Development of Android-Based Swimming Learning Media Mobile Learning Applications in Basic Swimming Lectures at Universitas Nahdlatul Ulama Blitar

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Abstract
Mobile learning is widely used because of its ease that can be accessed anytime and anywhere, especially by students who have mobile devices such as smartphones, phablets or tablets. This research aims to develop Android-Based Swimming Learning Media Mobile Learning Applications in Basic Swimming Lectures at Universitas Nahdlatul Ulama Blitar. Research and Development is the method used by researchers (Adapted from Dick and Carey). The data was validated by 2 experts: media experts and swimming learning experts. Furthermore, a small group trial of 6 students was carried out, while 34 students were the subjects of the Large-Scale Trial. The results obtained are: Product clarity criteria acquired a percentage of 94.49% is extremely valid, attractiveness criteria are 92.40% very valid, Understanding Criteria 95.96% are very valid, and usefulness criteria 89.58% are very valid. All criteria have already met the feasibility of the product so that the development of android-based swimming learning media mobile learning applications in basic swimming lectures is declared very valid and feasible to be used as a medium to maximize the learning process.

Keywords: android app, mobile learning, swimming learning

Introduction
Swimming is one of the water sports that moves all limbs or bodies, both arms, legs, and head movements. Swimming is a sport that has minimal risk of injury and can maintain health. In addition, swimming is the most recommended sport, swimming itself has many benefits if done correctly and precisely. According to Nohantiya. P.(2020) (1) Swimming is a sport performed in water consisting of four styles, namely: front crawl, Breaststroke, backstroke, and butterfly as an effort to nourish the body and refresh the soul. One of the required subjects in Sports Education study program of UNU Blitar is swimming. It has a fairly high weight, that is 4 Credit Course (SKS). The swimming course is divided into 2 credits, they are basic swimming skills in odd semesters and 2 credits of swimming skills courses in even semesters. The basic swimming skills include Front Crawl and Breaststroke while swimming skills courses cover all styles.

In basic swimming courses, it is necessary to teach from the easiest movements to those that are difficult to do. Complex swimming movements start from very simple movements so that students can easily understand and practice. As Malik (2015) said, Using the aspect of the training startegy, a tutor or trainer breaks down a skill into small parts that students can practice one after the other until they can perform the entire set of movements.

According to Nohantiya (2020) in swimming learning, the first thing that needs to be prepared is the tools and understanding of the rules in the pool. Secondly, psychological preparation (related to the psychiatric factors of swimmers), instills courage, calmness, pleasure, and self-confidence. Third, Physical preparation by doing enough warm-up. Next, what needs to be done is the introduction of water starting from washing the face, walking in the water, jogging, and holding the breath in the water. Next, students can be taught floating techniques and glid-
ing techniques in a straight position on the water’s surface (streamline body position). If students have mastered it, the next movement that can be taught is the technique of leg movement. Neither legs movement on land, nor in the pool. Next moved both arms alternately. In the final phase, breathing techniques are taught in accordance with the learnt swimming style.

After students have been taught in parts, the next step is to combine two techniques or three techniques into one. For example, teaching gliding techniques with leg techniques at the same time. Arms techniques and breathing techniques are trained at one time or gliding techniques, legs techniques, and arms techniques. In the final stage, all the swimming techniques learned in parts are combined into one complete series of movements, namely swimming with a certain style. From this theory, researchers apply a sequence of movement material in learning to swim, namely from the introduction of water, the floating position, streamlined body position, gliding, leg movements, arms movements, breathing movements, and finally coordination of swimming movements both Front Crawl and Breaststroke.

Swimming learning will be easier for students to accept if it is done directly. However, because the time is limited, only once face-to-face a week it is difficult to achieve learning goals if not added by own practice. Therefore, researchers developed Android-based Swimming Learning Media Mobile Learning Applications in Basic Swimming Lectures at Universitas Nahdlatul Ulama Blitar. It is expected that students can learn independently outside of lectures with mobile learning application media.

Learning media is an instrument that can support the process of teaching and learning by helping to make the message better and assist students achieve the learning objectives with greater effectiveness. In addition, learning media is also a means to improve activity for teaching and learning. Digital learning media that is so flexible and easily accessible to all groups makes the development of information such as learning materials able to be reached by students even though it is outside the scope of school and is not bound by time. According to Wirawan (2011), "Mobile learning is one of the alternatives to learning media development". According to Lutfianto (2021), Mobile learning (M-Learning) is a learning medium that utilizes cellular phone technology. Mobile learning is a medium or means that greatly helps students in the learning process on material that is less mastered anywhere and anytime.

The previous study by Nohantiya, Fatra (2020) entitled Development of Augmented Reality Based Crawl Swimming Learning Module For Students of The UNU Blitar Sports Education Study Program still discusses only one style, namely front crawl. While lectures on basic swimming skills two styles need to be learned. Not only front crawl but also Breaststroke. It also requires an in depth study that takes the Industrial Revolution 5.0, that is with the addition of Android-based technology Mobile learning applications. It is expected that students can understand swimming techniques by getting information quickly, precisely, and accurately by utilizing cellular phone technology.

**Materials and Method**

The study model applied in the study refers to the Research and Development (R & D) Model of development from Dick and Carey. This method was chosen in accordance with the researchers’ aim, which is to make a basic swimming learning instrument development product in the form of a mobile learning application as shown in the Figure 1.

The Dick and Carey development model includes 10 steps, namely:

1. **Identify Instructional Goals**
2. **Conduct Instructional Analysis**
3. **Identify Entry Behaviours**
4. **Write Performance Objectives**
5. **Develop criterion Reference Tests**
6. **Develop Instructional Strategy**
7. **Develop Instructional Strategy**
8. **Design Instructional Materials**
9. **Administer Instructional Materials**
10. **Evaluate Instructional Product**
The development study continues through to the ninth stage, which involves making changes to the product. Data analysis techniques are one of the important steps in development research activities. Data analysis methods are used by researcher are both qualitative and quantitative. By limiting the data (summarizing, selecting essential elements, concentrating on the most crucial aspects), qualitative data analysis techniques are used to examine expert recommendations and inputs. The data is then presented through the conclusion phase. (Sugiyono, 2012).

The data's findings are examined quantitatively using percentages. Descriptive analysis using percentages is the data analysis method employed. The formula used to process data using large group test, needs analysis, and small group test data using descriptive data analysis approaches in the form of percentages. The technique used to process data in percentage descriptives according to Akbar &; Sriwiyana (2010), is as follows:

\[ V = \frac{TSEV}{S_{-max}} \times 100\% \]

Information:
V = Validity
TSEV = Total Empirical Score of Validators
S-max = Expected maximum score

After then, the data is examined. The percentage level criterion table displays the percentage level categorization criteria based on the data analysis findings according to Akbar and Sriwiyana (2010) as follows:

<table>
<thead>
<tr>
<th>Percentage Level</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% - 100%</td>
<td>Valid/ digunakan</td>
</tr>
<tr>
<td>60% - 79%</td>
<td>Cukup Valid/ digunakan</td>
</tr>
<tr>
<td>50% - 59%</td>
<td>Kurang Valid/ digunakan</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>Tidak Valid/ digunakan</td>
</tr>
</tbody>
</table>

Table 1. Percentage Level Criteria (Source: Akbar and Sriwiyana, 2010)

1. Stage of analyzing needs by conducting preliminary studies
2. Identify, analyze, and develop learning competencies to be developed based on Dick and Carey's phases
3. Review and update development product in light of respondent’s and expert’s opinions
4. Results in the form of Mobile Applications learning basic swimming materials for UNU Blitar students

Results and Discussion

Identify Instructional Goals

The first thing researchers conduct is to identify The general objective of development, which provides the foundation for choosing the subsequent course of action. According to the information in the swimming course syllabus, students should be able to know, comprehend, analyze, and practice front crawl and breaststroke.

Conduct Instructional Analysis

The second stage is to analyze swimming course. The material contained in the application consists of Information about swimming, Basic Swimming Concepts, Preparation Before Swimming, Basic swimming skills, Front Crawl, Breaststroke, start, and water trapen.

Identify Entry Behaviours

The identification of UNU Blitar students enrolled in the Sports Education Study Program is the basis of this study. It was found that as many as 67% could not swim and students began learning to swim while studying at UNU Blitar. After being interviewed, some of them said they had not been taught swimming material in either junior high or high school. It was found that the reason for not carrying out swimming learning was because there were no facilities and
infrastructure, as well as because of the principal's policy that worried about student safety. 100% of respondents indicated that face-to-face 2 hours of lectures or once a week is insufficient. They need media that can be utilized as a reference outside of lecture hours. With the limitations of face-to-face meetings held by lecturers, students need to add training outside of lecture hours. While related to learning media, students prefer Android phones over books because they are simpler and easier to carry.

**Write Performance Objectives**

The next step is to formulate learning objectives. Contains a description of something that students can do after completing learning. The purpose of the performance is to encourage the application of all knowledge, skills, and attitudes of students in real-life contexts outside of face-to-face learning with lecturers.

**Develop criteria Reference Tests**

At this stage, researchers develop assessment instruments for questionnaires that will be used during the expert validation process and student response questionnaires.

**Develop Instructional Strategy**

Learning strategy has been explained by Dick and Carey as follows: (1) activities before learning, (2) Deliver material or substance, (3) taking part of the learner, (4) examination, and (5) follow-up activities (Dick and Carey, 2001: 189). In this situation, researcher establish only the first to third aspects. Development of learning strategies for students and integration with mobile learning applications.

**Set up and Choose Learning Materials**

Development and teaching materials contained in the mobile learning application for students of the sports education study program at Universitas Nahdlatul Ulama Blitar are as follows:

**Information About Swimming**

In this information, researchers present information about swimming, goals, and instructions for using mobile learning applications.

**Basic Swimming Concepts**

A. History of Swimming

A. Definition, Aim, and advantages of Swimming
B. Swimming Equipment
C. Different swimming style

**Swimming Preparation**

A. Pool Rules
B. Psychological preparation
C. Physical preparation

**Basic Swimming Skills**

A. Water Introduction
B. Breathing in the Water
C. Streamline Body Position
D. Standing exercises
E. Gliding

**Front Crawl Stroke**

A. Legs Movement Technique of Front Crawl
B. Arms Movement Technique of Front Crawl
C. Breathing Exercise Technique of Front Crawl
D. Swimming coordination movement of Front Crawl

**Breaststroke**

A. Leg Movement Techniques of Breaststroke
B. Arms Movement Technique of Breaststroke
C. Breathing Exercise Techniques of Breaststroke
D. Swimming coordination movements of Breaststroke

**Start**

A. Train courage before the start
B. Start from the top of the pool
C. Start from inside the pool

**Water Trapen**

Is a technique of floating in water

**Set up and carry out formative assessment**

Formative assessment is being implement-ed with the intention of collecting feedback regarding the benefits and drawbacks of basic mobile learning application media. which can be used as input material to improve the application. Evaluation from media experts related to basic swimming learning media based on Android mobile learning applications, swimming experts related to the suitability of content with swimming material. Expert data collection is carried out by providing initial products for learning media mobile learning applications
Table 2. Data Analysis of Media Expert Validation Results

<table>
<thead>
<tr>
<th>No</th>
<th>Indikator</th>
<th>Skor min</th>
<th>Skor maks</th>
<th>Skor Hasil</th>
<th>%</th>
<th>Keterangan</th>
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<tbody>
<tr>
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<td>91.67</td>
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<td>3</td>
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<td>35</td>
<td>97.22</td>
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<td>15</td>
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</tr>
<tr>
<td>5</td>
<td>Kemenarikan</td>
<td>3</td>
<td>12</td>
<td>11</td>
<td>91.67</td>
<td>Sangat Valid</td>
</tr>
</tbody>
</table>

Rata-rata 94.86

Table 3. Data Analysis of Swimming Learning Expert Validation Results

<table>
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<tr>
<th>No</th>
<th>Indikator</th>
<th>Skor min</th>
<th>Skor maks</th>
<th>Skor Hasil</th>
<th>%</th>
<th>Keterangan</th>
</tr>
</thead>
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<td>31</td>
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<td>2</td>
<td>Ketepatan</td>
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<td>100</td>
<td>Sangat Valid</td>
</tr>
<tr>
<td>3</td>
<td>Kesesuaian</td>
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<tr>
<td>4</td>
<td>Kemenarikan</td>
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<td>12</td>
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<td>100</td>
<td>Sangat Valid</td>
</tr>
<tr>
<td>5</td>
<td>Kebermanfaatan</td>
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<td>4</td>
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<td>Sangat Valid</td>
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</tbody>
</table>

Rata-rata 98.26

Table 4. Data Analysis of Small Group Trial Results

<table>
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<tr>
<th>No</th>
<th>Indikator</th>
<th>Skor min</th>
<th>Skor maks</th>
<th>Skor Hasil</th>
<th>%</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
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<td>Kejelasan</td>
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<td>Pemahaman</td>
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<td>186</td>
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<td>24</td>
<td>24</td>
<td>100</td>
<td>Sangat Valid</td>
</tr>
</tbody>
</table>

Rata-rata 96.61

Results Of Media Expert Data Analysis

The following table presents the findings of media experts’ data analysis on product validation (shows on Table 2):

along with assessment sheets in the form of application display, text, images, design, menus, content, clarity, and attractiveness.

Figure 2. Data Analysis of Specialists’ data on Validation Results

Figure 3. Data Analysis of Swimming Learning Expert Validation Results

Figure 4. Data Analysis of Small Group Trial Results

Figure 5. Data Analysis of Large-Scale Trial Results
Media Expert Validation Results Indicator

Based on Table 2, it is known that there are 5 indicators, namely: Application display (91.67%) is very valid, Text display (100%) is very valid, Image display (97.22%) is very valid, Design (93.75%) is very valid, and attractiveness (91.67%) is very valid. The product can move forward to the trial stage based on the verified outcomes.

Results of Data Analysis of Swimming Learning Experts

The results of product validation data analysis by pool learning experts are shown in the Table 3.

Swimming Learning Expert Validation Results Indicators

According to Figure 3. It is known that there are 5 indicators, namely: Clarity (96.88%) is extremely valid, Accuracy (100%) is extremely valid, Conformity (94.44%) is extremely valid, Attractiveness (100%) is extremely valid, and usefulness (100%) is extremely valid. According to the validated results, without revision, the product can move on the trial phase.

Results of Small Group Trial Analysis

At this stage, a small-scale trial was conducted on 6 respondents. Data was collected and analyzed during trials. From small-scale trial data, researchers will use it to revise the products that have been produced. The following results of small group data analysis are shown in the Table 4:

Based on Figure 4. It is known that there are 4 indicators, namely: Clarity (95.14%) is extremely valid, Attractiveness (94.44%) is very valid, Understanding (96.88%) is very valid, and usefulness (100%) is very valid. As stated the validated results, the product can proceed to the large group stage of trial.

Analysis Results of Large-Scale Trials

The Sports Education Study Program’s 34 responders were all included in the Large-Scale Trial at Nahdlatul Ulama University of Blitar. Large-scale trials are carried out to find out how attractive the products are. Data is collected and analyzed. From the large-scale trial data, researchers will use it to revise the final stage product on the developed mobile learning application pool learning media. This final revision aims to make the media suitable and suitable for use. The outcome of data analysis of large-scale trial results are showed in the Table 5:

Based on Figure 5. It is known that there are 4 indicators, namely: Clarity (94.49%) is extremely valid, Attractiveness (92.40%) is extremely valid, Understanding (95.96%) is extremely valid, and usefulness (89.58%) is very valid. According to the outcome of the validation above, all requirements are satisfied, and the product is feasible so the development of android-based swimming learning media mobile learning applications in basic swimming lectures is declared extremely valid and appropriate for use.

Revise instructional

The revision of learning at this final phase is an improvement that leads to the perfection of the developed product. Revision is needed for the creation of a viable product to produce the product as expected. The following is a display of learning media products swimming mobile learning applications:

Conclusion

The conclusions from the outcome of this development research are: 1) Development of Android-Based Swimming Learning Instrument Mobile Learning Applications In Basic Swimming Lectures at Universitas Nahdlatul Ulama Blitar completed with the Research and Development (R & D) model of development from Dick and Carey. This successfully developed product is an application that supports classroom learning and individual learning based on Android phones. The menus that have been tailored to the needs of students are: Information about swimming, Basic Swimming Concepts, Preparation Before Swimming, Basic swimming skills, Front Crawl, Breaststroke, start, and water trapen. 2) Android-Based Swimming Learning Media Mobile Learning Applications in Basic Swimming Lectures at Nahdlatul Ulama University Blitar is very feasible to use and maximize the basic swimming courses are learned.

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Suggestion

In this research of development, of course, there are still many shortcomings. This research is still limited to basic swimming. To provide greater usefulness, users should use this mobile learning application by existing instructions. As for further research, it can develop according to the needs or basic competencies to be achieved. It is also expected that further researchers can make variations in application design and develop more complete material with the addition of backstroke and butterfly styles. It is intended that this application will be utilized in the future for more than only at UNU Blitar but can be implemented more widely in other universities that have sports study programs.

References


