Audio-visual teaching materials supporting tennis

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Abstract

The process of learning tennis skills begins with the cognitive, associative, and automation stages. The cognitive stage is the most basic stage, so it is necessary to identify student learning styles at this stage. The learning styles that are widely used at the cognitive stage are visual and auditory learning styles. Teaching materials in the form of audio-visual can facilitate student learning styles at the cognitive stage. This research aims to develop audio-visual teaching materials for teaching tennis courses. The research method used is *research and development*. Then a sample was taken using a simple random sampling technique of 25% representing the entire population. So that the research subjects obtained as many as 47 students. The research instrument is a closed questionnaire that has obtained validation from experts. Questionnaires were used to retrieve response data from research subjects who had used the developed research product. Then the data were analyzed with the help of CAQDAS software. The study results were that an average of more than 90% of the research subjects gave positive responses to the tennis court audio-visual teaching materials, which were seen from the responses of the research subjects to the indicators in the developed teaching materials. So, it can be concluded that the audio-visual teaching materials for teaching tennis courses are feasible to use.

Keywords: audio-visual, teaching materials, tennis

INTRODUCTION

Sports education is closely related to physical activity. One physical activity students carry out is learning motion to master a skill. The functions of physical education and sports are biological, movement, psychological and social which are related to the concept of balanced and integrated personality development (Jeong & So, 2020). This statement makes clear that one of the functions of sports education is to learn student movement.

Learning motion requires stages to master the desired skill. Conveyed that skills learning was carried out through three stages of sports education learning, namely: (1) cognitive stages, (2) associative stages, and (3) automation stages (Adi & Fathoni, 2019, 2020; Fathoni, 2018). Montero-Carretero & Cervelló (2020) also mention that the three stages of movement learning include cognitive, associative, and autonomous learning. The change from the associative stage to the autonomous stage is characterized by mastery of movement, so it can be

interpreted that the autonomous stage has the same meaning as the automation stage. These stages are depicted in Figure 1 below.

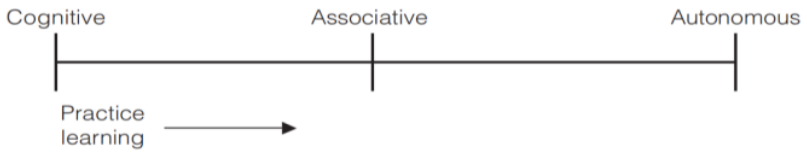

Figure 1. Model of Movement Learning Stages (Lleixà & Nieva, 2020)

It is known that the movement learning stage begins with the cognitive stage. So that this cognitive stage could be the beginning or the basis for success in learning motion. (Spampinato & Celnik, 2021). Students in the Physical Education Study Program who take Field Tennis lectures carry out *Mobile Learning learning* by utilizing learning resources that support their visual and auditory learning styles. They usually do it outside lecture hours which can later be used as a provision for the face-to-face learning process by utilizing a kinesthetic learning style.

The use of mobile learning by utilizing audio-visual teaching materials for students aims to answer the problem of the lack of court tennis learning time in a college environment. The number of meetings for tennis lessons only gets 16 meetings in one semester. The 16 meetings were deemed very unlikely to be effective in making students skilled in practicing techniques in the game of tennis. The decision to use mobile learning by utilizing audio-visual teaching materials is based on the needs analysis results for physical education students. The results of the needs analysis showed that 96.7% of students stated that there needed to be additional hours outside the face-to-face tennis lecture hours that were used to improve the tennis learning process. Then as many as 95.3% of students agreed to develop court tennis audio-visual teaching materials for mobile learning outside face-to-face lecture hours.

Using audio-visual teaching materials for tennis learning in mobile learning, students can learn basic tennis technical skills six days before

the face-to-face lecture schedule is carried out. Students can build cognitive understanding by studying audio-visual in these six days.

The problem to be researched is whether the developed audio-visual teaching materials can help and improve students' understanding of Field Tennis learning. This research aims to facilitate students who take Field Tennis lectures in the form of audio-visual teaching materials and measure how appropriate students use the teaching materials. This research has an urgency, namely the importance of Field Tennis learning material from a credible source, namely the lecturer who oversees the course itself. So that the material provided can be accounted for and make all students have the same perception of understanding. This court tennis audio-visual teaching material has a continuous contribution to providing field tennis material to students from year to year because these teaching materials will be used forever.

Problem-solving is done by developing audio-visual teaching materials used in mobile learning. They have gone through several considerations and literature reviews from the results of the research that has been done. As in learning physical education at school, after the teacher provides audio-visual jar materials, it turns out that students are much faster in learning a movement skill (Arike & Olufemi, 2018). Then in other fields, but also studying skills and skills training, it turns out that using audio-visual teaching materials can make students understand and get a perception of the skills to be learned (Hayati et al., 2020). Then the results of a study of other library sources found that audio-visual teaching materials could stimulate students' cognitive intelligence to learn a skill (Zhu et al., 2021).

METHOD

Research Design

The design or approach used in this research is to use research and development. Because indeed the problem was found, one way to solve the problem is to develop a product in the form of teaching materials to support Student Mobile Learning (Nind et al., 2020).

Population and Sample

The research subjects involved were physical education students with a population of 188 students. Then from the entire population, samples were taken using a simple random sampling technique of 25% representing the entire population. So that the research subjects obtained were 47 students. The random sample selection of course also considers the diversity of students and characteristics (Lukosch & Comes, 2019).

Data Collection Techniques the Data

Collecting data in the study using a questionnaire. The indicators used for data collection are the accuracy and suitability of the presentation of the material, the attractiveness of the teaching materials, the ease of use, the ease of understanding the material, the composition of the layout, the clarity of the images, and the clarity of the audio. There are two types of questionnaires used, namely closed and open questionnaires.

Data Analysis Techniques

Data analysis in this study used descriptive quantitative data analysis and narrative analysis. Descriptive quantitative data analysis was used to analyze the data obtained from closed questionnaires. Meanwhile, narrative analysis was used to analyze the data obtained from open questionnaires. Then the data were analyzed with the help of CAQDAS software.

Research Procedures

Research and development go through several procedures that have been determined according to the conditions of the researcher. The research procedures carried out are a) Needs analysis, b) Product development of audio-visual teaching materials for Field Tennis courses, c) Product validation, d) Product improvement, e) Second product validation, f) Small-scale product trial, g) Product improvement, h) Large-scale product trial, and i) Dissemination.

RESULT

The results of this research are audio-visual teaching materials for tennis learning. As explained in the method chapter, this audio-visual teaching material needs to get user feedback and ratings. The following is an example of the display of audio-visual teaching materials for tennis learning.

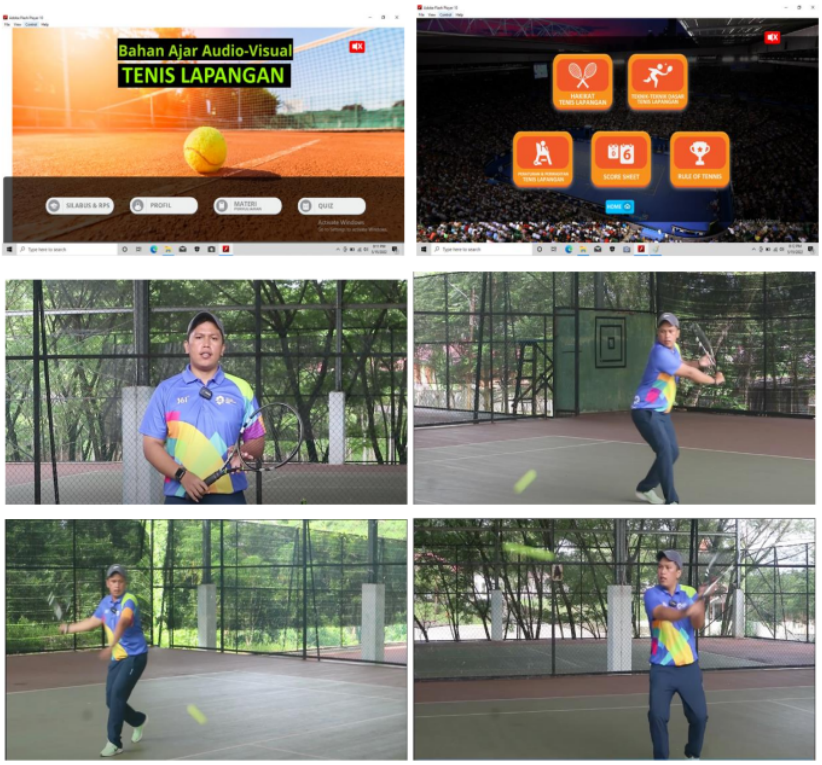

Figure 2. Display of Audio Visual Teaching Materials for Tennis Field Learning

A descriptive analysis of the answer test instrument on 20 statements was carried out to see the accumulated frequency of respondents' answers to each statement, which was useful for concluding. The results of the descriptive analysis are as follows. In general, the product of tennis teaching materials in the form of audio-visual can present tennis materials. The results of the descriptive analysis showed that 19 respondents (40.4%) answered correctly, and 28 respondents (59.6%) answered very correctly on the statement that the teaching materials of court tennis in the form of audio-visual were able to present tennis materials. The average

respondent's answer is 3.6, so it can be concluded that overall, the respondents feel that the teaching materials of court tennis in the form of audio-visual can present the materials of tennis courts are very appropriate.

Table 1. Accuracy of Presenting Tennis Materials

Answer	Frequency	Percentage	Average
Exact	19	40.4%	
Very Accurate	28	59,6%	3.6
Total	47	100%	

Clarity of content of the product material for tennis teaching materials in audio-visual form.

Table 2. Clarity of Content Product Materials Teaching

Answer	Frequency	Percentage	Average
Less Clear	1	2.1%	
Clear	15	31.9%	3.64
Very Clear	31	66%	
Total	47	100%	

The opening display on the audiovisual is in the form of text with variety of fonts and animated images accompanied by interesting musical instruments.

Table 3. Opening Display Audio Visual

Answer	Frequency	Percentage	Average
Less Attractive	2	4.3%	
Interesting	15	31.9%	3.6
Very Attractive	30	63.8%	
Total	47	100%	

Ease of operating or running teaching material products in the form of audiovisual.

Table 4. Ease of Operating or Running Teaching Material

Answer	Frequency	Percentage	Average
Very Difficult	1	2.1%	
Difficult	1	2.1%	
Easy	20	42.6%	3.47
Very Easy	25	53,2	
Total	47	100%	

The concept of historical material and tennis court facilities and infrastructure in audiovisual is easy to understand.

Table 5. Ease of Understanding Concepts about History Materials and Tennis Facilities and Infrastructure

Answer	Frequency	Percentage	Average
Difficult	2	4.3%	3.53
Easy	18	38.3%	

Very Easy	27	57.4%
Total	47	100%

Concept about material history, facilities, and infrastructure of tennis courts in interesting audio-visual form.

Table 6. Interesting Concepts About History Materials, Facilities, and Infrastructure of Tennis Courts

Answers	Frequency	Percentage	Average
Interesting	16	34%	
Very interesting	31	66%	3.66
Total	47	100%	

The concept of basic tennis technical materials in audio-visual is easy to understand.

Table 7. Ease of Understanding Concepts About Basic Field Tennis Techniques

Answers	Frequency	Percentage	Average
Very difficult	1	2.1%	
Easy	21	44.7%	3.49
Very easy	25	53.2%	
Total	47	100%	

Concepts about basic technical materials tennis court in an interesting audio-visual form.

Table 8. The attractiveness of Concepts About Basic Techniques of Field Tennis

Answers	Frequency	Percentage	Average
Less attractive	2	4.3%	
Attractive	10	21.3%	3.7
Very interesting	35	74.5%	
Total	47	100%	

Concepts about rules and refereeing materials Court tennis on audiovisual is easy to learn.

Table 9. Ease of Learning Concepts About Materials for Rules and Refereeing Tennis Courts

Answers	Frequency	Percentage	Average
Very difficult	1	2.1%	
Difficult	3	6.4%	
Easy	16	34%	3.47
Very easy	27	57.4%	
Total	47	100%	

The concept of court tennis rules and refereeing materials in an interesting audio-visual form.

Table 10. Interesting Concepts About Materials for Rules and Refereeing Tennis Courts

Answers	Frequency	Percentage	Average
Unattractive	1	2.1%	3.64
Attractive	14	29.8%	
Very interesting	32	68.1%	
Total	47	100%	

Concepts about how to fill out material Court tennis scoresheets on audiovisual are easy to learn.

Table 11. Ease of Learning Concepts About Materials How to Fill out Tennis Scoresheets

Answers	Frequency	Percentage	Average
Difficult	3	6.4%	3.45
Easy	20	42.6%	
Very easy	24	51.1%	
Total	47	100%	

Concepts about how to fill out materials tennis scoresheets in attractive audio-visual format.

Table 12. Interesting Concepts About Materials How to Fill out Tennis Scoresheets

Answers	Frequency	Percentage	Average
Interesting	18	38.3%	3.62
Very interesting	29	61.7%	
Total	47	100%	

The concept of the rule of tennis material in audio-visual is easy to understand.

Table 13. Ease of Learning Concepts About Rule Of Tennis Material

Answers	Frequency	Percentage	Average
Difficult	2	4.3%	3.6
Easy	15	31.9%	
Very easy	30	63.8%	
Total	47	100%	

Concepts about the rule of tennis material in interesting audio-visual form.

Table 14. Interesting Concept About Rule of Tennis Material

Answer	Frequency	Percentage	Average
Not interesting	1	2.1%	3.62
Interesting	15	31.9%	
Very interesting	31	66%	
Total	47	100%	

Quiz exercises contained in the product teaching materials in interesting audio-visual form.

Table 15. The attractiveness of Exercise Quiz found in Teaching Material Products

Answer	Frequency	Percentage	Average
Not interesting	4	8.5%	3.53
Interesting	14	29.8%	
Very interesting	29	61.7%	
Total	47	100%	

Combination of arrangement and material selection in the product of tennis teaching materials in the form of audio-visual.

Table 16. Accuracy of Order Combination and Material Selection in Field Tennis Teaching Materials

Answer	Frequency	Percentage	Average
Exact	17	36.2%	3.64
Very precise	30	63.8%	
Total	47	100%	

Clarity of images on indoor tennis teaching materials in this audio-visual form.

Table 17. Clarity of Pictures on Field Tennis Teaching Materials

Answer	Frequency	Percentage	Average
Unclear	1	2.1%	3.6
Less clear	2	4.3%	
Clear	12	25.5%	
Very clear	32	68.1%	
Total	47	100 %	

The clarity of the video on the product of tennis teaching materials in this audio-visual form.

Table 18. Video Clarity on Field Tennis Teaching Material Products

Answers	Frequency	Percentage	Average
Less clear	2	4.3%	3.64
Clear	13	27.7%	
Very clear	32	68.1%	
Total	47	100%	

Presence of backsound music on product materials Teaching tennis in audio-visual form is appropriate to support the learning atmosphere.

Table 19. Accuracy of Musical Backsound on Field Tennis Teaching Materials

Answer	Frequency	Percentage	Average
Inaccurate	1	2.1%	3.62
Exactly	16	34%	
Very precise	30	63.8%	
Total	47	100%	

Feasibility of indoor tennis teaching materials This audio-visual form is used as a learning medium on campus.

Table 20. Product Feasibility of Field Tennis Teaching Materials

Answer	Frequency	Percentage	Average
Not feasible	1	2.1%	3.64
Eligible	14	29.8%	
Very feasible	32	68.1%	
Total	47	100%	

DISCUSSION

Accuracy in presenting the material is very important (Kurniawan & Trimasukmana, 2020) because teaching materials must be relevant to the primary material to be delivered (Karlina & Setiyadi, 2019) so that the learning process can run effectively (Naibaho, 2019). Looking at the results of the data related to the accuracy of the presentation of the tennis material, all respondents stated that it was correct. However, all the respondents were divided into two choices of the main scale and the second scale. However, this proves that the product of teaching materials developed from the results of this research is appropriate to be used to convey court tennis learning materials. In addition, the clarity of the content of the material also needs to be considered. Therefore, the respondents need to respond to the indicators of material clarity. Seeing the results, only 2.1% of respondents felt it was not clear. But the rest stated clear criteria. So, it may be necessary to pay attention when developing further indicators for the clarity of the content of this material. It is possible to do a more detailed analysis again.

Then discuss the attractiveness of the opening display, which is an advantage of this teaching material product because an interesting opening will provide a positive stimulus in the learning process(Ardina et al., 2020; Faizah et al., 2020; Sarwinda et al., 2020). The data showed that the opening display of audio-visual teaching materials was considered attractive by the respondents. Around 95.7% said it was interesting even though the responses were divided into two main and second scales. The results of the attractiveness responses can be judged that the teaching material products have an interesting opening display. Although there are still around 4.3% stating that it is less attractive, it is considered not too significant because the assessment of attractiveness is relative.

Next, discuss the ease of teaching material products. The indicator of the ease of teaching materials is very important to take into account (Cendra et al., 2019; Mufidah et al., 2020) because easy use will provide time efficiency in learning (Acim & Situmorang, 2019; Raibowo et al., 2020). So that the material information conveyed can be quickly transferred to students who are studying. The data results show that the respondents' ratings are evenly distributed on four scales. However, the two positive scales have good results, namely, around 95.8% of respondents stated that the teaching materials developed were easy to use, so it can be ascertained that this teaching material can help the student learning process with its easy use.

Then the ease of understanding the material also needs to be questioned. Because this is related to how the material is delivered using audio-visual teaching materials and how it is presented (Adnyani et al., 2020; Mutia et al., 2020; Rifmasari, 2021) affects the ease of students in understanding and time efficiency to learn. The material presented was the history, facilities, and infrastructure of tennis courts, basic techniques of tennis, tennis rules and arbitration, filling out tennis scoresheets, and finally, the rule of tennis. The study results showed that the material presented was above 90% of the respondents stated that it was easy to learn, so the presentation of the material in this teaching material is considered to facilitate student learning.

Because the interest will provide a stimulus to study the material presented (Ma et al., 2020; Skrzypulec, 2021; Zhu et al., 2021), in addition to seeing the ease of learning the material, the attractiveness indicators of each presentation also need to be seen. From some of the material described in the previous paragraph, 90% of respondents, on average, stated that they were interested in two positive scales. Indeed, this percentage of attractiveness has decreased. Because the respondents were scattered, they were assessed on four response scales. However, the distribution of the assessment is reasonable because the attractiveness is relative.

In the audio-visual teaching materials containing court tennis material, quizzes are also presented to be used as a measuring tool for student knowledge in learning tennis material. This quiz is packaged in an attractive form and designed to make students more comfortable answering the questions (Coleman et al., 2018; Djannah et al., 2020; Simmonds et al., 2020). For this reason, respondents in the study were asked for responses, and the results were more than 90% stated that they were interested in the quiz presented. So it can be considered that respondents can accept this quiz as users.

Then in audio-visual teaching materials several supporting indicators influence the use of audio-visual as teaching materials. Some of these indicators are the accuracy of the combination of arrangement and material selection, image clarity, video clarity, and the accuracy of the use of background music. The arrangement of the appearance and material is very influential in the comfort of learning, so it is very important to pay attention to supporting audio-visual teaching materials (Engeln & Groh, 2021). In the audiovisual that was developed, all respondents stated that the combination of arrangements was right. This means that the respondents have accepted the audio-visual arrangement.

Furthermore, other influencing indicators are the clarity of images and videos. Because the teaching material developed is court tennis material, it requires pictures and videos to display the technical skills students will learn (Winarto et al., 2020). More than 90% of respondents stated that the pictures and videos were clear. So that the transfer of material information for tennis skills can be more effective. Then a supporting indicator that is no less important is the accuracy of the background music. Backsound music is given to provide a stimulus and condition the souls and minds of students to be able to learn optimally (Hou et al., 2018). More than 95% of respondents stated that the background music contained in the audio-visual teaching materials was appropriate. So it is felt that the backsound can support the effectiveness of student learning using the audiovisual.

All the indicators discussed are constituent components in assessing the feasibility of tennis teaching materials packaged in audio-visual form. So that after all the respondents gave their responses, it is necessary to conclude by the respondents whether the teaching materials developed are feasible to use. This is because the previously assessed indicators are the components, so teaching materials can be appropriately used (Ban et al., 2021). The results of the respondents' responses, as much as 97.9%, stated that the tennis teaching materials packaged in audio-visual form were suitable for use. The dominant response becomes a reference for the conclusion that the teaching materials developed are ideal for use.

CONCLUSION

Based on the data obtained, audio-visual teaching materials to support the learning of tennis courses are appropriate. Audio-visual teaching materials are suitable to meet student learning styles with various supporting indicators to facilitate student learning styles that vary greatly. In addition, the existence of teaching materials in the form of audiovisuals that are suitable for use will support the learning process using the mobile learning method because students can study anywhere and anytime according to the student's needs. So that students will have their learning needs met according to their needs.

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