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Postgraduate School - Universitas Negeri Medan

AISTEEL

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Schedule of The 5th Annual Internatioanal Seminar on Transformative Education and Educational Leadership (AISTEEL) 2020
Postgraduate School, Universitas Negeri Medan

22 September 2020

(Indonesian time)	Activities	PIC/Moderator
07.00 – 08.30 (am)	Preliminaries	committee
08.30 - 08.45 (am)	**Opening Ceremony** 1. MC Speech 2. Indonesian National Anthem 3. Pray 4. Chairperson Report 5. Welcoming speech of Director of Postgraduate School 6. Welcoming speech and official opening of Rector of Universitas Negeri Medan 7. Photo session	MC (Dr. Anni Holila Pulungan, M.Hum & Sofianto Gultom, S.Pd)
08.45 – 09.25 (am)	Keynote Speech 1: **Prof. Dr. Syawal Gultom, M.Pd** (Universitas Negeri Medan– Indonesia)	Dr. Rahmad Husein, M.Ed
09.25 – 10.05 (am)	Keynote Speech 2 **Prof. Emmanuel Manalo** (Graduate School of Education, Kyoto University, Japan)	Prof. Amrin Saragih, PhD
10.05 – 10.45 (am)	Keynote Speech 3 **Dr. Susan Ledger** (Head of Education, Murdoch University - Australia)	
10.45 – 11.25 (am)	Keynote Speech 4 **Prof. Dr. Ekkarin Sungtong** (Dean of Faculty of Education Prince of Songkla University - Thailand)	Mangara Simanjorang, PhD
11.25 – 12.05 (am)	Keynote Speech 5 **Assoc. Prof. Yuri Uesaka** (The University of Tokyo - Japan)	
12.05 – 13.30	**Break**	
13.30 – 15.30 (pm)	**Parallel Session 1** **(divided to 19 parallel rooms)**	Moderator/Operator
15.30 – 15.35 (pm)	Break	
15.35 – 17.00 (pm)	**Parallel Session 2** **(divide to 19 parallel rooms)**	Moderator/Operator
17.00 – 17.10 (pm)	Cloossing	committee

**Proceedings of the 5th Annual International Seminar on Transformative Education
and Educational Leadership (AISTEEL 2020)**

Preface

The fifth Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2020) was held by virtual seminar on 22 September 2020. This seminar is organized by Postgraduate School, Univesitas Negeri Medan and become a routine agenda at Postgraduate program of Unimed now.

The AISTEEL is realized this year with various presenters, lecturers, researchers and students from universities both in and out of Indonesia participating in, the seminar with theme "Educational Innovation in Globalization Practice".

The fifth AISTEEL presents 4 distinguished keynote speakers from Universitas Negeri Medan - Indonesia, Kyoto University - Japan, Murdoch University – Australia, Prince of Songkla University – Thailand and from The University of Tokyo - Japan. In addition, presenters of parallel sessions come from various Government and Private Universities, Institutions, Academy, and Schools. Some of them are those who have sat and will sit in the oral defence examination. The plenary speakers have been present topics covering multi disciplines. They have contributed many inspiring inputs on current trending educational research topics all over the world. The expectation is that all potential lecturers and students have shared their research findings for improving their teaching process and quality, and leadership.

There are 180 articles submitted to committee, some of which are presented orally in parallel sessions, and others are presented through posters. The articles have been reviewed by double blind reviewer and 104 of them were accepted for published by Atlantis Press indexed by International Indexation, while 54 papers are published by digital library indexed by google scholar.

The Committees of AISTEEL invest great efforts in reviewing the papers submitted to the conference and organizing the sessions to enable the participants to gain maximum benefit.

Grateful thanks to all of members of The 5th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2020) for their outstanding contributions. Thanks also given to Atlantis Press for producing this volume.

The Editors

Bornok Sinaga
Rahmad Husein
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Development of Interactive Learning Media
Basketball Games in Subjects Physical and Sports Health Education

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Abstract—**This study aims to produce interactive multimedia learning media based on Adobe Flash basketball game material and its use in the Subjects of Physical Education Sports and Health, in Senior High School (SMA)/ Vocational High School (SMK). This research is a research and development which consists of; Define, Design, Development, and Dissemination. The subjects in this study included 10 (ten) teachers of Physical Education Sports and Health (PJOK), and 190 (eighty) grade XI students from 5 (five) SMA / SMK in Percut Sei Tuan District, Deli Serdang Regency. Data collection and analysis was carried out by collecting and reviewing the responses and validation results of Expert Judgment, small group testing, and product dissemination in large group testing of teachers and students in the development and use of instructional media. The results showed that interactive multimedia learning media based on Adobe Flash basketball game material was feasible to use, in small group testing of teachers and students the mean value per instrument was 4.56 and 4.46, while in teacher and student dissemination, the mean value per instrument was 4.68 and 4.39 with the criteria of "very good" and "good". This learning media makes it easier for students to understand the material and practice basketball game skills.**

Keywords—Interactive Multimedia, Learning Media Development, Basketball.

I. INTRODUCTION

The development of Information Technology (ICT) gave birth to a new era known as E-Life (Electronic Life), which is life that is influenced by electronic technology. The development of ICT has minimized geographical barriers, time and distance, as if the world is just a 'small village'. The development of ICT in education today has contributed to the advancement of the world of education to produce effective, efficient, innovative and fun learning models that make it easier for teachers to deliver learning materials.

The use of ICT in schools should be done to carry out the functions and objectives of national education. [1] The National Education System Law in Article 3 states that, National education functions to develop capabilities and form a dignified national character and civilization in the framework of educating the nation's life, aiming at developing the potential of students to become human beings who believe and fear God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become citizens who are democratic and responsible.

The advantages possessed by computer-based learning media show that the media has an important role in the process of achieving learning goals, for example sports. The difficulty in learning sports material is generally caused by the limited ability of the teacher to practice it, understand, and apply the concepts to be studied appropriately in everyday life.

Magribi stated that the main function of learning media is as a teaching aid that also influences the climate, conditions and learning environment that are arranged and created by the teacher. According to Sadiman, media is anything that can be used to transmit messages and senders to message recipients so as to stimulate thoughts, feelings, concerns and interests and attention of students in such a way that the learning process occurs. [2]

The benefits of using media according to Arsyad include; First, to clarify the presentation of messages and information so that it can expedite and improve learning processes and outcomes. Second, to increase and direct children's attention so that it can lead to learning motivation, more direct interaction between students and their environment and allows students to learn on their own according to their abilities and interests. [3]

Conventional learning in its delivery tends to be in the form of words, written or oral which makes it less attractive to students. According to Arief S. Sadiman, et al. the use of learning media can clarify the presentation of the material so as not to be verbalistic. [4]

Arsyad stated that the theory of using media in the teaching and learning process put forward by Dale's Cone of Experience states that the influence of media in learning can be seen from the level of learning experiences that will be accepted by students. Judging from the existing problems, it is necessary to develop a learning media as a tool for Physical Education teachers to deliver basketball game material so that the competence of the material can be achieved.

The learning revolution facilitated by Information and Communication Technology has had many positive impacts on the learning process. Information and Communication Technology makes the learning process of teachers and students not limited to space and time anymore, students can easily manage their own learning activities so that they are able to maximize the use of all learning resources facilitated by Information and Communication Technology so that they can master.

The use of instructional media by teachers in addition to learning activities can also be used by students for independent learning. This Learning Media will be in the form of a file that can be stored in various storage devices that can be reopened on any computer, such as; CD (Compact Disk), DVD (Digital Versatile Disk), Flashdisk, External Hardisk, Memory Card, or others, so that they can be used repeatedly and distributed to reach many people. This learning media is expected to be able to help students to learn independently and also increase understanding of the material presented therein. This media can be used as a form of development of learning media in the form of textbooks / handouts which can help facilitate the delivery of basketball game material.

One application program (software) that can be used to create learning media is Adobe Flash, also known as Adobe Animations, which has been launched by the Adobe Inc. company. [5] According to Andi and Syafi'i Adobe Flash is a software (application software) that is in great demand by most people because of its reliability that is able to do all things related to making cartoon films, advertising banners, web sites, presentations, games, and others. Adobe Flash can also be combined with other programs, for example graphics such as Photoshop, Corel Draw, Camtasia and so on. Adobe Flash can also be combined with programming languages, such as ASP, PHP, and other multimedia. The reliability of Adobe Flash compared to other programs is in terms of its small animation file size. In addition, the animation produced by the Adobe Flash program is also widely used to make a web appear more interactive.

Physical Education, Sports, and Health (PJOK) is essentially an educational process that utilizes physical activity to produce holistic changes in individual quality, both physically, mentally, and emotionally. PJOK as a subject is a medium to encourage physical growth, psychological development, motor skills, knowledge and reasoning, appreciation of values (attitudes-mental-emotional-sports-spiritual-social), as well as habituation of a healthy lifestyle that serves to stimulate growth and quality development. physical and psychological balance.

PJOK subjects in the 2013 curriculum structure are grouped into group B subjects, namely groups of subjects whose content is developed by the center and equipped with local wisdom content developed by local governments. The implementation pattern can be integrated with the basic competencies that are already included in the SMP / MTs / SMA / MA curriculum, or it can be formulated by adding separate basic competencies.

Basketball game is one of the subjects PJOK subject that is always available at every grade level, especially in SMA / SMK / MA and the equivalent. Based on the interviews conducted by the author with several PJOK teachers, it was obtained preliminary data that there were difficulties for PJOK teachers in teaching basketball game materials. According to observations, the difficulty of the teacher in learning basketball game material is due to the absence of learning media relevant to this material. The teacher's ability to understand the concept of basketball game theory is not accompanied by the ability to properly practice the basketball game material.

Based on the author's observations of the students while learning the basketball game material, information was obtained that students had difficulties in understanding this topic due to the lack and absence of examples of relevant learning media. Many students are interested in this basketball game material, but it is difficult to master the series of movements and basketball game techniques.

Learning Basketball Games requires students to carry out a series of movements through direct theory and practice taught by the teacher. Basketball game materials include; understanding, history, facilities and infrastructure, basic basketball game techniques, to attack and defense patterns and strategies. Less effective learning is seen when students only depend on teachers with conventional learning methods, causing students to experience difficulty in understanding the material presented. The results of the observations show the importance of developing a learning media that can overcome learning problems and support the achievement of learning objectives. The use of Adobe Flash in basketball game learning is expected to be able to solve the problems that have occurred so far.

The use of learning media in adobe flash-based basketball games allows a more conducive learning atmosphere, because students learn according to their ability and speed in understanding the knowledge and information presented. This learning media is expected to create an effective learning climate for students who are slow but can also spur learning effectiveness faster. Adobe flash can be programmed to be able to provide feedback on student learning outcomes and provide confirmation of student learning outcomes.

The number of problems that can arise from the topic of this problem, so with the limited time, cost, and difficulty in solving it in one study, the authors make the fundamental problems in this research, namely; Development of Interactive Multimedia Learning Media based on Adobe Flash in Physical Education Sports and Health Subjects.

II. THEORETICAL FRAMEWORK

A. Guided Discovery

There are several relevant studies related to the use of interactive learning media, namely:

First, Nurul Anggraeni's research entitled Development of Interactive Multimedia-Based Learning Media Using Adobe

Flash CS5 for Class XI Vocational High Schools Office Administration Skills Competency in Basic Competencies Describing Management Information Systems, Office Administration Education Study Program, Department of Administrative Education, Faculty of Economics, State University Yogyakarta in 2015. This development research aims to (1) develop interactive multimedia-based learning media for Class XI Office Administration Vocational High Schools in Basic Competencies of Describing Management Information Systems, (2) determine the assessment of media experts and material experts on learning media, (3) find out assessment of class XI Office Administration students on learning media, and (4) knowing the feasibility of learning media based on the assessment of media experts, material experts and students. The method used in this research is research and development (Research and Development). This research was conducted at SMK Batik Perbaik Purworejo. [6].

Second, [7] Hasby Maulidzana Al-Amin's research entitled Development of Multimedia-Based Learning Media Through Adobe Flash Player to Improve Learning Outcomes in Jurisprudence Subjects in Class VIII Madrasah Tsanawiyah Negeri Puncu Kab. Kediri, Islamic Education Study Program, Department of Islamic Religious Education, Faculty of Tarbiyah and Teacher Training, Maulana Malik Ibrahim State Islamic University Malang, 2015.

This research is an effort to develop learning media conducted by an educator and students by using the help of operational tools such as computers / laptops and projectors or LCDs. The development of this teaching media combines several components in the form of images, audio visuals, video, running text, animation (moving images), so that in this teaching media it does not seem very saturating both to the user and the viewer.

The purpose of developing this learning media is to improve learning outcomes in Jurisprudence. In this development, researchers used multimedia-based software, namely the Adobe Flash Player CS6 program. While the results of this development will be extracted using a CD (Compact Disc). In developing this interactive learning media, researchers used the Dick and Carey development method. The procedure for developing this teaching media should use ten steps, but only 9 steps are used in the study, including: (1) Identifying Intructional Goals (needs analysis), (2) Conducting Intructional Analysis (learning analysis), (3) Identifying Entry Behaviors , Characteristics (learner analysis and context), (4) Writing Performance Objectives (specific general objectives), (5) Developing Criterian-Referenced Test (developing instruments), (6) Developing Intructional Strategy (developing learning strategies), (7) Developing and Selecting Intruction (developing and selecting learning materials), (8) Designing and Conducting Formative Evaluation (designing and conducting formative evaluations), and (9) Revising Intruction (making revisions).

The results of the exposure to data analysis show that the comparison value between the experimental class and the control class is very significant. This is shown through the trial of developing interactive teaching media that students have increased understanding of the material so that they can improve learning outcomes in the Jurisprudence subject. The results of field trials between the control class and the experimental class get a significant difference. The average gain for the control class was 80.27, while the results for the experimental class were 93.02. This shows that there is a comparison of the average yield of the two classes which reaches 12.75 after using the results of the interactive teaching media development program.

Third, [8] research by Agung Dwi Setiawan entitled Development of Learning Multimedia for Physical Education, Sports and Health Based on Adobe Flash CS3 Professional for Class VII Junior High Schools, Health and Recreation Physical Education Study Program, Department of Sports Education, Faculty of Sport Sciences, State University Yogyakarta in 2015. This research is motivated by the limited knowledge of teachers and the development of multimedia learning for seventh grade junior high school students in the material of pencak silat martial arts. This study aims to produce a multimedia product for learning Pencak Silat in PJOK subjects based on Adobe Flash CS3 Professional for grade VII junior high school.

This type of research is research and development, development carried out through the following stages: introduction, development of learning designs, developing initial products, and product evaluation. After going through the production stage, an initial product is produced which is validated by material experts and media experts. Furthermore, the product is tested on students through stages, small group trials. The subject of the product trial was 15 students of class VII State Junior High School 1 Sewon. Data were collected through a questionnaire. Data in the form of research results regarding product quality, suggestions for product improvement. Qualitative data were analyzed using descriptive statistics.

The results of this research are multimedia learning that has been tested, produced multimedia products for learning physical education, sports and health, the material for martial arts using Adobe Flash CS3 Professional software for grade VII which is stored in the form of a Compact Dist (CD). The results of the validation were carried out by material experts stated as "Very Good" with a mean score of 4.32 and media experts rated "Good" with a mean score of 4.14. The assessment of students on the main media trial was "Very Good" with a mean score of 4.52. So it can be concluded that the product developed is suitable for use in the learning process.

Fourth, [9] Tri Apriyani Research entitled Development of Interactive Learning Media Adobe Flash CS5 To Improve Short Text Reading Skills in Class XI Students of El Shadai Magelang High School, French Language Study Program, French Language Education Department, Faculty of Languages and Arts, State University Yogyakarta in 2015. This research aims to: (1) produce interactive learning media Adobe Flash CS5. (2) to determine the feasibility level of interactive learning media Adobe Flash CS5 to improve

reading skills of short French texts with the theme La Vie Quotidienne.

This type of research is Research and Development (R & D) through 8 stages of development, namely: (1) observation and information gathering which includes: field observation, literature study, material analysis, and concepts; (2) planning, including: determining learning objectives, initial media design and instrument design; (3) product draft development: (4) product stabilization; (5) product assessment and product validation by material experts and media experts. The instrument used to assess the quality of learning media was a questionnaire given to teachers and students to find out their opinions about learning media. The pre-test and post-test questions were used as supporting data.

The results of this study are interactive learning media Adobe Flash CS5 to improve the reading skills of French short text students of class XI SMA El Shadai Magelang. The quality of this learning media is determined by: 1) the feasibility aspect of the content of the material based on the assessment of the material expert by the UNY lecturer and the assessment of the French teacher with a very valid result category, 2) the assessment of the media expert, 3) the student's response to the learning aspect. Based on these results, it shows that the Adobe Flash CS5 learning media is suitable for use in learning French for reading skills.

Fifth, Ibnu Diki Pratama's Research entitled Development of Learning Multimedia Based on Adobe Flash Football Game Course for PJKR FIK UNY Students, Health and Recreation Physical Education Study Program, Department of Sports Education, Faculty of Sport Sciences, Yogyakarta State University in 2015 This research as an effort to create diverse learning resources can be an alternative learning for students, so it does not only rely on learning resources from books and lecturers. [10].

This study aims to make multimedia learning based on Adobe Flash for soccer game courses for PJKR FIK UNY students. The process of multimedia development has gone through several stages. Preliminary stages, learning design development, production, and product evaluation. The preliminary stage is determining courses, identifying needs, then determining the material to be included in the multimedia learning product. The second stage is developing learning designs by identifying competency standards and basic competencies, identifying student behavior and characteristics, developing materials, developing test items and learning strategies, then preparing evaluations. Furthermore, the production stage, namely, making flow charts, compiling a script, collecting materials to be included in multimedia learning, then continuing the process of developing multimedia learning in soccer game subjects. The process of developing this learning multimedia also includes making the application and the process of making learning videos for basic football skills. The last stage, namely, the evaluation or validation process by material experts, media experts and students (one on one trial). Then in the end, the final product was produced in the form of multimedia learning for soccer game courses for PJKR FIK UNY students.

This research produced an Adobe Flash-based multimedia learning product for soccer game subjects that can be used by students as a companion material in soccer game subjects. The validation of material experts and media experts showed "very good" results, while the assessment in the one on one trial was obtained: the display aspect of the score was 3.91 (good), the aspect of the content was 4.21 (very good), the aspect of learning the score was 4.22 (very good). The overall mean in the one-on-one trials was 4.11 including the "good" criteria.

B. Development of Interactive Multimedia in Learning

Many experts provide definitions of multimedia learning. Barker & Tucker (in Soenarto), multimedia is defined as a collection of various different media tools used for presentations. Multimedia in this sense is defined as the variety of media used for the presentation of subject matter, for example the use of wall charts or graphs made on cardboard pasted to the wall. [11]

Multimedia learning is generally considered part of E-Learning, which is a learning medium that combines several media such as; audio, video, animation, and images. [12] Tan Seng Chee and Angela Wong stated that multimedia traditionally refers to the use of several media, while multimedia today refers to the combined use of several media in presenting learning through computers.

Multimedia is actually a term for a medium that combines various kinds of media both for learning purposes and not. This diversity of media includes text, audio, animation, video, and even simulation. According to Turban (in Setiawan) defines multimedia is defined as a combination of at least two input or output media of data, this media can be in the form of audio (sound, music), animation, video, text, graphics and images. [13] The characteristics of multimedia learning are described by Daryanto as follows:

1) Having more than one convergent media, for example combining audio and visual elements.
2) Interactive, in the sense that it has the ability to accommodate user responses.
3) Independent, in the sense of providing convenience and completeness of content in such a way that users can use it without the *guidance of others*.

Based on some of the explanations above, it can be concluded that multimedia is a tool for delivering learning material that is presented by combining two or more components of dynamic text, graphics, animation, audio, and / or video in order to create interactions between students, teachers and the multimedia.

III. RESEARCH QUESTION

The objectives to be achieved from this research are:

1. To produce learning media for Basketball Games based on Adobe Flash in the Subject of Physical Education for Health Sports in SMA / SMK / MA and Equals.

2. To find out how to use learning media for basketball games based on Adobe Flash in the Subject of Physical Education for Health Sports in SMA / SMK / MA and equivalent.

IV. METHOD

The method used in this research is research and development. In the research and development method there are several types of models. [14] The model used is a 4-D model development. The 4-D (Four D) development model is a learning device development model. This model was developed by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel.

The 4-D development model consists of 4 main stages, namely: Define, Design, Develop and Disseminate. This method and model was chosen because it aims to produce a product in the form of interactive learning media for basketball games based on Adobe Flash. The product developed is then tested for its feasibility with validity and product testing to determine the extent to which the increase in learning motivation and learning outcomes of students after learning uses interactive learning media for basketball games in PJOK lessons.

The determination of the subject in this study was carried out purposively. There are two types of participants who will be asked for their opinions regarding the development and use of learning media for basketball games based on Adobe Flash in PJOK Subjects, namely 10 (ten) teachers, and 190 (one hundred and ninety) grade XI students from 5 (five) SMA / SMK in Percut Sei Tuan District, Deli Serdang Regency. Researchers will see the process of using interactive multimedia learning media based on Adobe Flash in the PJOK Subject for Basketball Game Material, while in student researchers will see how students respond after the teacher presents the material using the learning media.

V. RESULT AND DISCUSSION

A. Data Analysis

The data analysis technique used in research is the process of systematically searching and compiling data obtained from interviews, field notes and other materials, so that they can be easily understood, and their findings can be shared with others. [15] Sugiyono stated that data analysis is carried out by organizing data, describing it into units, synthesizing, arranging into patterns, choosing which ones are important and what will be studied, and making conclusions that can be shared with others.

In research trials, the data is classified into two, namely qualitative data and quantitative data. Qualitative data in the form of criticisms and suggestions put forward by material experts, media experts, and students were collected to improve this interactive multimedia-based learning media product. [16] According Widoyoko the quantitative data obtained from the

questionnaire were then converted to qualitative data on the Benchmark Reference Approach (PAP) developed with a scale of 5 (Likert scale) to determine product quality with the following description:

- Very Poor (SK) given a score of 1
- Less (K) is given a score of 2
- Good Enough (CB) is given a score of 3
- Good (B) is given a score of 4
- Very Good (SB) was given a score of 5

1) Material Expert Validation Data. The data obtained by providing the initial product of the development of multimedia learning is accompanied by a questionnaire sheet for material experts which contains aspects of the quality of learning material and content. The material expert gave an assessment through the questionnaire. In addition, material experts provide input, criticism and suggestions which are also noted by researchers. Input, criticism and suggestions are useful for improving the quality of multimedia learning that is being developed. Not to forget, the researchers reconfirmed the criticisms and suggestions that had been recorded to the material experts so that they were not mistaken.

The final criteria for the quality aspect of the learning material above obtained from the conversion of data from quantitative data to qualitative data on a scale of five are as follows:

TABLE 1. ASSESSMENT CRITERIA RESULTS

No	Criteria	Score	
		Formula	Calculation
1.	Very good	$X > Xi + 1,80 \ Sbi$	$X > 4, 21$
2.	Well	$Xi + 0,60 \ Sbi < X \le Xi = 1,80 \ Sbi$	$3,40 < X < 4,21$
3.	Pretty good	$Xi - 0,60 \ Sbi < X \le Xi = 0,60 \ Sbi$	$2,60 < X < 3,40$
4.	Not good	$Xi - 1,80 \ Sbi < X \le Xi - 1,80 \ Sbi$	$1,79 < X < 2,60$
5.	Very Poor	$X \le Xi - 1,80 \ Sbi$	$X < 1,79$

Average ideal score (Xi): ½ (Maximum ideal score + minimum ideal score).

Ideal standard deviation (Sbi): 1/6 ideal maximum score - ideal minimum score).

X = Actual Score

Based on the conversion score formula above, to convert the quantitative data obtained into qualitative data the conversion is applied as follows:

Known: Maximum score = 5, minimum score = 1

Xi = ½ (ideal maximum score + ideal minimum score)   (1)

Xi = ½ (5 + 1) = 3

SBI = 1/6 (maximum ideal score - ideal minimum score) (2)

Sbi = 1/6 (5-1) = 0.67

From this provision the criteria score intervals are obtained as in the following table:

TABLE II. RESULTS OF CONVERSION OF QUANTITATIVE DATA INTO QUALITATIVE DATA

Score Interval	Criteria
X > 4, 21	Very good
3,40 < X < 4,21	Well
2,60 < X < 3,40	Pretty good
1,79 < X < 2,60	Not good
X < 1,79	Very Poor

Evaluation from material experts is carried out in 2 stages. The form of description of the data obtained from material experts is as follows.

B. Result

The results of the assessment obtained from material experts, media experts, teacher and student assessments during this study include:

TABLE III. RESULT OF MATERIAL EXPERT ASSESSMENT

Aspect	Total score	Average	Criteria
Score of Quality Aspects of Learning Materials from Material Experts Stage I	44	3,66	Well
Score of Content Aspects of Phase I Material Experts	44	3,66	Well
Score of Quality Aspects of Learning Materials from Material Experts Phase II	55	4.58	Very good
Score of Content Aspects of Phase II Material Experts	56	4.30	Very good

2) Media Expert Validation Data. Data from media experts were obtained through a given questionnaire. The contents of the questionnaire included an assessment of aspects of the display, aspects of programming, and aspects of the correctness of the display and programming. Filling in the questionnaire is followed by media experts trying out the research product that is being developed.

Evaluation from media experts was carried out in 2 stages. The form of description of the data obtained from media experts is as follows:

TABLE IV. MEDIA EXPERT ASSESSMENT RESULTS

Aspect	Total score	Average	Criteria
Score of Display Aspects of Stage I Media Experts	61	3.4	Well
Programming Aspect Score from Stage I Media Expert	22	3.6	Well
Score of Display Aspects of Stage II Media Experts	89	4.23	Very good
Score of Programming Aspects of Phase II Media Experts	30	4.28	Very good

The assessment given by material experts and media experts is getting better after the parts that are recommended for revision in stage I have been implemented properly. Then in stage II the material and media experts gave conclusions to this learning multimedia, namely, it was feasible to use trials without revisions.

3) Trial Data on Teachers and Students. After going through the validation stage from material experts and media experts, then the next stage is the trial phase. One by one the researchers went to the respondent, then showed this multimedia product, then the respondent tried the product, after which the respondent gave an assessment and entered it. Respondents in this trial were 10 PJOK teachers and 190 students who were taken purposively.

The following data were obtained during the trial implementation of PJOK teachers and students:

TABLE V. DISPLAY ASPECT ASSESSMENT

No	Rated Aspect	Towards Teacher		Towards Students	
		Average Score	Criteria	Average Score	Criteria
1.	The writing is clearly legible	4.3	Very good	4.0	Well
2.	Clarity of instructions for use	3.9	Well	4.3	Very good
3.	Ease of selecting the menu	3.9	Well	4.0	Well
4.	Ease of using buttons	4.0	Well	4.3	Very good
5.	Clarity of button function	4.0	Well	4.0	Well
6.	Music sounds support	3.8	Well	3.9	Well
7.	Video image clarity	4.0	Well	4.2	Well
8.	Video sound clarity	4.0	Well	4.2	Well
9.	Image color clarity	4.1	Well	4.3	Very good
10.	Animated triumph	3.8	Well	4.0	Well
	The mean number of scores	39.8	Well	41.2	Very good
	Total mean score	3.98		4.12	

TABLE VI. CONTENT / MATERIAL ASPECT SCORE

No	Rated Aspect	Towards Teacher		Towards Students	
		Average Score	Criteria	Average Score	Criteria
1.	Clarity of material	4.6	Very good	4.5	Very good
2.	Language clarity	4.2	Well	4.1	Well
3.	Video clarifies the material	4.6	Very good	4.5	Very good
4.	Images clarify the material	4.4	Very good	4.5	Very good
5.	Clarity of question formulation	4.0	Well	4.0	Well
6.	Difficulty level problems	4.0	Well	4.0	Well
	The mean number of scores	25.8	Very good	25.6	Very good
	Total mean score	4.3		4,27	

TABLE VII. LEARNING ASPECT SCORE

No	Rated Aspect	Towards Teacher		Towards Students	
		Average Score	Criteria	Average Score	Criteria
1.	Challenging / interesting material	4.0	Baik	4.0	Baik
2.	Ease of choosing material	4.0	Baik	4.0	Baik
3.	Clarity of study instructions	4.3	Sangat Baik	4.2	Sangat Baik
4.	Clarity of instructions for doing questions	4.1	Baik	4.2	Sangat Baik
5.	Suitability of the matter with the material	4.4	Sangat Baik	4.3	Sangat Baik
6.	With multimedia learning is more interesting	4.6	Sangat Baik	4.5	Sangat Baik
7.	Multimedia helps learning	4.6	Sangat Baik	4.5	Sangat Baik
	The mean number of scores	30.0	Sangat Baik	29.7	Sangat Baik
	Total mean score	4,28		4,24	

C. Discussion

The development of basketball learning media based on Adobe Flash is made using Adobe Flash CS6 software. Making is done through several stages and testing, among others; Validation by Expert Judgment is validation of material experts, validation of media experts, then a small group test is conducted by the teacher and students, at the end (dissemination) conducted in large groups by the teacher and students. This series of stages is carried out to complete the improvement of learning media so that it is useful and appropriate for its users.

The process of validating material experts has two stages of validation. Phase I validation is an assessment of the initial multimedia learning product. The assessment of the material expert validation stage I was used as a basis for improvement to be validated again in stage II, so that the product was ready for testing. After validating the material experts, then proceed to the validation process for media experts. In the validation process by media experts, suggestions and comments are obtained which are used as material for improving this learning multimedia. The validation process by media experts also goes through two stages, namely stage I and stage II validation. In the data validation, stage I media experts are used as material for improvement in stage II validation, until the product is ready to be tested on teachers and students. Media experts say multimedia learning is appropriate for use without revision, so the next step is to test the teacher and students. In this one-on-one trial phase, suggestions and input from teachers and students are also obtained which are used to make stage II revisions. This stage II revision has been completed, resulting in a final product that is ready for use by teachers and students for independent study.

The results of the final assessment of the dissemination of large groups of teachers and students concluded that the interactive learning media for basketball games based on

Adobe Flash among the teachers received the criteria of "Very Good" and among the students the criteria were "Good" which means that it was feasible to use. The students gave a positive response to the application that was presented. The students said that the interactive learning media application for basketball games based on Adobe Flash made it easier for them to understand the theory, and helped them practice basketball. This fact has also strengthened several previous studies.

Based on the results of an Expert Judgment assessment which are media experts and material experts, teachers and students in small and large group testing, obtained several advantages in this interactive learning media basketball game based on Adobe Flash. [17] This advantage is because this learning media meets the criteria for aspects of the assessment of interactive multimedia described by Walker Hess (in Arsyad, 2011) such as; quality of material and objectives, quality of learning, and quality of techniques.

The development of interactive learning media for basketball games has several limitations in research and development, namely:

- Basketball learning media based on Adobe Flash in appearance does not contain slow motion videos, this is because the videos in this learning media can be repeated.

- Some videos are made and taken using a cellphone camera, ideally videos are made and taken using a professional camera with high resolution.

- For High Destinity video quality, researchers took several videos via youtube.com while still including the source in the application reference.

- Dissemination of interactive learning media for basketball games based on Adobe Flash is still limited to 5 (five) SMA / SMK in Percut Sei Tuan District, Deli Serdang Regency, this is due to limited time and money.

- Testing of interactive learning media for basketball games is carried out among limited students of SMA / SMK class XI who are considered to be middle class, so that no generalizations can be made about its effectiveness in the learning process at all levels.

VI. CONCLUSION

Based on the results of research and development of Adobe Flash based basketball game multimedia products, it can be concluded as follows:

- Development of interactive learning media for basketball games based on Adobe Flash in PJOK Subjects has been successfully implemented using a 4-D development model with appropriate criteria for use, the output is in the form of learning media files that have passed the stages of validation, testing, until disseminated to teachers and students.
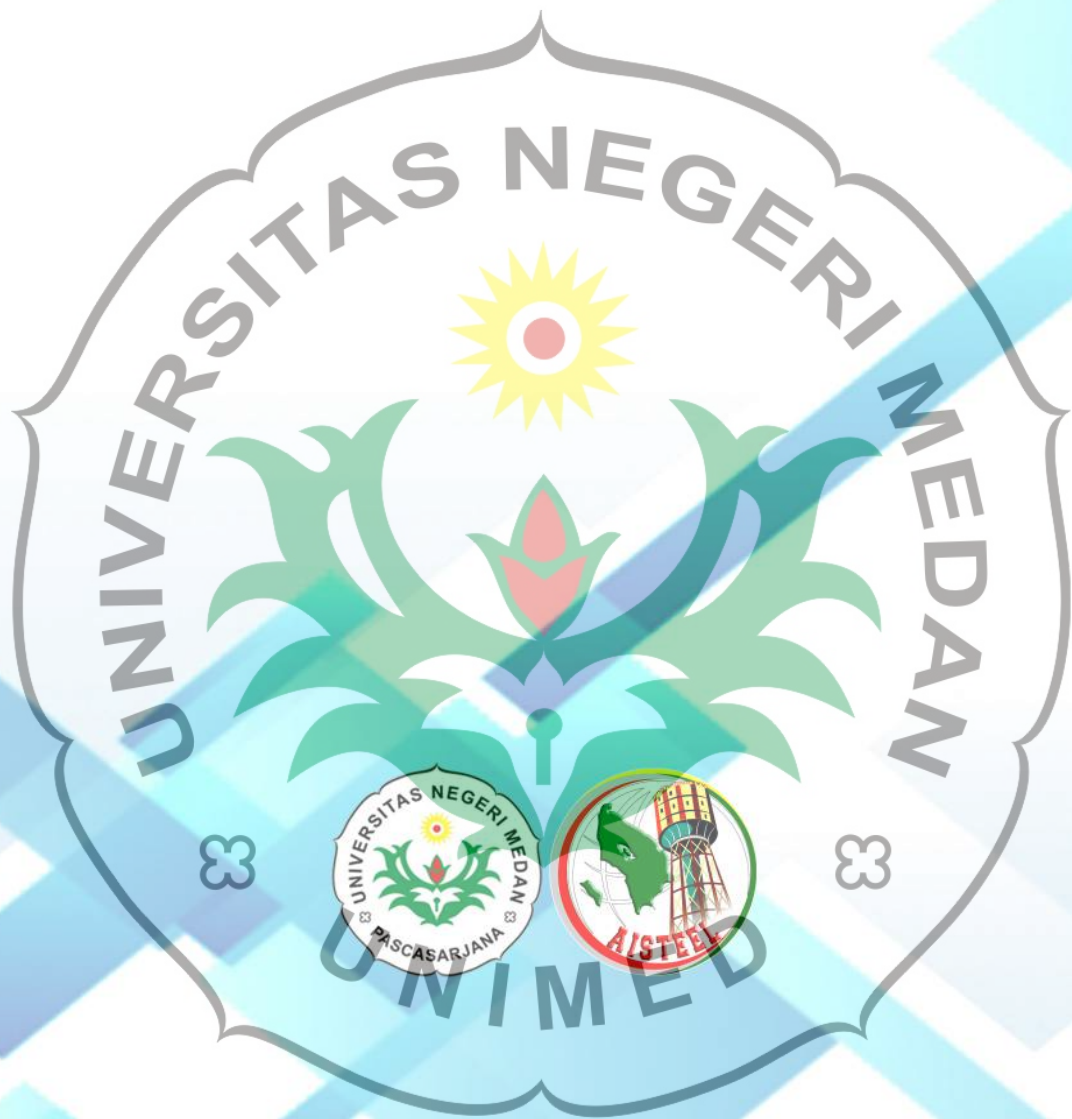
- Observers during learning and interviews with PJOK teachers concluded that the use of interactive learning media for basketball games based on Adobe Flash before practice made it easier for students to understand the material and practice basketball game skills.

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