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DEVELOPMENT OF MOBILE-BASED LEARNING MEDIA FOR THE SUPERVISION OF PHYSICAL EDUCATION AND SPORTS TRAINING

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Abstract

This study develops a mobile-based learning media to support supervision in physical education and sports training. The development followed seven stages: research design, user needs analysis, application design, development, trial and evaluation, revision, and implementation/dissemination. User requirements were collected from supervisors, coaches, and teachers to determine core functions for supervision, including structured learning modules, activity documentation, evaluation quizzes, scoring logic, and progress monitoring. The application was implemented and piloted in a PJOK teacher working group context, using a pretest-posttest scheme and a usability evaluation based on the System Usability Scale (SUS). The results indicate increased user knowledge after using the application and a mean SUS score of 77, corresponding to a good usability level. The developed media provides practical support for supervision workflows by enabling access to learning materials, standardized evaluation, and progress tracking through a mobile interface. These findings suggest that mobile learning media can improve the efficiency and consistency of supervision practices in physical education and sports training.

Keywords: Learning media development; Mobile applications; Physical education supervision; Sports training, Supervision.

1. Introduction

Physical education and sports training play a vital role in developing students' physical health, motor skills, and well-being [1-4]. In the context of sports education and training, supervision by supervisors and coaches is vital to ensure that the learning process is effective and high-quality [5]. However, effective supervision often requires careful observation, timely feedback, and accurate documentation of student-athlete progress. In today's digital technology era, mobile applications have become a very useful tool in various fields [6-9], including education and sports. By using popular mobile platforms, supervisors and coaches can utilize mobile-based applications to monitor and record student athletes' physical activities, provide real-time feedback, and manage data and documentation related to student progress [10-12].

However, despite the enormous potential of mobile technology for physical education and sports training supervision [13], there is still a need to develop learning media tailored to user needs and the characteristics of sports learning. Mobile technology has increasingly developed and become an integral part of the world of education [14, 15]. Mobile-based applications have been used in various learning contexts to facilitate teaching, learning, and evaluation [16]. Several applications have been developed to support physical education and sports training. Some of these provide features such as tracking physical activity, developing training programs, and generating and analyzing athlete performance statistics [17-19]. Sports Supervision and Training: Supervision by supervisors and training by sports coaches are essential components in improving the quality of learning and athlete performance [20-23]. However, there are not many applications specifically developed to support sports supervision and training processes using mobile platforms. Several previous studies that discuss learning media and applications that have been used in research on the supervision of physical education and sports training [24, 25].

Available applications offer a variety of features and functionality, ranging from tracking athlete performance and creating customized training programs to managing data and documentation related to sports learning [26, 27]. Challenges in App Development: Developing apps for physical education and sports training is not without its challenges [28]. Some of the challenges that may be faced include the availability of accurate data, integration with appropriate hardware and sensors, and the need for a user-friendly and intuitive user interface [29].

Therefore, this study aims to fill this gap by developing mobile-based learning media that can support the process of physical education and sports training supervision effectively and efficiently. The problem-solving approach in this research begins with an in-depth analysis of user needs, including supervisors, coaches, and student athletes, to understand the challenges faced in the process of sports supervision and training, as well as the desired features in mobile-based learning media. A comprehensive literature review was also conducted to understand the approaches and technologies that have been used in the development of mobile-based learning media. Based on user needs analysis and literature review, an appropriate mobile-based application was designed and developed, including an intuitive user interface, the development of appropriate supervision and training features, and the integration of appropriate mobile technology.

Based on the results of the trial and user feedback, improvements and adjustments were made to the application to enhance its quality and performance. Novelties in this paper: developing mobile-based media ready for use, the application can be implemented and disseminated to potential users, such as schools, sports training centers, and sports organizations, so that it can have a positive impact in supporting the sports supervision and training process more broadly.

2. Methods

The research methodology for developing mobile-based learning media for physical education supervision and sports training will involve a series of structured steps. First, user needs analysis will be conducted through interviews, surveys, or focus group discussions with supervisors, coaches, and student athletes to understand their needs, preferences, and challenges in the sports supervision and training process. Based on the results of the user needs analysis, an application will be designed with an intuitive user interface and features that meet user needs. Wireframes and storyboards will be created to plan the application's layout and navigation. Next, the application will be developed using the Java programming language, with a focus on implementing sports supervision and training features such as physical activity tracking, training program development, and documentation of student-athlete progress. Based on the user needs analysis, the application will be designed with an intuitive user interface and features tailored to user needs. Wireframes and storyboards will be created to plan the application's layout and navigation. The application will then be developed using the Java programming language, focusing on implementing sports supervision and training features such as physical activity tracking, training program development, and student-athlete progress documentation.

The application will be piloted by supervisors, coaches, and student-athletes to gather feedback on performance, usability, and user satisfaction. The results of these pilot tests will be used to make improvements and adjustments to the application, including debugging, adding new features, and improving the user interface. Once the application is deemed ready for use, implementation and dissemination to potential users, such as schools, sports training centers, and sports organizations, will be carried out. This will involve user training, application promotion, and information dissemination through social media and other platforms. Thus, through this method, it is hoped that the developed application will meet user needs and expectations and make a positive contribution to the sports supervision and training process.

Figure 1 shows the research procedures carried out, including the initial stage of the research design selection process that is tailored to the needs of the user, after the results are obtained then the application is designed well, after the application is formed then it is tested and evaluated to check the records of the success of the application that has been built, if there are still any that are not appropriate then improvements and judgment are made to experts and users. Revisions made to the development of the application are adjusted to the records of field use and users. After revisions are done and the application is ready to use, it is implemented for users on a large scale, and the results are disseminated.

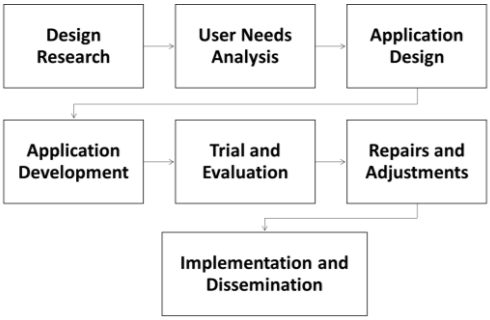

Fig. 1. Research procedures.

3. Results and Discussion

3.1. User needs analysis

The user needs analysis results indicate a significant need for mobile-based learning media that can facilitate physical education and sports training supervision. Users desire features such as performance recording, real-time feedback, and easy access to learning materials. Surveys and in-depth interviews revealed that the desired application must be intuitive, easy to use, and able to effectively support supervision activities [30, 31].

3.2. Application design

In the application design phase, a blueprint, wireframe, and mockup of the application were created. The user interface (UI) design focused on ease of use and clarity of navigation. Key features identified from the user needs analysis, such as performance recording and feedback, were integrated into the design. This design includes a user-friendly color scheme, easy-to-understand icons, and an intuitive layout. The following is a mockup of the application to be developed.

Figure 2 shows an explanation of the application development flow components, where the process begins with material planning by analyzing the material that is adjusted to the table of contents and preparation of application usage guide techniques, the second is designing the design interface in the form of UX and UI consisting of splash screens and on boarding sliders and the main menu is built home, progress and profile. The next stage is developing by assessing and providing feedback logically. If the development has been carried out, continue to implementation by testing it on users if it is successful, and if there are notes, then make revisions and evaluations; if not, then it is declared a complete application product developed for sports education supervision.

Figure 3 shows the steps for using the application, where the first step is initialization and introduction, as the application begins with a splash screen and three slides explaining the main features, such as comprehensive materials and learning evaluations. Next, access the material: users enter a structured list of materials, covering topics such as supervision in the digital era and the independent curriculum. Continued with the learning process on the material designed to help educators deliver physical education content systematically. Then carry out an evaluation (Quiz) which has an interactive quiz feature (for example, 30 questions) to assess user understanding. The evaluation results are carried out using scoring

logic as a system that displays the number of correct answers, incorrect answers, and the final score. In addition, progress monitoring is a feature that stores learning progress to help users decide whether to re-learn material that is not understood. Finally, profile management allows users to view identity, score history, and reset learning progress if necessary.

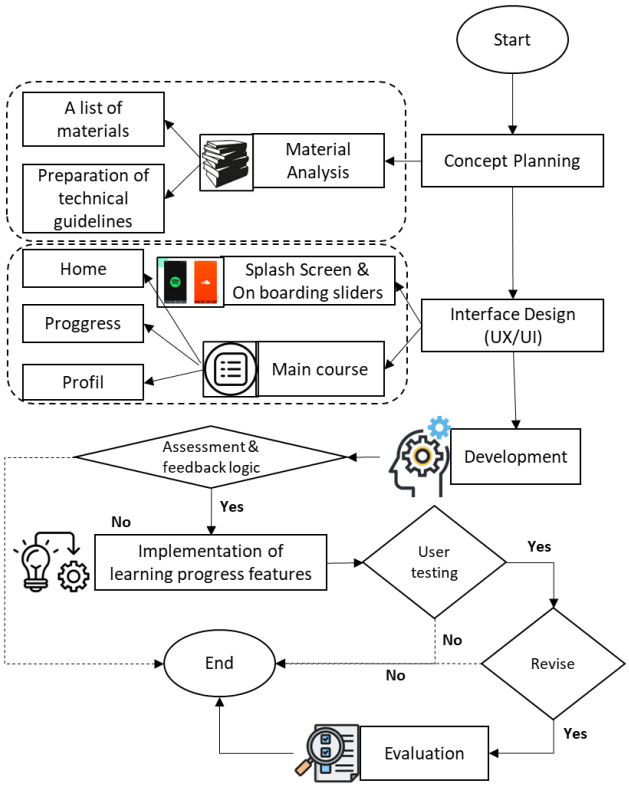

Fig. 2. Application design process flow.

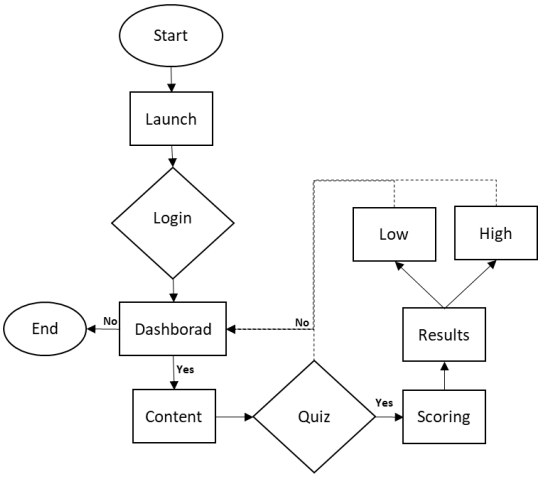

Fig. 3. Steps to use the application.

3.3. Application development

Figure 4 shows the appearance of the application design that has been built, where Fig. 4(a) shows the appearance of the initial page of the AMJO application. In this display, it welcomes users with a welcome to AMJO and provides information that this application is used to supervise education in the physical and sports department, while Fig. 4(b) shows the appearance of the material list page, where in this application there are 6 materials discussed, including: supervision of physical education in the independent curriculum era, in the digital era, a general explanation of educational supervision, division of approaches to methods and techniques of educational supervision, educational supervision in school organizations and supervision of educators. It is crucial to create a dedicated list of materials in a single view to guide and provide a user overview of the materials covered in the application, allowing users to select the materials they need directly. This can significantly increase the effectiveness of the application and the user's time [32, 33].

Figure 4(c) shows one of the materials explained in the application, the material presented is in the form of a narrative, but some of the material is not only presented in the form of material but is reinforced with videos that can be viewed by users as a deepening explanation of the material. This provides space for users with the ease of material appreciation through audio-visual-based media displayed through videos, the results of which provide more understanding to users compared to media without audio-visual media [34]. Meanwhile, Fig. 4(d) shows the evaluation page, where this page shows several multiple-choice questions that users must answer after understanding all the explanations from the previous page. The questions given and filled in will then display the final score on the final page. This is to provide information to users to the extent to which they have understood the material through this application. This evaluation is important to provide to users as material to determine the effectiveness of using media in understanding the material, so that the implementation of learning can be said to be meaningful or not [35].

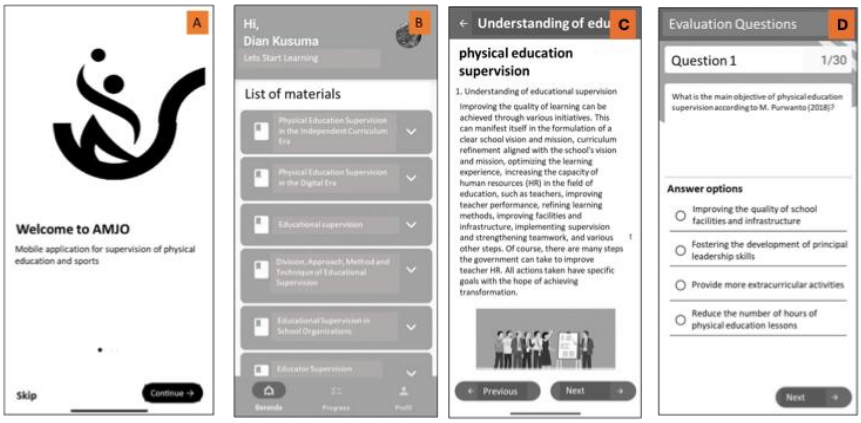

Fig. 4. Design application: (a) home page view; (b) list page view; (c) page materials, (d) page questions.

In the initial development phase of this mobile-based learning media, the primary focus was on conceptual design and application prototype development. The development team developed a basic framework that included user interface design, navigation structure, and core features that would support physical education and sports training supervision. This prototype aimed to provide an interactive platform through which teachers and coaches could access learning modules, provide instruction, and track student progress more effectively.

At this stage, the development team successfully developed the basic structure of the application, which included learning modules for various aspects of physical education and sports training. Development focused on features such as training schedule management, video guides, and a criteria-based evaluation system. These features were designed to support the supervision and training process by providing tools that simplify the organization and monitoring of student activities.

The application framework has been designed with user needs in mind, with an intuitive and responsive interface. Furthermore, the navigation scheme simplifies access to various learning modules, task tracking, and performance assessment. In addition to technical development, the team has also developed learning content to be integrated into the application.

The development of this mobile-based learning tool is on track to meet the proposal's objective of creating an effective and efficient tool for physical education and sports training supervision. Based on the strong foundation of this initial design, the application is expected to significantly contribute to improving the quality and effectiveness of the supervision and learning process in physical education and sports training in the future. The following is a summary of the results of the mobile-based learning tool.

3.4. Implementation

The final stage of this research was the implementation of the developed application. Implementation was carried out by conducting a trial of the physical education and sports training supervision application in the Banjarbaru city physical education, sports, and health (PJOK) teacher working group (KKG). User training was conducted to ensure teachers could use the application effectively. The results of the application implementation were also presented to the teachers.

Figure 5 shows the pretest results of teachers who worked on the questions before using the application. The results show that of the 60 teachers who participated in the pretest process, the lowest score obtained was 24, while the highest was 68, with the most scores of 62 obtained by 13 teachers. These results indicate that teachers have prior knowledge of educational supervision. This is consistent with the results obtained by teachers before receiving a complete explanation of the material, who were able to answer several questions given. Whether the correct results were obtained through logic or coincidence, some answers were certainly in accordance with their previous understanding [36].

Figure 6 shows the posttest results for teachers who have used the application. The posttest results show that out of 60 teachers who worked on the questions after using the application, 24 teachers obtained the highest score of 70, which is the highest score achieved. However, the posttest results obtained the lowest score of 34 for 2 teachers and 44 for 2 people. When viewed from the pretest and

posttest results, there was an increase in the scores achieved by teachers. This indicates a significant influence of using the AMJO application on teachers' understanding of educational supervision. This is in accordance with the provisions in the research methodology, where the difference in posttest and pretest scores can be used as a basis for the effect of treatment on improving the competencies or skills to be studied.

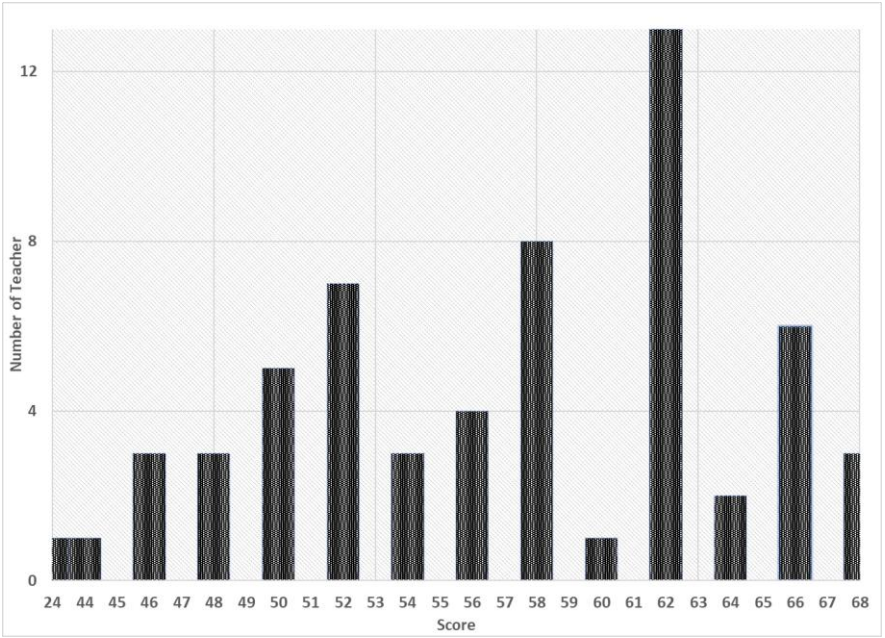

Fig. 5. Results from pretest.

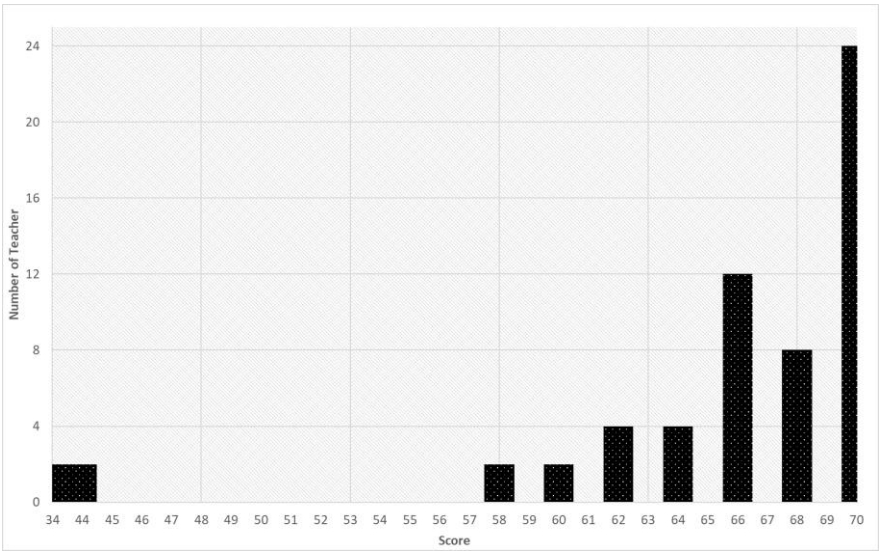

Fig. 6. Results from posttest after used application.

In addition, teachers were also given a questionnaire to gauge their responses to the applications they had used. This questionnaire aimed to gauge teacher-user responses to mobile-based learning media. There are 10 questions given regarding the use of the application, based on the results of the system usability scale (SUS) questionnaire completed by 60 respondents, an average score of 77 was obtained, with a maximum score of 100 given by 4 respondents. This score is included in the Grade B category, which is in the percentage range of values between 74 and 80.3. This score indicates that the system or product being evaluated has a good level of usability and is satisfactory for users. In the Grade B category, the product is considered to have above-average usability, with a fairly positive user experience. Users generally feel comfortable and are able to use the system easily. However, several small areas can still be improved to achieve a higher level of usability. This score reflects that the system is approaching excellent usability [37] but has not yet fully reached the highest level of usability, which is usually in the Grade A category [38]. Finally, this study adds new information regarding sports science and education, as reported elsewhere [39].

4. Conclusions

This study seeks to develop mobile-based learning media to effectively support the supervision of physical education and sports training. The research process consists of seven stages: (i) research planning, (ii) user needs analysis, (iii) application design, (iv) application development, (v) testing and evaluation, (vi) revision and refinement, and (vii) implementation and dissemination. The findings indicate that the development of mobile-based learning media can: examine current conditions and supervision needs in the field of physical education and sports training; determine the criteria and characteristics required for mobile-based learning media to support the supervision process; produce mobile-based learning media that align with the supervision needs of physical education and sports training; assess the effectiveness and efficiency of using mobile-based learning media in the supervision process; and identify potential obstacles and challenges encountered during the development and implementation of mobile-based learning media, along with strategies to address them. Furthermore, the development of this media enables an analysis of stakeholders' responses and perceptions (including teachers, coaches, and students) regarding the use of mobile-based learning media within the context of supervising physical education and sports training.

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