info	Abstract
	Based on observations and the results of needs analysis in the field, the learning process for table tennis subjects so far still has many shortcomings and needs to be addressed, the presentation of the material content is very complex and difficult to understand, the learning method used is relatively monotonous and does not utilize available learning media, lecturers are still used as the only source of information, so students become less active and creative. So that the process of achieving learning objectives is a little hampered. The purpose of this research is to develop learning resources and media for students in particular and the wider community in the form of table tennis teaching materials in the form of interactive multimedia. This type of research is research and development using the Lee & Owen development model. The data analysis technique used descriptive qualitative analysis in the form of initial observation data and needs analysis and input. The results of the analysis in the form of validation and testing of the developed product can be reported as follows: (1) media expert validation showed 89.65% results, (2) material expert validation showed 97.22% results, (3) evaluation expert validation showed 68 results, 7%, (4) small group trial data 74.17%, (5) large group trial data 75.19%.

INTRODUCTION

The learning process can also be interpreted as learning. According to Law No. 20 of 2003, concerning the National Education System Chapter 1 Article 1, "learning is a process of interaction between students and educators and learning resources in a learning environment." (students), lecturers (educators) and users of supporting facilities and infrastructure as well as with various kinds of learning methods.

The learning methods vary, some are fully held by educators, some are shared with students, and some are held by students (Daryanto, 2015) making it easier for educators and students in the stages of the learning process. When we use the concept of "interactive media" exclusively in relation to computer-based media, displaying films on the screen through a counter-responsive system can trigger user interactions, so that in that context can be considered interactive (Manovic, 2002). To clarify information or to facilitate understanding of the information presented, the use of instructional media, such as videos, films and pictures, will greatly assist the efficiency and effectiveness of the learning process. It should be understood that videos or films have the advantage of presenting information about a movement because videos and films can be played or presented repeatedly with the same quality. While the movement demonstration or demo can be done repeatedly, the quality is different (Kiram, 2016).

The character of students needs to be observed in the implementation of learning activities. The teaching materials provided must be designed to make digital (digital native) a must meet the need to achieve an increase in the quality of learning and the availability of teaching materials that are in accordance with the curriculum and suitable for creating digital (digital native) are expected to solve problems. Likewise, teaching materials for Basic Table Tennis courses must be in accordance with the curriculum and match the character of students belonging to the digital native generation so that teaching materials are attractive and high-powered by utilizing technology devices for learning objectives to run efficiently and effectively.

The purpose of this development is to produce a product in the form of basic table tennis learning materials for students of the Sports Coaching Education Study Program, FIK UNP.

It is hoped that the interactive multimedia-based teaching materials can help and facilitate students in understanding basic table tennis learning materials during lectures.

METHOD

The research method used in this research is development. In the development of basic table tennis teaching materials in the form of interactive multimedia, a procedural model is used, namely a descriptive model outlining the steps that must be followed to produce a product. In the context of this research, the researcher uses the development model developed by Lee & Owens (2004) because this development model refers to the development model for multimedia.

Participant

The trial subjects in development research sequentially are expert evaluations (expert evaluations, consisting of media experts, learning experts and material experts (practitioners/coaches) and evaluations and students of the Sports Coaching

Education Study Program FIK-UNP, The object of this research is the result of the development of the media of teaching materials, the subjects of the small group trial are 30 students of the sports education study program

Sampling Procedure

The sample was carried out in 2 ways, by applying a small group trial conducted on students of the Sports Coaching Study Program who were taking basic table tennis lectures conducted by 10 participants (Dick & Carey, 2009) using (random sampling) because it was random without regard to the strata involved. exist in the population.

Large group trials are related to testing the validity and reliability of the compiled products. Large group trials were carried out on students who were undergoing Basic Table Tennis lectures consisting of 30 participants (Prabowo, 2022). The subject of this research was taken by random sampling method.

Procedure This Is

To develop this Basic Table Tennis teaching material, it adopted the development procedure developed by (Lee & Owens, 2004). There are 5 steps of a development procedure that aims to develop Basic Table Tennis teaching materials in the form of interactive multimedia for Sport Sport students at Padang State University, including:
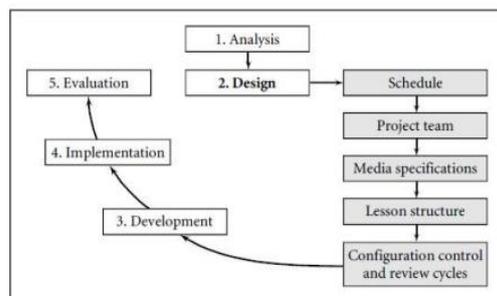
Picture 1. Analysis

1. Analysis
   The analysis stage is a needs assessment. The needs analysis stage is carried out by interviewing the lecturers who are in charge of the subject and collecting data using needs analysis for students of the Sports Coaching Study Program who take in the table tennis course in the Sport education program, FIK UNP, Basic Table Tennis

2. Product Design (Design)
   The design stage is the product design stage, designing media related to what will be included in the layout and collecting materials related to Basic Table Tennis lesson materials for FIK-UNP Sports Coaching students which contain materials, videos, pictures.

Picture 2. Table Tennis

3. Development (Development) In this stage, carried out the development of Basic Table Tennis teaching materials in the form of interactive multimedia for FIK-UNP Sports Coaching students is related to Basic Table Tennis learning materials.

4. Implementation (Implementation) The implementation stage is the product trial stage. This stage is in the form of small group trials and large group trials, namely assessing user responses and ratings after using the product which is reviewed from several aspects by using a questionnaire. In this study, the pilot phase involved students who took the

Basic Table Tennis course as many as 10 students were taken randomly (random sampling) for small group trials and 30 students were taken by random sampling technique.

5. Evaluation (Evaluation)

The evaluation stage is carried out to process the data resulting from the validation of experts, namely media experts, learning experts and material experts as well as trials. This is to find out the priority of the product after using this developed product.

Technical Analysis

Technical analysis in this study used qualitative descriptive analysis in the form of input, expert criticism and quantitative descriptive analysis to analyze the data obtained from the results of distributing small group trial questionnaires, large group trials. The results of data analysis become the basis for improving product development.

RESULTS

1. Media Experts

Product designs made by researchers validated by media experts who are lecturers in the Department of Electrical Engineering (FT-UNP). Media expert validation uses a questionnaire instrument with 5 sub-variables and a total of 29 statements. From these data for the whole product, the average result is obtained with a percentage of 89.66%. The assessment consisted of text obtained by 87.5%, images/photos 94.4%, audio/sound 80%, video 91.6%, design/display 93.75%.

Table 1. Results of Validation of Media

No	Indicator	Percentage	Key
1	Text	87.5%	SV
2	Image/Photo	94.4%	SV
3	Audio/Sound	80%	SV
4	Video	91.67 %	SV
5	Design/Display	93.75%	SV
	Average	89.66%	SV

2. Experts Product Material Experts

Made by researchers who were validated by material experts who are lecturers courses table tennis Material expert validation uses a questionnaire instrument with 5 sub-variables and 37 questions. From these data for the entire product, the average result is obtained with a percentage of 97.22%. The assessment consists of product achievement criteria ad off 95.31%, material accuracy criteria obtained 100%, criteria according to table principles obtained 100%, criteria for user convenience in understanding the material obtained 100%. And the attractiveness of the learning material obtained is 96.43%.

Table 2. Results of Validation of Material

No	Indicator	Percentage	Ket
1	Clarity 95.31	%	SV
2	Accuracy	100%	SV
3	Conformity	100%	SV
4	Ease	100%	SV
5	Attractiveness	96.43%	SV
	Average	97.22%	SV

3. Expert evaluation

Made by the researcher was validated by the evaluation carried out using a questionnaire instrument with 2 sub-variables and 5 questions

per item. Of the 5 questions for the entire product, the average percentage was 68.7%. The assessment consists of material assessment obtained as much as 70.35%. Evaluation of evaluation material II obtained as much as 69.06%. Evaluation of evaluation material III obtained as much as 67.25%.

Table 3. Expert Validation Results Evaluation

No	Indicator Key	Percentage	70.35
1	1	%	SV
2	2	69.6%	SV
3	3	67.25%	SV
Average		89.66%	SV

Based on the results of the evaluation and validation of experts, namely, experts media, material experts, evaluation of the developed product. Furthermore, the product can be tested in large groups and small groups as well as in field tests.

1. Results of the Small Group

Trial Small group trial using a small group trial instrument in the form of a questionnaire given to 15 students majoring in Sports Coaching Education FIK-UNP who were taking table tennis lectures by random sampling using scores of each answer 4,3,2,1 which refers to the scoring rubric (Akbar, 2015:97).

Tabel 4. Results of the Small Group

No	Aspect	Result	Percentage
1	Attractiveness	448	76.47%
2	Ease	363	75.62%
3	Clarity	108	60%
4	Feasibility	108	90%
5	Accuracy	130	72%
Total			74.17%

2. Test Result Large Group Test

a small group of products developed to meet the criteria obtained were (74.67%) quite valid, criteria (75.62%) very valid, criteria (60%) quite valid, criteria (90%) very valid, and criteria accuracy (72.22%) is quite valid.

The data from the product group trials that were developed to test the criteria obtained were (74.58%) quite valid, the convenience criteria (74.58%) quite valid, the criteria (75.56%) very valid, the criteria (81 .25%) is very valid, and the accuracy criteria (74.44%) is quite valid.

TABEL 5. TEST RESULT LARGE GROUP

No	Aspect	Results	Percentage
1	Attractiveness	895	74.58%
2	Ease	716	74.58%
3	Clarity	272	75.55%
4	Feasibility	195	81.25%
5	Accuracy	268	74.5
Total			75.19%

Development Results

ProductThe results of this study are table tennis teaching materials in the form of interactive multimedia. The details of the research product are as follows.

At the beginning of the opening, there are video clips of table tennis athletes hitting a table tennis match with a duration of ± 60 seconds, accompanied by a "START" button to go to the next page (home page) and there is also a button.

Picture 3. Video Clips

The next page is the start page (homepage) with a table tennis court as a background, a ball and a net in the middle, which contains the title of the product, the right corner contains the volume button and several menu buttons, namely, User Guide menu, syllabus menu & lecture plans semester (RPS), lecture material menus, quiz menus and practice questions as well as a profile from the author of

"Use Instructions" can be used for beginners who cannot use the product.

Picture 4. Product

The syllabus and RPS menu buttons contain presentations or brief descriptions of the contents of semester lecture activities contained in the FIK-UNP Sports Coaching Education Study Program, which are guidelines for the manufacture of table tennis products in the form of multimedia packaged in scrolling text format.

the menu material contains table tennis lecture material which consists of; (1) History of table tennis (2) Infrastructure (3) Basic techniques, (4) Ball feeling, (5) Rules, (6) Score sheet, (7) Handbook The

The lecture material is history which contains the history of table tennis, table tennis institutions, the development of table tennis in Asia and the development of table tennis in Indonesia in scrolling text format.

The sub-menu of this infrastructure contains table tennis tables, table tennis nets, table tennis balls and table tennis bets in scrolling text and image formats.

The sub-menu of the lecture material, the basic techniques of table tennis, contains grip, stance, footwork and stroke in scrolling text and video formats that explain how to perform the basic table tennis techniques.

The sub-menu of the lecture material is ball feeling which contains an explanation of ball feeling in scrolling text format and is also accompanied by videos of the forms of exercise and how to do it rolling.

Picture 5. Product

The sub-menu of the lecture material is the menu score sheet which contains the score sheet for table tennis matches in the form of Pictures. The

The sub-menu of the lecture material is the Handbook material which contains the rules for table tennis matches issued by the ITTF (International Table Tennis Federation).

The quiz menu contains questions related to table tennis and 25 questions (multiple choice) made from Adobe Quiz Creator software, which is a software to create quizzes in various formats including flash (swf), web, LMS, DVD / exe, e-mail and ms office. In the

quiz menu, the system automatically knows the results by being able to see the extent of user understanding after learning the product of table tennis in the form of interactive multimedia.

Picture 6. Product

There is a menu profile button, which contains the profile information of the product maker of table tennis teaching materials in the form of interactive multimedia in scrolling text format

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DISCUSSION

The availability of a whole series of learning activities in this developed product can reduce activities that cause learning to be inefficient and provide student materials that have been difficult for students to access. This basic table tennis teaching material product allows users to learn independently which involves users actively finding material concepts, encouraging users to try and do independently on the material accessed by media users.

The advantage of this teaching material is that there are various kinds of media such as audio, video, and text. The researcher agrees with the statement (Smaldino et al., 2011) that teaching materials are made to facilitate independent learning and these teaching materials are formed into printed materials, audio-visuals, or any

combination thereof). The same thing was also stated by (Barnard et al., 2009) to help explain the concept of ideas and help motivate active learning participants by involving multimedia (computers, laptops and tablets).

The combination of media and appropriate learning strategies is also believed by many parties to be able to increase the motivation to learn. It is also similar to the statement that the selection of appropriate procedures involving multimedia will attract the attention of students to learn (Asrika Mahadewi, 2013).

Table tennis lectures have the same goals in learning PJOK at school, namely in cognitive, affective and psychomotor aspects. However, these three aspects cannot be separated, considering that they only focus on one aspect. The results of table tennis learning do lead to psychomotor, which are more demanding of skilled skills in table tennis abilities. Therefore, to produce good psychomotor learning stages are needed starting with cognition, association and automation (Kiram, 2019). Table tennis lectures are conducted in one semester of activities consisting of 16 meetings and each meeting consists of 2 credits (1 credit = 45 minutes).

In addition, the role of interactive multimedia can increase interest and motivation to learn. As stated by (Kavita et al., 2013) the use of computer technology in teaching physical education can increase students' interest and motivation in comparing physical education with the use of traditional methods.

The developed teaching material products are also in accordance with the character of today's students. This is in line with what (Palfrey & Gasser, 2008) students prefer interactive teaching materials because they are categorized as

digital natives, while teachers and parents are likened to "comers" in the world of digital technology (digital immigrants).

Then, the benefits of table tennis teaching materials in interactive multimedia can help in the process of transferring information that occurs in coherent and systematic learning. This is in accordance with Raibowo, (2020) that learning materials produced with the help of the use of technology (systems) will appear more integrated and systematic, providing deeper and broader information for learning.

In addition, the role of teaching materials in the form of interactive multimedia can trick students through student events. This is in line with the statement of Dwiyogo (2013) that learning events are stages of learning called nine instructional events, namely, getting, conveying, generating (remembering), presenting stimuli, providing tutoring, eliciting, assessing performance, providing feedback and increasing retention.

The diversity of media and learning resources will serve as a means of student interaction with other students or teachers so that the learning process will run optimally and the desired goals are achieved.

CONCLUSION

Based on the results of data analysis processing and the discussion that has been described previously regarding the product development of basic table tennis teaching materials in the form of interactive multimedia with expert validation showing results of 89.65%, material expert validation shows results of 97.22%, evaluation expert validation shows the results of 68.7%, data from small group trials 74.17%, data from large group trials 75.19% and data obtained from field tests of the development of basic table tennis teaching materials in the form of interactive multimedia effective on learning outcomes, because there is a change in the score before and before using the product developed with the value. The products resulting from the development of these teaching materials are very efficient and also interesting for learning.

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