



Development of Fitness Education Model Based on *FITT* Method in Electronic *Book* Physical Education Learners In Schools Intermediate First

Aep Guntur ^{*1}, Resty Gustiawati ², Febi Kurniawan ³

^{1,2,3}Singaperbangsa University Karawang: Faculty of Teacher Training and Education, Physical Education, Indonesia

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Abstract

Development of an electronic book-based fitness education model aims to improve the effectiveness of physical education learning in Junior High Schools by applying the FITT principle (Frequency, Intensity, Time, and Type). This model is designed to integrate electronic book technology in learning with the aim of increasing student motivation, participation, and overall physical fitness through the FITT approach. This study uses the ADDIE method (Analysis, Design, Development, Implementation, and Evaluation) to design, test, and evaluate the FITT-based learning model. At the analysis stage, a needs analysis and literature study were carried out, including sources from electronic books, related to challenges in physical education in junior high schools by considering the FITT principle. The design stage includes designing a learning model that combines the principles of FITT-based physical education with electronic book technology. At the development stage, a prototype of the FITT-based model was developed which was tested in several schools. The implementation stage involves the application of the FITT-based model in real learning, and the evaluation stage is carried out to assess the effectiveness, efficiency, and level of student acceptance of the FITT-based learning model that was developed. The results of the study indicate that the electronic book-based fitness education model using the FITT approach can increase student involvement in physical activities, as well as provide a positive contribution to improving physical fitness. This model also shows potential for wider application in schools as part of innovation in FITT-based physical education learning.

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*Corresponding email: aepnugraha01@guru.smp.belajar.id

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INTRODUCTION

Physical Education at the level School Intermediate First (junior high school) has experience development significant in a number of year Lastly , with the current focus more holistic and encompassing various aspect health and fitness (Saputra et al., 2021) . Changes This in line with shift paradigm that emphasizes importance No only increase ability physique students , but also provide understanding deep about comprehensive health . Physical Education Teachers the more adopt method interactive and problem - based learning students , where various activity like games , exercises physical , as well as discussion become part important in the learning process teaching . This is aiming For push participation active student as well as grow awareness will importance guard fitness and health body in a way overall (Wibowo, 2020) .

along with progress technology , education now the more adapt with utilise various digital devices . However , in the field of Physical Education , the application of technology This Not yet fully utilized optimally (Farida et al., 2014) . Learning fitness Still Lots done through method conventional , such as look at face and book print , which sometimes not enough interesting for student digital generation is more familiar with use device such as smartphones and tablets. Conditions This potential lower interest student in follow Physical Education lessons , which in turn impact on low level fitness physique student .

Various study show existence decline activity physical among junior high school students , which is caused by the increase use technology , pattern undereating healthy , and low awareness will importance activity physical . Remembering adolescence is phase important in development physical and mental, very crucial For to plant habit life Healthy since early . Therefore that , Physical Education learning need adapt with integrate innovation technology For increase effectiveness and power pull learning . One of the proposed solution is development of learning media digital-based , such as the FITT Electronic Fitness E-Book , which combines material theoretical with digital training programs . Innovation This expected can increase involvement student in activity physical and supportive achievement objective more Physical Education learning holistic and relevant with need Today 's Students (Syamsul et al., 2020) .

With implementation approach more learning interactive and supported technology , it is expected student No only to obtain knowledge about importance fitness and style life healthy , but also develop skills social , leadership , and cooperation the team that will beneficial for life students in the future (Muhtar & Lengkana, 2021) . Technology integration in Physical Education learning expected capable become bridge For create experience learn more interesting and meaningful for students , as well as give impact positive

for health physical and mental condition of students .

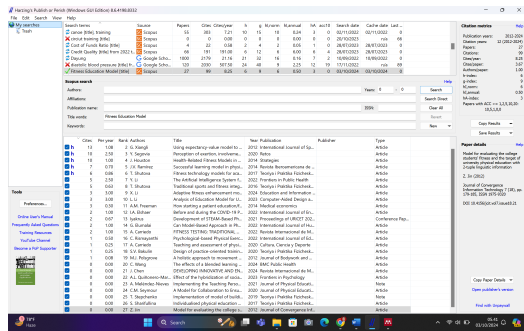


Figure1. 1 Analysis Publish or Parish

From the Screening Results publication study with title *Fitness Education Model* on publish or perish application obtained 27 articles from start 2012-2024 indexed by Scopus. Research latest 2024 with title *The effects of a blended learning model on the physical fitness of Chinese university students: a cluster randomized controlled trial in basketball education* (Wang et al., 2024) and articles with amount citation as many as 13 citations with title *Using expectancy-value model to examine students' physical activity engagement and cardiovascular fitness in physical education* (Xiangli et al., 2012) .

Physical Education Learning in Schools Intermediate First (junior high school) has experience change significant with a more approach innovative and focused on improvement participation as well as fitness students . Research previous show that various learning models based on game has developed For make activity physique more interesting for students . For example , Rejeki et al. (2024) developed a learning model based on game For student Proven Elementary School effective in increase participation student through a fun and interactive approach (Rejeki et al., 2024) .

Ro'is and Fahturohzis (2023) also proposed a training model fitness based on game snake stairs , using method research and development (R&D). Research results show that this model succeed increase

motivation student in participate in activities physique through element gamification , which is considered more interesting compared to method conventional (Ro'is & Fahturohzis, 2023)

Furthermore , Rafi et al. (2022) designed a learning model fitness physical interactive multimedia based For student School Senior High School (SMA) during COVID-19 pandemic . With utilise digital technology , this model get response positive , indicating effectiveness of multimedia in support learning distance Far (Rafi et al., 2022) .

For Junior High School Students , Fitness E-Book Model Fitt Electronics developed as solution learning fitness physical based on technology . This media load training program interactive and physical accessed in a way independent , purposeful For increase fitness student as well as Motivate student For participate active in activity physical . Research This reflect effort For answer modern challenges in learning fitness physical with a more approach flexible and adaptive to need student .

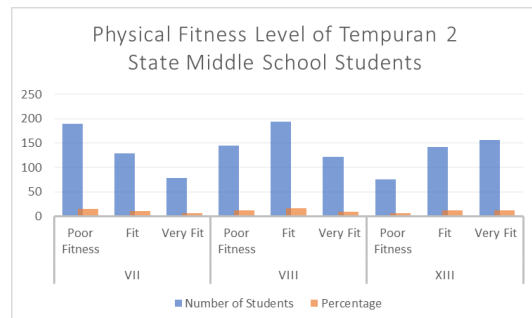


Figure 1. 2Fitness Levels Physical Students of State Middle School 2 Tempuran

The results of the analysis of physical fitness levels of students at SMP Negeri 2 Tempuran showed significant variations between classes and fitness categories. In grade VII, the majority of students, namely 189 students (15.37%), were in the less fit category, while only 10.49% (129 students) were categorized as fit and

6.34% (78 students) were very fit. This indicates that students at this level generally have not achieved optimal fitness, possibly due to ongoing adaptation to physical activity and younger age factors. In grade VIII, improvements were seen with a decrease in the number of less fit students to 11.79% (145 students), while the number of fit students increased to 15.77% (194 students) and very fit students reached 9.92% (122 students). This increase may be due to better adaptation of students' bodies and greater experience in participating in fitness programs. In grade IX, improvements were even more pronounced with only 6.10% (75 students) being less fit, 11.54% (142 students) being fit, and 12.68% (156 students) being very fit. This significant increase in the very fit category suggests that older and final year students tend to have better fitness levels, likely due to more intense exercise routines and increased awareness of the importance of physical fitness. Overall, these data show an increase in physical fitness with age and grade level, underscoring the importance of tailoring fitness programs to the needs and abilities of students at each grade level.

Education plays a crucial role in shaping individuals who are ready to face life's challenges, with teachers as the main drivers in developing students' knowledge, skills, and character. Through the process of interaction between students and the environment, education not only transfers information but also instills understanding and skills that are useful throughout life (Herlina et al., 2022; Kurniawan et al., 2024). Learning occurs through direct experience and social interaction, and is influenced by individual motivation, both internally and externally (Artinta & Fauziah, 2021; Pandikar, 2020; Sutanah et al., 2022). In the context of physical education, learning not only focuses on improving motor skills and physical fitness but also contributes to character

development, such as cooperation and responsibility (Mustafa & Dwiyojo, 2020; Purba et al., 2022; Sudrajat & Hariati, 2021). This shows that physical education is an integral part of holistic education that shapes students into a physically, mentally, and emotionally healthy generation, and prepares students to live an active and meaningful life (Bangun, 2016; Burhaein, 2017; Candra et al., 2023).

Fitness is optimal condition of body and mind that allows somebody For do various activity daily with efficient without experience fatigue excessive (Lengkana & Muhtar, 2021). Concept fitness covering ability physique body For adapt to demands activity long -lasting physical, such as routine work or activity sports, as well as backup sufficient energy For face need sudden (Buanasita, 2022). Fitness No only question appearance or weight, but more to balance between ability body For do functions physique in a way maximum and maintenance health term long.

Fitness consists of from a number of component main, namely Power stand cardiovascular, strength muscle, power stand muscles, flexibility, and composition body (Bayu et al., 2021). Endurance cardiovascular refers to the ability heart and lungs For to distribute oxygen in a way efficient to all over body during activity prolonged physical. A person who has Power stand good cardiovascular can do activity like run or swim in long time without fast feel tired (Adi & Soenyoto, 2023). Strength muscle is ability muscle For produce strength in time short, for example For lift or push burden heavy (Hermanzoni, 2020).

Physical education and the FITT concept have deep connection in form a training program effective physical For students. In education physical, teachers use FITT principles (*Frequency, Intensity, Time, and Type*) For to design activity structured and supportive physical

development fitness student in a way comprehensive . Concept This help student understand How do exercise with a measurable and safe way , and introduce habit life healthy that can applied in life daily (Rumawatine, 2024) .

Element frequency in The FITT concept refers to how much often activity physique done in a week . Physical education usually held several times in a week , consistent with principle frequency in exercise physical . This helps student to form consistent routine , so that student can build Power endurance and strength in a way gradually . With scheduled practice , students get understanding about importance consistency in exercising For reach benefit optimal fitness (Muhtar & Lengkana, 2021) .

METHODS

Study This use method development ADDIE which consists of five stages , namely Analysis, Design, Development, Implementation, and Evaluation . At this stage Analysis (Analysis) , is carried out identification need through survey and interview with teachers and student For understand challenge in learning fitness physical education in junior high school. Analysis This covers review curriculum and implementation FITT method (Frequency, Intensity, Time, Type), which aims For adapt material with need student in increase fitness physique students . Next , the next stage Design focused on planning content and structure of the e-book that will be developed . The design includes election material about draft fitness , guide exercise physique based on FITT method , as well as determination Attractive and interactive

e-book display , complete with video tutorials and infographics . Stages next is Development (Development) , where the e-book starts built with integrate various material like text , images , and exercise videos . After the e-book is finished developed , tested early in a group small students and teachers to to obtain bait come back about quality e-book content and functionality .

At the stage Implementation (Implementation) , e-book starts used in the process of learning Physical Education in class . The teacher receives training about method using e-books as well implementation FITT method , so that student can follow a structured training program with digital guide . During implementation , monitoring is carried out for ensure use of e-books appropriately with objective learning and giving mentoring If required . Stage final is Evaluation (Evaluation) that was carried out For evaluate the effectiveness of e-books in increase fitness physique students and quality learning in a way Overall . Evaluation shared into two parts , namely evaluation formative activities carried out during development For repair deficiencies found , and evaluation summative conducted after use of e-books for evaluate the impact to results learning and level fitness student through test fitness , questionnaires , and interview . With application of the ADDIE model, research This aiming produce effective e-books in teach draft fitness physical based on FITT method and improve participation student in

Physical Education learning in junior high school. .

Participants

Participants involved include students, Physical Education teachers, and material experts. Students who are used as participants are junior high school students from various grade levels (VII, VIII, and IX) who are randomly selected to represent the wider population. Sampling was carried out using purposive sampling, taking into account students who are diverse in terms of physical fitness levels, participation in physical activities, and access to electronic devices used in learning. Physical Education teachers are also the main participants in this study, because students have an important role in the process of implementing FITT-based e-books in the classroom. Teachers are selected based on their teaching experience and students' knowledge of physical fitness, so they can provide relevant feedback on the effectiveness of the learning model developed. In addition, this study also involves material experts consisting of physical education experts, fitness experts, and digital learning media experts. Students provide assessments and input regarding the quality of e-book content, the accuracy of FITT method information, and the design and functionality of the e-book to ensure that the resulting product is in accordance with learning needs and can be implemented effectively in junior high schools. Through collaboration between students, teachers, and experts, this study aims to develop a comprehensive

learning model that is appropriate to the conditions of Physical Education learning in junior high schools .

Sampling Procedures

The sampling procedure was carried out using purposive sampling technique . This technique was chosen to ensure that the participants involved had characteristics that matched the research needs, namely junior high school students with various grade levels (VII, VIII, and IX) who had experience in taking Physical Education lessons. The selection of schools was carried out using stratified sampling to cover various types of schools, both public and private, that had structured Physical Education programs. After the schools were selected, the students who would be the samples were selected based on certain criteria, such as willingness to participate, varying levels of fitness (low, medium, high), and access to electronic devices (such as smartphones or tablets) needed for using e-books. In addition, the Physical Education teachers involved in this study were also selected purposively, with the criteria of a minimum of five years of teaching experience and having a good understanding of physical fitness methods, especially the FITT method. The use of purposive sampling aims to obtain representative and relevant samples, so that the results of the study can describe the effectiveness of the learning model developed and its impact on improving the physical fitness of junior high school students.

Materials and Apparatus

A number of materials and apparatus used For support the development and implementation process . The main materials developed is an interactive e-book based on FITT method (Frequency, Intensity, Time, Type), which contains guide exercise fitness physical , video tutorials, infographics , and explanations theory about FITT concept . This e-book designed use device soft development of digital media such as Canva and Adobe InDesign For visual display , as well as H5P and Adobe Captivate For make content interactive that can accessed through device electronic such as smartphones, tablets, or laptops. In addition , learning platforms like Google Classroom or Moodle used For upload and distribute e-books to student as well as facilitate communication between teachers and students in the learning process .

Procedures

ADDIE development model steps (Analysis, Design, Development, Implementation, Evaluation). The Analysis stage involves identifying the needs of students and teachers in physical fitness learning, including mapping relevant materials and effective learning methods. In the Design stage , the structure of the e-book is designed based on the FITT method, including the frequency, intensity, time, and type of exercise that is appropriate for junior high school students, as well as the creation of interactive learning scenarios. The Development stage includes creating e-

book content using various media such as video tutorials, infographics, and interactive tests. After that, the e-book is tested at the Implementation stage , where a small-scale trial is conducted involving students and teachers to observe the effectiveness of the learning model and collect feedback. Finally, at the Evaluation stage , implementation data is analyzed to assess the success of the e-book in improving student fitness and learning motivation, and revisions are made based on input to improve the final product before being distributed more widely.

Design or Data Analysis

The development of a Fitness Education Model Based on the FITT Method in an Electronic Book (e-book) of Physical Education Learning in Junior High Schools (SMP) involves the collection and analysis of relevant data to design effective and interactive content. This process includes analyzing the needs of students and teachers, identifying indicators of success, and determining learning strategies that are in accordance with the FITT principles (Frequency, Intensity, Time, Type). Data is collected through surveys or interviews with teachers and students to determine the challenges faced in fitness learning. The results of the analysis are used to design learning materials that are integrated with technology, such as videos, infographics, and interactive quizzes, which aim to improve understanding and application of fitness concepts in a practical and enjoyable way. Data evaluation is carried

out periodically to ensure that the developed model can improve student learning and fitness outcomes in schools.

RESULT

Result of Development of Fitness Education Model Based on the FITT Method in Electronic Books (e-books) for Physical Education Learning in Schools Intermediate First (junior high school) shows impact positive Good from aspect understanding theory fitness and implementation more practice good among students . E-book designed in a way interactive and based technology This has make it easier student in understand principle base fitness through a more visual and fun approach . With use FITT method (Frequency , Intensity , Time, Type), this e-book give clear guidance about How arrange exercise physique with consider four element important thing to do be noticed in fitness . Evaluation results beginning show that student own better understanding Good about arrangement exercise after using this e-book , especially in matter adjustment exercise based on ability individual student .

In addition , the use of Features interactive such as video tutorials, exercises physical that can done at home or at school , and quiz For test understanding students , have proven effective in increase involvement students . Students more motivated For follow an exercise and study program in a way independent , because student feel more empowered For organize and track development fitness student itself .

Features the make material learning more interesting and easy understood , which in turn increase participation student in Physical Education learning .

Response from the teacher is also enough positive , students disclose that this e-book make it easier student in give more explanation structured and managed learning in a way more efficient . Teachers can utilise various learning media in e-book for give appropriate material with need students , so that learning No monotonous and more focus on achievement results optimal learning . However , the challenges that arise is limitations access technology in some school , which can hinder use of this e-book in a way maximum . Schools that have infrastructure adequate technology show more results Good in implementation of this model , while school with limitations device electronic experience obstacle in distribution material .

In terms of improvement fitness physical , results observation show that students who use this e-book more routinely active in do practice and show improvement significant fitness . Students more aware will importance guard health body and able apply FITT principle in activity physique student daily . Based on the data obtained from quizzes and tests practice , almost all students who use this e-book show better understanding deep about ways appropriate exercise with need body students . In Overall , development of educational models fitness based on FITT method in this e-book proven effective in

increase quality Physical Education learning in junior high school, although There is a number of challenge related accessibility and training technology needed be noticed For development more carry on . .

DISCUSSION

The Development of a Fitness Education Model Based on the FITT Method in an Electronic Book (e-book) for Physical Education Learning in Junior High Schools (SMP) shows that the integration of technology in physical education offers great potential to increase student engagement and understanding. The use of the FITT method (Frequency, Intensity, Time, Type) adapted in digital format provides a more interactive and flexible learning experience. Students can access learning materials anytime and anywhere, allowing students to learn at their own pace without being limited by class time. E-books designed with multimedia elements such as videos, animations, and interactive quizzes help students understand fitness concepts in a more interesting and digestible way. Through these features, students not only gain theories about fitness, but can also directly apply them in daily physical exercise, in accordance with the FITT principles taught.

However, although the use of e-books has been shown to improve students' understanding of fitness, a major challenge remains in the issue of access to technology. In some schools, especially those in areas with limited technological

infrastructure, not all students can make maximum use of e-books. This problem is related to the limited availability of devices such as computers or tablets that support the use of e-books, as well as the stability of internet access needed to download materials and videos. This certainly affects the effectiveness of the implementation of this e-book-based fitness education model. Therefore, further efforts are needed to ensure that every student has equal access to technology, both by providing adequate devices and by creating other solutions, such as providing offline materials or group-based learning.

In addition, the implementation of this model also requires special training for teachers so that students can utilize e-books effectively in the teaching process. Teachers need to be equipped with the knowledge and skills to integrate this technology into the Physical Education curriculum, so that the use of e-books can run smoothly and in accordance with learning objectives. Without adequate training, teachers may have difficulty optimizing the features in e-books, which can ultimately reduce the benefits obtained by students. With proper training, teachers can facilitate students in accessing and utilizing e-books to improve student fitness, as well as ensuring that learning remains structured and directed.

Overall, the FITT method-based fitness education model in e-books has great potential to enrich Physical Education learning in junior high schools. Although there are challenges related to

technology access and teaching readiness, the evaluation results show that the use of this e-book can increase students' motivation, participation, and understanding of fitness. This e-book also allows students to be more independent in planning and implementing fitness exercises, and provides students with deeper knowledge on how to design exercise programs that are appropriate to their physical conditions. Therefore, with improvements in the areas of technology access and teacher training, this model can be implemented more widely and effectively in various schools.

CONCLUSION

The Development of a Fitness Education Model Based on the FITT Method in an Electronic Book (e-book) for Physical Education Learning in Junior High Schools (SMP) shows that the integration of technology in fitness learning has great potential to improve the quality of physical education at the junior high school level. The application of the FITT method in an e-book allows students to learn and apply fitness principles in a more structured and interesting way, with the support of various interactive elements such as videos, exercises, and quizzes that increase student understanding and engagement. This e-book also provides flexibility for students to learn according to their own rhythm, and makes it easier for teachers to manage and monitor student learning progress. However, challenges in terms of technology access

and teacher training need to be overcome so that this model can be implemented optimally in all schools. Overall, this e-book-based fitness education model has great potential to improve students' understanding of fitness and motivate students to adopt a healthy lifestyle, with the hope that it can be implemented more widely in various schools in Indonesia.

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