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Learning media development physical education sport and health that number athletic material based on Android application

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Abstract

This study aims to (1) produce development products for physical education sport and health learning media based on android applications on the athletic material of throwing numbers for high school students, (2) to find out the feasibility of developing learning media products for physical education sport and health learning media based on android applications on throwing number athletic materials for high school students and (3) determine the level of effectiveness of the development of learning media products for physical education sport and health based on android applications on athletics throwing numbers for high school students.

This research and development are carried out in ten stages which refer to the steps developed by Borg & Gall, which include: (1) Research and information gathering, (2) Planning, (3) Initial product development, (4) Improvement of the initial design, (5) Formation of trial products, (6) Small group trials, (7) Revision of small group trial products, (8) Field trials, (9) Revision of field trial products, (10) Dissemination or dissemination. The subjects of the small group trial were 21 students of class XI SMA N 5 Yogyakarta, the subjects of the field trials were 112 students of class XI SMA N 8 Yogyakarta, the product trials included material expert trials, media experts, and small group trials and field trials. by students. Data obtained through observation, questionnaires, interviews, and learning outcomes tests. Data analysis used a t-test with a significance level of 0.05. Based on the results of the pretest and posttest that have been obtained, then the effectiveness test was carried out using the paired sample t-test using the SPSS program. 16 For Windows.

The results of the research of the pretest and posttest data on the field test showed that the learning media had a significant effect on improving student or respondent achievement. The effectiveness of learning media can be seen in the descriptions of the results of the pretest and posttest on respondents or students of SMA N 8 Yogyakarta as follows. At the pretest the lowest score got a score of 33.00, then the highest score got a score of 100.00. The average number of values on the pretest reached 79.91, and if all the respondents' scores on the pretest were added up to reach a value of 8951.00. After being treated with the application of learning media, the lowest score in the posttest increased to 37.00 and the highest score reached a maximum score of 100.00. The average overall score on the posttest increased to 86.62, and the total score at the posttest reached a score of 9702.00.

Thus, it can be concluded that the instructional media products of physical education sport and health, athletic number throwing materials based on android applications can be used by students and teachers as a medium in the teaching and learning process.

Keywords: learning media, athletics throwing numbers, android applications

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Introduction

The teaching and learning process must always adjust to technological and scientific developments (Dewi K, 2017). The use of media in the learning process is a forum for technology to boost the achievement of learning objectives (Ananda, 2017). With the existence of media, technology can have a role in the teaching and learning process (Geng et al., 2019). For example, if students want to read books related to learning at school these students do not have to go outside the house and look for books in the library because now there are many textbooks available online and can be accessed anywhere using the student's gadget, laptop, computer, or smartphone (Raja & Nagasubramani, 2018).

With the development of learning media in the current era of globalization, students are greatly helped by the presence of smartphones which can make it easier for students to search for material (Sudarsana et al., 2019). Thus, the development of learning media must also adapt to current technological developments. Technology can be turned into learning media and can optimize the learning process (Kim, 2020). Learning media is a form of physical equipment that can be hardware and software (Saidin et al., 2015). The shift in learning media from traditional to modern is none other than to support the learning process to achieve goals (Kara & Sevim, 2020). Even so, there are still obstacles that become homework for both teachers and students (König et al., 2020). These constraints are of course related to the demands for the achievement of the three main areas that must be achieved. The three main areas that must be reached among other factors are the affective domain, the cognitive domain, and the psychomotor domain (Faizah, 2020). This includes learning about physical education in sports and health in schools.

Athletic material is one part of the material that must be taught in physical education sport and health considering that it has been included in the high school syllabus, both in grade ten to grade twelve (Watkins & Gonzenbach, 2013). Even so, athletic material seems to have received the title of a stepchild at school. Compared to other materials, athletic materials are still less popular than other physical education sport and health materials, for example, soccer, basketball, volleyball, and also other popular sports at school (Lopes Sauers et al., 2017). When viewed from its history, athletics is the parent of all sports today. Associated with the lack of infrastructure for athletics material ten tun yes become an obstacle in the learning process by both the teachers and the students (Kamusoko & Pemberton, 2013). In the teaching and learning process, students will certainly be greatly helped if they can use real athletic facilities, but not all students can feel the expected things (Gallucci & Petersen, 2017).

Regarding the relationship between physical education sport and health learning and the three domains of patents, namely affective, cognitive, and psychomotor (Smith, 2016). Then through games created by creative teachers and also simple competitions related to athletic material in schools, it is certainly very helpful in achieving three focused domains (Sönmez, 2017). However, this matter is slightly left out in the cognitive realm because students are more interested in doing the techniques taught and modified by the teacher with simplified tools and regulations (Lu et al., 2016). Related to this, very basic theories such as regulations, field sizes, and standard tools on athletic material are displaced a little, even not being noticed by students (Lacy & Williams, 2018).

Along with the practice of students in schools that use rules and equipment modified by the teacher, students will also get a basic knowledge of the athletic material of throwing numbers through the learning media that will be developed by researchers, so that the three-domain goals will be maximally achieved (Parker et al., 2018). In this study,

the learning media to be developed is to use an application that is included in a smartphone-based on the Android operating system (Noorhidawati et al., 2015).

The advantages of Android compared to other operating systems include: (1) Android is an open platform. Everyone has the right to own or download a software development kit and create applications for the Android operating system. That is why many free android applications can be downloaded on the Playstore; (2) Android has a good reputation because Android gets full support from Google. Google is a company that already has a good reputation. Google has successfully created software such as Gmail, search engine, google chrome browser, and so on; (3) Android has opensource access with Apache license. The open-source code and apache licensing license allow anyone to have the freedom to modify, distribute, and develop freely.

The data previously described shows that compared to other operating systems, the Android application system has the greatest opportunity from using learning media applications that can be modified into learning media and entered on smartphones. The hope is that by entering athletic material on smartphones, students can easily access and search for information related to physical education sport and health learning on athletic material for throwing numbers.

Based on the various statements above, the writer wants to develop physical education learning media based on Android applications, especially in athletic material for throwing numbers which can be accessed later via smartphones owned by high school students.

Methods

This research and development are carried out in ten stages which refer to the steps developed by Borg & Gall, which include: (1) Research and information gathering, (2) Planning, (3) Initial product development, (4) Improvement of the initial design, (5) Formation of trial products, (6) Small group trials, (7) Revision of small group trial products, (8) Field trials, (9) Revision of field trial products, (10) Dissemination or dissemination. The subjects of the small group trial were 21 students of class XI SMA N 5 Yogyakarta, the subjects of the field trials were 112 students of class XI SMA N 8 Yogyakarta, the product trials included material expert trials, media experts, and small group trials and field trials. by students. Data obtained through observation, questionnaires, interviews, and learning outcomes tests. Data analysis used a t-test with a significance level of 0.05. Based on the results of the pretest and posttest that have been obtained, then the effectiveness test was carried out using the paired-sample t-test using the SPSS program 16 For Windows.

Results and Discussion

1. The results of the test of students' learning effectivity, efficiency, and motivation to learning media products Physical Education Sport and Health material athletic throw numbers based on Android applications

The purpose of the pretest and posttest in this study was to compare the results of the tests given to students from before being given treatment to after being given treatment. Also,

the pretest and posttest are useful for concluding whether the application is effective in improving student learning achievement.

The pretest and posttest questions consisted of 30 items. The treatment will be given between the pretest and posttest. The comparison of the results between the pretest and posttest will go through the t-test stage with the help of the SPSS measurement application. Pretest and posttest were given to students through two stages, namely small group trials given to students of SMA N 5 Yogyakarta and field trials given to students of SMA N 8 Yogyakarta.

a. Pretest and Posttest Values in Small Group Trials

Table 1: Comparison Results Score Earned Value pretest with posttest on Trial Small Group by students SMA N 5 Yogyakarta

Mean	62,1429	62,5238
Std. Error of Mean	3,76973	3,25914
Median	76,00	67,00
Std. Deviation	17,27509	14,93526
Variance	298,429	223,062
Minimum	17,00	23,00
Maximum	93,00	90,00
Sum	1305,00	1313,00

Source: primary data processed

Based on the table above, it can be noted that the level of ability of students before and after using the learning media for athletic material throwing numbers in small group trials at SMA N 5 Yogyakarta totaling 21 students. The comparison between the two students' scores before and after being given treatment did not appear to have increased significantly in value. The lowest posttest score was 17.00 and the lowest posttest score was 23.00, while the highest score in the pretest was 93.00 and the highest score on the posttest was 90.00 or had a slight decrease. The total value between the pretest and posttest was also not much different or only slightly increased, namely 1305.00 for the pretest and 1313.00 for the posttest. The average value of the pretest was 62.1429 and the posttest was 62.5238.

Table 2: T-Test Acquisition Value pretest with posttest on Trial Small Group by students SMA N 5 Yogyakarta

Sig. *(2-tailed)*	**α**	**df**	**t-count**	**t-table**
0,878	0,050	20	-0,156	-2,085
Sig. value (2-tailed)> α		t-count < t-table		
Not significant				

Source: primary data processed

Based on the t-test in the small group trial, the sig value was obtained. (2-tailed) of 0.878 and t-count of -0.156, and t-table of -2.085. Referring to the 5% significance level, Sig. (2-tailed) 0.878> 0.050 and t-count -0.156 <-2.085, it can be concluded that there is no significant increase or can not be said to be effective in improving student test results after being treated with physical education sport and health learning media for Android-based athletic material. Therefore, researchers need to review the causes of the insignificant test results.

b. Pretest and Posttest Values in Field Trials

Table 3: Comparison Results of the Acquisition Scores of Pretest and Posttest Values in Field Trials by Students of SMA N 8 Yogyakarta

Mean	79,9196	86,6250
Std. Error of Mean	1,33095	1,25068
Median	67,00	63,00
Std. Deviation	14,08541	13,23599
Variance	198,399	175,191
Minimum	33,00	37,00
Maximum	100,00	100,00
Sum	8951,00	9702,00

Source: primary data processed

The table above is the results of the pretest and posttest in the field trials given to 112 students of SMA N 8 Yogyakarta. Based on the table above, it can be seen the comparison between the pretest and posttest results. There was an increase in the average score after being given the treatment of instructional media, namely from 79.9196 to 86.6250 with the lowest score at pretest 33.00 and posttest 37.00. Then at the highest score, both the pretest and posttest get a value of 100.00. The difference in results is also found in the sum of the pretest score of 8951.00 and the posttest score of 9702.00. From the overall score that has been described, it can be concluded that there is a fairly good increase from the students after using the instructional media physical education sport and health, athletic number throwing material based on android.

Table 4. T-Test Table of Acquisition of Pretest and Posttest Values in Field Trials by Students of SMA N 8 Yogyakarta

Sig. *(2-tailed)*	**α**	**Df**	**t-count**	**t-table**
0.000	0.050	111	-6.764	-1.981
Sig.Value (2-tailed)<α		t-count > t-table		
Significant				

Source: primary data processed

Based on the t-test in the small group trial, it got a sig value. (2-tailed) of 0,000 and t-count of -6,764 and t-table of -1,981. Referring to the 5% significance level, Sig. (2-tailed) 0,000 <0,050 and t-count -6,764> -1,981. so it can be said that there has been a significant increase. Based on the t-test that has been carried out in the field test, it can be concluded that the learning media for Android-based athletic materials for throwing numbers are very effective in improving student achievement.

c. The Efficiency of Learning Media Products Physical Education Sport and Health Athletic Material Throw Number Based on Android Applications

The product efficiency from the observation results can be obtained from the data which are listed in the following table:

Table 5: Observation Results Regarding Efficiency Aspects of Learning Media Products Physical Education Sport and Health Athletic Material Throwing Numbers based on Android Applications

No	Indicator	Note
1.	Assistance in teaching with learning media	The media can help students understand the athletic material of throwing numbers. In this case, it also shows that learning media can be a tool for teachers to provide material to students, especially in pandemic conditions like this. Conditions that must require teachers to be able to provide material even without face to face with students.
2.	Independent learning resources	Students can find learning material in the learning media independently without the need for assistance from the teacher, or it can be said that with the results of the posttest that has been done it can be concluded that students can understand the material without the need for an explanation from the teacher first.
3.	Learning flexibility	Android-based learning media creates flexibility in learning and looking for the material. Learning media also make it easier for students to access the exercises in the application during school hours or outside class hours.

Source: Observations during the implementation of the research

d. Learning Motivation in Using Learning Media Products Physical Education Sport and Health Athletic Material Throw Number Based on Android Applications

Table 6: Observation Results Regarding Aspects of Learning Motivation in the use of Learning Media Products physical education sport and health, Athletic Material Throwing Numbers, Based on Android Applications

No	Indicator	Note
1.	Interested in trying and using on your initiative.	The implementation of research conducted online creates a limited amount of interaction between researchers and students. However, during the research, it turned out that this did not become an obstacle for students to continue downloading applications used in athletic learning. Most students immediately download the application when they get the download link provided by the researcher. This can also be seen by researchers from the notes or comments written by students in the research questionnaire.
2.	The seriousness of learning without involving the teacher	During the research, the teacher only facilitates group discussions between researchers and students. During that time, students also did not get special instructions given by the teacher to students related to athletic learning material for throwing numbers. The results of field trials also showed that there was a significant increase in student understanding while using learning media. So it can be concluded that students are serious in studying the athletic material of throwing numbers contained in the learning media.

Source: Observations during the implementation of the research.

To find out students' learning motivation in using physical education sport and health learning media, athletic number throwing material based on the Android application which was tested there were several indicators used by researchers, these indicators included, interested in trying and using with their initiative and the seriousness of students in studying the material without coercion from the teacher.

Conclusion

The results of the research of the pretest and posttest data on the field test showed that the learning media had a significant effect on improving student or respondent achievement. The effectiveness of learning media can be seen in the descriptions of the results of the pretest and posttest on respondents or students of SMA N 8 Yogyakarta as follows. At the pretest the lowest score got a score of 33.00, then the highest score got a score of 100.00. The average number of values on the pretest reached 79.91, and if all the respondents'

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Thus, it can be concluded that the instructional media products of physical education sport and health, athletic number throwing materials based on android applications can be used by students and teachers as a medium in the teaching and learning process.

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