



Needs Analysis Study: Android-Based Multimedia Development to Increase Physical Education Learning Activeness

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Abstract. The application of physical education learning through digitalization has been experienced, including the use of Android-based learning, flipbooks, mobile learning, and other tech-enhanced methods. However, much of the research has focused on elementary school children and has not addressed small ball learning. Additionally, the aspect of active learning still requires further attention. To explore these issues more deeply, a needs analysis is necessary. The aim of this research is to conduct a needs analysis regarding the development of Android-based multimedia to enhance active physical education learning. The research method is exploratory descriptive, with participants being 10 physical education teachers. Data collection techniques include observation, interviews, and questionnaires. Data analysis techniques involve calculating percentages and creating reflective narratives. Quantitative results show that from 8 statements, all 10 teachers strongly agreed, resulting in a 100% agreement rate. Qualitatively, the teachers expressed support for the development of new learning models. It was concluded that the needs analysis from the teachers' perspective, through questionnaires and interviews, overwhelmingly agreed and supported the further development of an Android-based multimedia learning model to enhance active learning in junior high school physical education.

Keywords: Needs Analysis, Android-Based Learning, Physical Education, Active Learning

1 Introduction

The era of digitalization has penetrated the world of education [1], [2]. The integration of technology is crucial for making educational work more effective and efficient. For instance, the emergence of artificial intelligence, which can imitate human intelligence [3], and advancements in scientific writing tools such as Mendeley, Zotero, Endnote, Publish or Perish, and Lens.org [4], represent rapid progress in education. Similarly, in the field of physical education at secondary schools, there has been a shift from conventional methods to digital approaches.

Previous studies have highlighted various applications of technology in education, including Android-based learning through Lets Tech [5], mobile learning models for basketball [6], flipbook media for elementary students' movement patterns [7], ball learning media for basketball [8], application-based media for badminton [9], and Android-based physical education media to improve learning outcomes [10]. Additionally, Android-based media for healthy lifestyle education has been explored

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[11]. These studies illustrate significant advancements in integrating technology into education.

However, many of these studies have primarily focused on elementary school children and have not addressed small ball learning. Furthermore, the aspect of active learning still requires attention. Active learning is crucial for ensuring that students are engaged and receptive to instruction. To explore these issues more deeply, a needs analysis from the teacher's perspective is necessary, utilizing observational data, interviews, and questionnaires.

Searching for truth and innovation in scientific development is a hallmark of authentic academics [12]. Academics approach their work with a problem-solving mindset, seeking to address challenges with coherent logic. In this study, a needs analysis is conducted to understand the background of the problem and provide a well-reasoned solution.

The needs analysis aims to support the author's development research. The goal is to develop an Android-based multimedia learning tool to enhance active learning in physical education for junior high school students. To achieve this, a needs analysis is required for foundational development research. This analysis will help identify problems through empirical evidence, perspectives, and theoretical insights, leading to new research that can be shared with other academics and implemented in practice. In this context, the author conducted an exploratory needs analysis with physical education teachers as informants and respondents, employing both qualitative and quantitative methods. The aim is to uncover issues and gather information that will inform the development of an Android-based multimedia learning model designed to increase the engagement of junior high school students in physical education, particularly through small ball learning

2 Method

The research method employed is descriptive exploration [13]. Exploratory research is used to describe research results without making generalizable conclusions. Its primary aim is to explore cause-and-effect relationships and to investigate new knowledge related to a problem being studied. Specifically, this research aims to conduct a needs analysis by examining perceptions and the importance of developing an Android-based multimedia learning model to enhance effectiveness in physical education. The needs analysis is intended to strengthen research data and provide a basis for addressing the issues identified. Participants in this research included 10 physical education teachers from junior high schools. Data collection techniques involved interviews and questionnaires. The qualitative data analysis technique used is reflective narrative, while the quantitative data analysis technique involves calculating percentages with the aid of Excel [14]. The steps for this research are presented in the image below as follows:

3 Results

The results of this research present an overview of needs analysis using the questionnaire provided. The research results are described as follows:

Table 1. Results of needs analysis questionnaire distribution

No	Statement	Answer Choices	Answer	Percentage
1	Learning activeness is influenced by interesting learning	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
2	Active learning is established due to cooperative social interaction between teachers and students	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
3	The physical education learning model requires technology to get benefits, one of which is student activity	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
4	The physical education learning model requires modern technology to make the teacher's work easier	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
5	The era of digitalization of	Strongly agree	10	100%
		Agree	0	0%

	Android-based learning models is needed to gain efficiency in student learning activities	Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
6	In the era of digitalization, teachers need to update technology-based knowledge in order to gain new knowledge	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
7	The Android-based multimedia learning model to increase student learning activity has an urgency that needs to be developed	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%
8	The ease of accessibility using a smartphone is one of the advantages in the learning model paradigm that will be developed	Strongly agree	10	100%
		Agree	0	0%
		Neutral	0	0%
		Don't agree	0	0%
		Strongly disagree	0	0%

The research results indicated that 8 statements received a 100% agreement rate of "strongly agree" from the participants. This means that all 10 teachers who completed the questionnaire supported the development of an Android-based multimedia learning model to enhance the effectiveness of physical education learning for junior high school students.

Table 2. Qualitative analysis results from the needs analysis of 10 teachers

Summary of interview results
"Although there are already many learning models available, they may not have been widely disseminated. This means that some teachers may not have received optimal training, while others may possess strong teaching skills.

Therefore, the development of multimedia-based learning models, particularly those packaged for Android, is essential. Such models enable teachers to easily access resources via smartphones and internet connections. Additionally, during the development stage, including both small and large-scale testing with a substantial number of teachers and students is crucial. This ensures that the benefits of the development are widely experienced rather than limited to a few. It is hoped that this will support schools in more remote areas and provide technology-based updates and literacy to senior physical education teachers, allowing them to adapt to digital advancements.”

4 Discussion

Quantitative research results show that, out of 8 statements in the closed questionnaire, all 10 teachers strongly agreed, resulting in a 100% agreement rate. This indicates that the urgency of this research is highly significant for teachers. The goal is for the Android-based multimedia learning model to substantially enhance student learning activity once it is implemented.

Additionally, qualitative analysis revealed that optimal dissemination of development results is crucial. This involves including more samples, particularly for senior teachers, to ensure they can keep pace with digital advancements. It is the author's responsibility to address these needs effectively, ensuring that the expectations set during the needs analysis stage are met.

The concept of developing an Android-based multimedia learning model to increase students' active learning was initially derived from self-reflection on the significant shift from the traditional era to the digital era. This transition has impacted all areas of social life and communication, including physical education. Although physical education traditionally involves physical activity, incorporating technology-based learning is increasingly necessary.

From a teacher's perspective, there is a need for engaging and contemporary learning models. Such models will make teaching more effective and efficient. It is observed that physical education teachers are sometimes undervalued due to the perception that their classes, conducted once a week, are simpler compared to other subjects. However, physical education fosters social spirit, leadership, and cooperation, which are valuable beyond just physical activities.

Previous studies have highlighted that physical education extends beyond psychomotor skills to include cognitive and affective aspects [1], [15]. It also promotes leadership, problem-solving, independence, ethics, and positive attitudes [16]. Physical education emphasizes kinesthetic intelligence, which integrates physical and mental skills to produce coordinated movements [17]. Additionally, learning activities in physical education can enhance interpersonal intelligence through game-based approaches that foster cooperation and active participation among students.

Interpersonal intelligence, the ability to build effective relationships, is crucial for empathy and social interaction [17]. Research shows a correlation between kinesthetic intelligence, interpersonal intelligence, and intrapersonal intelligence with learning

outcomes in physical education [18]. Thus, physical education plays a vital role in students' overall development.

The multimedia development approach, incorporating technology-based learning, represents a positive step towards more advanced education. Technology has revitalized social interactions and education, despite some debate. It enhances student engagement and understanding when integrated into the learning process. Studies have shown that students are more enthusiastic and expressive, and better understand material when technology and innovative methods are used in teaching [19], [20].

5 Conclusion

Based on the results and discussion of the research, it can be concluded that the needs analysis, through quantitative questionnaire data, showed that all 10 teachers strongly agreed that developing an Android-based multimedia learning model is essential for increasing active learning in junior high school physical education. Additionally, qualitative analysis revealed that once the learning model is completed, it is crucial to ensure optimal dissemination and implementation. Teachers also emphasized the need for conducting both small and large-scale testing with a broader range of respondents to achieve the best results and fully address the needs of all stakeholders

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