

Development of ICT TPACK-oriented learning media for gymnastics material of Grade VIII Junior High School students

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ABSTRACT

This study aims to develop an ICT-TPACK-oriented learning video for grade VIII students for forward and back-roll tasks. This research and development study uses the ADDIE model. The study population consisted of 2,582 students with 501 samples of grade VIII from 8 public junior high schools in the Buleleng District. Closed questionnaires in the form of google forms and motion task validation sheets were used as instruments with quantitative-qualitative descriptive analysis techniques. The results showed 1) 93% of students needed motion task videos, and 2) content expert scores on motion tasks reached 72 out of 75. In conclusion, 1) PE motion task videos on forward and back-roll material were needed by grade VIII students, and 2) the forward and back-roll tasks were valid. The motion tasks designed can be implemented by PE Junior High School teachers in Buleleng District.

Keywords: forward roll; back roll; ICT TPACK

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INTRODUCTION

Education shapes humans to be able to carry out their roles in people's lives, so education begins with the formation of a healthy character (Mashuri & Pratama, 2019). Education is a learning that is obtained by every individual, from kindergarten, elementary, junior high, high school, or equivalent, to university. Education is a shared awareness that humans carry out throughout their lives to become a means of transmitting and transforming both values and knowledge (Sudrajat, 2011). No exception, education develops at the junior high school level when students experience physical and mental development, especially in PE subjects.

As one of the lessons in junior high school, the motion task in PE also plays a crucial role. PE teachers need to apply motion tasks to students' characteristics. PE plays an important role in shaping human character through pleasurable physical activity (Mashuri, 2019, 2022). Movement tasks that are said to be appropriate for students are motion tasks that follow the characteristics and needs, carried out in stages from easy to difficult, from simple to complex, while maintaining the safety of students. The use of technology and traditional

games can be used in PE learning (Mashuri, 2022).

Practical movement tasks can help the development of the student's body and also affect the development of students' thinking, physical and skill patterns (Artanayasa, Suwiwa, & Mashuri, 2023; Herpandika, Mashuri, Putra, & Agung, 2020; Pasaribu & Mashuri, 2019). The physical quality of students can be improved by floor exercise because it can affect students' performance to carry out activities more optimally (Sudjana, 2016). This can be carried out in floor exercise material, forward roll, and back roll material. Forward roll, also known as front roll, is a rolling movement or rolling the body forward with a rounded shape like a wheel. The front bolster is one of the agility exercises without using a floor or floor exercise tool (Permatasari, Bambang, & Rustiadi, 2012) To perform an excellent forward roll, students must improve the coordination of energy from each part of the body and increase their courage (Sumarni, 2017). How to do a forward roll is explained in more detail as follows.

1. Do a squatting position facing the mat and put your palms on the mat.
2. Lift your hips until your knees are straight and your heels are lifted. Put your head between your hands with your elbows slightly bent.
3. Roll the body starting from the shoulders, back, waist, and back of the pelvis. Both hands quickly hug the legs when rolling until the heels are close to the thighs.
4. The final movement of the front roll back in a squat position, with both hands holding the knees. 1. While the back roll is a form of physical activity rich in movement, quite complicated and complex (Suharyanto, 2015).

How to do the back roll movement is as follows. 1. In principle, it is the same as the forward rolling motion. The only difference is the direction backward. 2. This movement can be done in a ready position (standing), followed by both legs squatting and then lowering your back to the mat to start rolling. Meanwhile, when rolling, let both thighs stay close to the chest so the body can still form a circle. 3. Then, the back roll movement ends with a squatting position and then continues with standing.

The physical education learning process must be able to present teaching materials as the knowledge that is implemented by students in everyday life so physical education requires a creative approach to the learning process (Mashuri, Mappaompo, Gunarto, & Herpandika, 2021). In the PE learning process, the media used for movement tasks is also very needed to support the classroom learning process. This is related to the learning process

in the 21st-century era that applies ICT (Information and Communication Technology). The rapid development of ICT in the world is undoubtedly a huge potential to improve the quality of education. In addition, teachers are required to be more creative, innovative, and broad-minded to improve the quality of process activities. Moreover, during a pandemic, technology has a significant role in the world of education. Many teachers use video tutorial media in classroom learning, but sometimes this is ineffective. TPACK is also crucial for teachers concerning ICT because as technology develops, teachers must be able to use technology more in the teaching and learning process. This, of course, can help create learning media that can help the learning process and be more interesting so that students do not feel bored with the previous learning.

Therefore, ICT TPACK in the learning process is vital in improving learning to be more effective and efficient. ICT TPACK is expected to be able to help teachers in the learning process in the classroom using technology, as well as make learning more interactive for students, which is undoubtedly a solution to overcome student boredom because teachers can vary learning activities in class using technology. Several studies evidence this, one of which is a study entitled "Utilization of ICT Learning Media as Student Learning Activities at SMP Negeri Aceh Tamiang." It is stated that using and applying media can improve student learning outcomes. In addition, the research entitled "Development of ICT-Based PE Learning Media in Junior High Schools" also states that the trial of ICT-based learning models is effective in the learning process with an average score of 4,349 (scale 5), which is categorized as "Very Good." These data reflect that using ICT plays a vital role in the quality of learning.

In response to this, observations and interviews were carried out with one of the PE teachers at the Senior High School in Singaraja. The results of interviews and observations showed that in PE learning, especially the floor exercise material, it was seen that the movement tasks given were still monotonous, so students tended to be less enthusiastic in the learning process. This is because, in the floor exercise material, the teacher does not yet have learning media in the form of motion tasks; so far, the teacher only uses video tutorial media. In addition, it can be seen that students are still afraid to do floor exercises, even though the teacher has given a video tutorial. This is due to students' lack of understanding regarding how to carry out each movement. Therefore, video tutorials containing motion tasks have a high urgency to be developed to facilitate the learning process and students' understanding of the given motion tasks.

METHODS

This research is a research and development (R&D). Development research is a method to produce a specific product and test its effectiveness (Hasana, Sugihartono, & Raibowo, 2021). Therefore, this study aims to develop media in the form of ICT TPACK-oriented learning video for floor gymnastics for students of SMP class VIII in Singaraja. In addition, the learning videos developed are also equipped with movement assignments adapted to grade 8th students' characteristics. This study uses the ADDIE development model, which consists of five steps, namely: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation (evaluation).

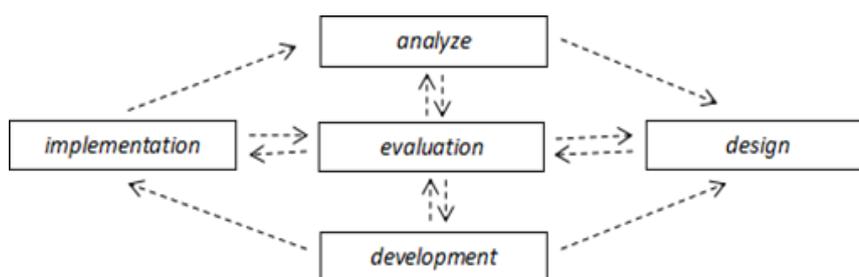


Fig. 1 The Steps of the ADDIE Model (Cahyadi, 2019)

In the analysis phase, three product development analyses were carried out. First, an analysis of students' and teachers' needs (needs assessment) related to PE learning for grade 8th. Second, an analysis of the curriculum (core competencies, basic competencies, and materials) for grade 8th of Physical Education material. Third, analyzing PE task analysis for grade 8th students. A needs analysis was carried out by distributing closed questionnaires in the form of Google Forms to PE teachers and grade 8th students. The second stage is the design stage. There are three activities in this stage, namely: 1) formulating specific, measurable, applicable, and realistic (SMAR) learning objectives, 2) compiling motion tasks based on the formulated learning objectives, and 3) designing storyboards and flowcharts.

At the development stage, learning media videos began to be developed based on storyboards and flowcharts that had been previously designed. Activities at this stage consist of 1) video recording, 2) audio recording, 3) video editing, 4) content expert testing, media/design expert testing, and PE practitioners. Then, at the implementation stage, individual and small group trials were carried out with 15 students. In the last stage, evaluation is carried out to determine the effectiveness of the media that has been created.

This research is a qualitative-quantitative descriptive study. Data or information obtained from questionnaires, interviews, and observations were analyzed qualitatively. Meanwhile, the data obtained in the form of numbers or scores from the results of the media assessment were analyzed quantitatively in descriptive percentages. The scoring is done by assessing each instrument with a Maximum Instrument Score (SMI) of 5 (five). The formula used to calculate the percentage of each subject is as follows (Tegeh & Kirna, 2013).

$$\text{Percentage} \quad \frac{\sum x}{SMI} \times 100 \frac{\sum x}{SMI} \times 100\%$$

Description:

\sum Score = Total score

SMI = Ideal Maximum Score

Furthermore, to calculate the percentage of all subjects, used the formula:

$$\text{Percentage} = F : N$$

Description:

F = Total percentage of subjects

N = Number of subjects

RESULTS AND DISCUSSION

Results

This study uses the ADDIE development model, which consists of five stages of implementation, namely, 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation. However, this article focuses on the analysis and design stages only.

At the analysis stage, it is known that PE teachers have implemented and provided learning media in video tutorials. However, the motion task given to students is still monotonous. So that PE teachers need the realization of video tutorial media equipped with motion task videos for grade 8th junior high school students. Of the 501 grade 8th students in all State Junior High Schools in Singaraja, 93% said they agreed to make a floor exercise learning video media equipped with movement assignments. In addition, an analysis was also carried out on the curriculum, Core Competencies, Basic Competencies, learning objectives, and learning materials. This is done so that the video that will be designed can be used following the applicable curriculum. It is known that the curriculum used in Junior High School Singaraja, especially grade 8th, is the Independent Learning Curriculum or Merdeka Belajar. As for the material obtained, the material for floor exercises is forward rolls and back rolls.

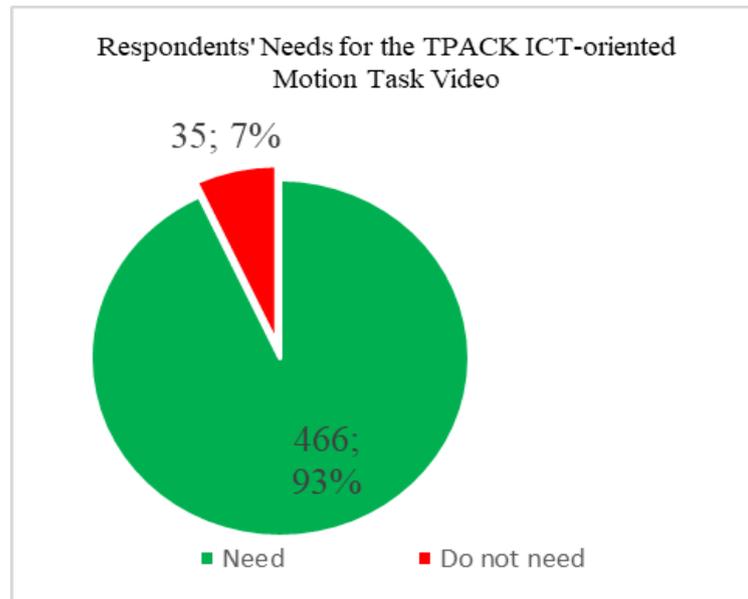


Fig. 2 Percentage of Respondents' Needs for ICT-TPACK Oriented Motion Task Video

In the design stage, four activities have been carried out. First, formulate learning objectives per the core competencies and basic competencies from the floor exercise material rolling forwards and backward for grade 8th students. Three learning objectives are arranged in the cognitive domain related to students' knowledge of the material being studied. Then, the psychomotor domain relates to the ability of students to practice movement tasks; the last is the affective domain, which is related to the attitudes that students must show in learning. Second, after the learning objectives have been formulated, it is continued by compiling movement tasks according to three stages of difficulty, namely easy motion tasks, moderate motion tasks, and complex motion tasks. Then in the third activity, designing storyboards and flowcharts, and in the last activity, a content expert test, media/design expert test, and PE practitioners were carried out.

The results of the review of learning media by content experts and PE practitioners obtained a percentage of 96% and 93%, with an average of 95%, which was categorized in the very good category. While the results of the reviews by media/design experts and PE practitioners obtained percentage results of 96% and 95%, with an average of 96% belonging to the very good category.

At the implementation stage, individual and small group trials were carried out. Individual trials were carried out with five students in grade 8th before carrying out trials in small groups. Meanwhile, the small group trial involved fifteen students consisting of ten male students and five female students. After carrying out the trial, students were given a

Formative Class Evaluation (FCE) questionnaire sheet with a score range of 3 for Yes, 2 for Do not Know, and 1 for No. The results of the FCE can be seen in the following table.

Table 1. Male Students Small Group Trial Assessment

Students	1	2	3	4	5	6	7	8	9	Average
Student 1	3	3	3	3	3	3	3	3	3	3,00
Student 2	3	3	3	3	3	3	3	3	3	3,00
Student 3	3	3	3	3	3	3	3	3	3	3,00
Student 6	3	3	3	3	3	3	3	3	3	3,00
Student 7	3	3	3	3	3	3	3	3	3	3,00
Student 9	3	3	3	3	3	3	3	3	3	3,00
Student 11	3	3	3	3	3	3	3	3	3	3,00
Student 12	3	3	3	3	3	3	3	3	3	3,00
Student 15	3	3	3	3	3	3	3	3	3	3,00
Average	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00

Table 2. Female Students Small Group Trial Assessment

Students	1	2	3	4	5	6	7	8	9	Average
Student 4	3	3	3	3	3	3	3	3	3	3,00
Student 5	3	3	3	3	3	3	3	3	3	3,00
Student 8	3	3	3	3	3	3	3	3	3	3,00
Student 13	3	3	3	3	3	3	3	3	3	3,00
Student 14	3	3	3	3	3	3	3	3	3	3,00
Average	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00

Table 3. Overall Standard Score of FCE

Value	Score of FCE	Category
5	2,77-3,00	Very Good
4	2,58-2,76	Good
3	2,34-2,57	Average
2	2,15-2,33	Poor
1	Under 2,15	Very Poor

Discussion

The results of the evaluation of the movement task using Formative Class Evaluation or FCE on the forward and backward roll task video obtained a score of 3.00, which includes the qualification "very good." The ICT-TPACK-based learning video media products and motion tasks showed "very good" results. This is also evidenced by several development studies which show that the results of valid research products can be implemented in learning. The demands of the education system for contemporary technology, all educators must master the competence to integrate information and communication technology (ICT) into teaching and learning practices in the future (Kihzoza, Zlotnikova, Bada, & Kalegele, 2016). The impact of the TPACK model is related to planning the use of technology and redesigning learning tasks. The challenges are a lack of infrastructure, enthusiasm for change, and an underload on pedagogical ICT applications. Therefore, the government and stakeholders are working on the integration of ICT in education by considering the opportunities and challenges faced by educators.

The ICT-TPACK model has a good impact on the learning and teaching process of physical education. The results of the research prove this. The ICT-TPACK model focuses on the assumption that the effective use of ICT in teaching must prepare human resources by training in technological, content, and pedagogical knowledge. Therefore training, workshops, or teacher training education programs must develop and apply technological, content, and pedagogical knowledge. However, it should also be noted that findings from various countries (Spain, Argentina, Colombia, Dominican Republic, and Venezuela) show that pedagogical aspects and content are often forgotten due to the focus on technology applications (Cabero & Barroso, 2016).

ICT-TPACK requires the readiness of physical education educators. In general, at present, physical education educators are generally technology literate but they have a skeptical attitude towards the integration of technology and require additional training. PE educators and prospective PE educators value technology as a good development and a valuable partner in achieving learning outcomes but they do not feel ready for physical education, so it becomes a contextual barrier (Daum & Ervin-Kassab, 2023). Therefore teacher educators and professional development programs need to train teachers and professional development programs need to train future teachers and integrate technology in meaningful ways.

The development of the ICT-TPACK learning model is adapted to the needs of PE teachers in gymnastics material. Development using the ADDIE method is not new but is effective in developing learning models. Research conducted by [Sokheh \(2018\)](#) under the title "Development of Learning Video Media with the ADDIE Model for Basketball Passing Materials" and research conducted by [Maulana, Wahjoedi, & Suwiwa \(2016\)](#) were declared valid from the results of media validation, content, and design as well as individual, small group and field test results so that they can be used and applied in learning. This research proves the effectiveness of the development model used.

In addition, the product of this research is in line with the TPACK component in terms of subject matter, pedagogy, and technology ([Sukmawati & Suharno, 2022](#)). It can be concluded that class VIII students and physical education teachers in the city of Singaraja need learning media in the form of motion task learning videos. Based on the validity and small group trial results, the motion task video obtained the "very good" category, which means that the motion task video was suitable for grade 8th students.

CONCLUSION

Based on the analysis and discussion results, it can be concluded that class VIII students and physical education teachers in the city of Singaraja need learning media in the form of motion task learning videos. Based on the validity and small group trial results, the motion task video obtained the "very good" category, which means that the motion task video was suitable for grade 8th students.

Suggestions from this study are addressed to teachers, students, and other researchers. Teachers, especially PE teachers, are expected to be able to apply these motion task videos to support the learning process so that learning materials can be adequately conveyed to students. Students

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