

## Implementation of Technology Pedagogy and Content Knowledge (TPACK) Based Learning in State Senior High School Sports Teachers in Jambi City

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**Abstract:** Physical Education, Sports, and Health (PJOK) plays an important role in fostering physical abilities and healthy lifestyles of students. However, the implementation of Technology Pedagogy and Content Knowledge (TPACK)-based learning in PJOK teachers is still limited, especially in utilizing technology to support the learning process. This study aims to describe the implementation of TPACK-based learning in PJOK subjects for sports teachers in Senior High Schools throughout Jambi City. This study used a quantitative descriptive survey method with 47 senior high school sports teachers in Jambi City as samples. Data collection was carried out through a questionnaire covering seven TPACK indicators. The data obtained were analyzed using descriptive statistics to measure the level of TPACK implementation. The results showed that the level of TPACK implementation in PJOK learning was in the good category with an achievement of 75%. Teachers have generally integrated technology in learning, although there are several obstacles in maximizing the use of more interactive technology. The implementation of TPACK in PJOK learning in Senior High Schools throughout Jambi City is classified as good, but still needs to be improved, especially in the use of technology innovatively to improve learning effectiveness. The results of this study can be a reference for further development of TPACK competencies for PJOK teachers.

**Keywords:** TPACK, Physical Education, Sports Teacher, Educational Technology

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## INTRODUCTION

Learning is a systematic and systematic process or activity, which is interactive and communicative between teachers and students, learning resources and the environment (Arifin, 2013). In this case, teachers must be able to create interactions with students in order to create active and meaningful learning. Based on Law No. 14 of 2005 concerning teachers and lecturers, it states that teachers must have four competencies, namely pedagogical, personality, social, and professional competencies.

Teachers when carrying out their duties as educators must have competence. As stated in the Law on Teachers and Lecturers, competence is a set of knowledge, skills, and behaviors that must be possessed, internalized, and mastered by teachers or lecturers in carrying out their professional duties (Law of the Republic of Indonesia No. 14 of 2015, Article 1 Paragraph (10)). A teacher must not only master the teaching material, but must also master how to teach the material so that it can be conveyed to students well. These two things, namely teaching material (content) and how to teach it

(pedagogy), are interconnected and inseparable (Agustina. 2015). Thus, a teacher needs competence to achieve educational goals so that every teacher must master competence. In keeping up with the increasingly rapid development of the era, teachers must always upgrade various learning knowledge to be in accordance with the development of society, student characteristics, and the development of science and technology. According to Mulyasa (2014), technological developments can change the role of teachers from teachers who only deliver teaching materials to teachers who act as facilitators who can guide students to provide ease in learning. A teacher who uses technology in learning can facilitate the delivery of abstract material to be easily understood by students (Maeng, 2013). From this statement, a new development idea emerged from teaching materials and pedagogy (PCK) combined with technology to become TPACK, namely technology, pedagogy, and material content. TPACK is a learning framework that integrates technological knowledge, content knowledge, and pedagogical knowledge in a particular learning context (Oktaviana, 2021). TPACK competencies need to be mastered by professional teachers because TPACK is in the four competency domains that teachers must have (Suyamto et al., 2020).

In the research of Doering, et al. (2009) revealed that the integration of TPACK can improve content, pedagogical, and technological competencies and increase teacher confidence when implementing the teaching and learning process. Therefore, the motive for developing teacher competency with TPACK can be the right shortcut to protect the achievement of relevant learning along with the development of the times.

However, the facts on the ground found that teachers and schools in Indonesia still have problems including teacher standards, mastery of materials, and low media and technology/media and technology literacy (Suyamto et al., 2020). This shows that teachers' TPACK competencies have not been implemented properly. Therefore, TPACK is likened to a potential framework that can create new techniques for teachers in Indonesia when solving problems related to the integration of computers and technology in teaching and learning processes (Bahriah & Yunita, 2019). In TPACK, the integration of technology into learning is influenced by teacher knowledge so that learning can run efficiently and effectively.

Physical Education, Sports and Health (PJOK) is one part of the subjects to improve human resources, especially in the physical field, fostering a healthy life physically and mentally which in everyday life leads to complete health which is given in elementary schools, junior high schools, and high schools. Physical education is a process of educating someone as an individual or member of society which is carried out consciously and systematically through various physical activities to obtain physical growth, physical health and physical fitness, abilities and skills, intelligence and development of character and personality in order to form quality Indonesian individuals, in essence physical education is an educational process that utilizes physical activities to produce holistic changes in individual quality, both in terms of physical, mental, and emotional (Abdullah and Wicaksono, et al, 2020: 42).

PJOK taught in schools has a very important role, including providing opportunities for students to be directly involved in various learning experiences through selected physical activities that are carried out systematically. Providing learning experiences that are directed at fostering better physical growth and psychological development and at the same time forming a healthy and fit lifestyle throughout life. Thus, the goal of physical education in schools is identical to the goal of education.

Based on the observations that researchers have conducted, reviewing the condition of the school environment, conducting a survey of problems with the implementation of TPACK in sports subjects. Data obtained in the Physical Education learning process only prioritizes teachers and textbooks as message deliverers so that the material studied by students is more conventional because teachers do not maximize the use of more interactive media as a teaching aid. As a result, students are less focused and active in receiving the lesson material delivered. TPACK competency in teachers, especially in physical education learning in this century, needs to be measured in order to determine the extent of teacher knowledge of the use of technology that is relevant to the material to be delivered through learning strategies and methods that are in accordance with the needs of students.

Based on the phenomenon of low TPACK-based learning which is very important in the 21st century learning paradigm, the researcher is interested in conducting research on the Implementation of Technology Pedagogy and Content Knowledge (TPACK) Based Learning in Physical Education Subjects for Senior High School Sports Teachers in Jambi City.

## **METHODS**

This study uses a descriptive quantitative approach with a descriptive survey method. The selection of this design aims to obtain an objective picture of the implementation of Technology Pedagogy And Content Knowledge (TPACK)-based learning by physical education teachers in State Senior High Schools throughout Jambi City. The survey method was chosen because it allows researchers to measure teacher perceptions and attitudes systematically through questionnaire instruments. This research was conducted from August to September 2024, with research locations spread across all State Senior High Schools in Jambi City.

The population in this study was all 47 state high school sports teachers in Jambi City. Because the population is not too large, the total sampling technique was used, so that the entire population was used as a research sample. Data collection was carried out by distributing closed questionnaires that adopted the instrument from Amrullah (2022), containing 49 statement items based on seven main indicators in the TPACK framework. This instrument has undergone previous validity and reliability tests, and uses a Likert scale of 1-5 to assess the level of respondent agreement with the statements given (Sugiyono, 2015).

Data analysis in this study used descriptive statistical techniques processed through the SPSS version 25.0 program. The data obtained will be presented in the form of tables, averages (means), modes, medians, and standard deviations. Assessment of the level of TPACK implementation was carried out using the Benchmark Assessment (PAP) type II, where the percentage results of the research scores were compared with the ideal scores to determine assessment categories such as "very good," "good," "enough," and so on. The calculation results will be the basis for concluding the extent to which sports teachers in State High Schools throughout Jambi City have implemented TPACK-based learning (Notoatmojo, 2017).

The presentation of data in this study uses tables, calculations of mode, median, mean, and standard deviation. Regarding the creation of assessment categories, the Type II Benchmark Assessment (PAP) is used. Type II PAP is an assessment that compares research results with a predetermined criterion/benchmark. The PAP table of predetermined criteria/benchmarks.

$$P = \frac{\sum x}{X_{id}} \times 100\% \text{ (Sugiyono, 2019)}$$

**Description**

P = Percentage of the average score sought

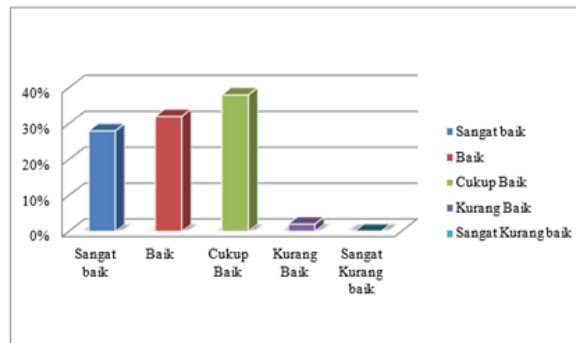
$\sum X$  = Total score of research results

X<sub>id</sub> = Ideal score for each variable

**RESULT**

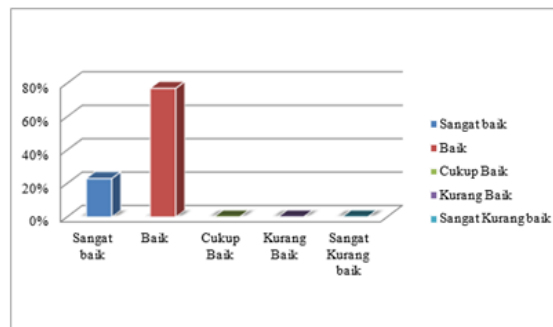
Based on the description that has been collected previously, this chapter will analyze the discussion obtained in this study. The results of the study will be described in accordance with the objectives and hypotheses proposed previously. The questionnaire distributed was aimed at Senior High School Sports Teachers throughout Jambi City. Furthermore, the study was conducted on a sample of 47 people as respondents who were able to fill out the questionnaire properly. Given that the respondent's task is only to provide a checklist on the selected answer. The data is processed in the form of a table and then analyzed.

The following is an analysis of each indicator item of the statement answered by respondents.



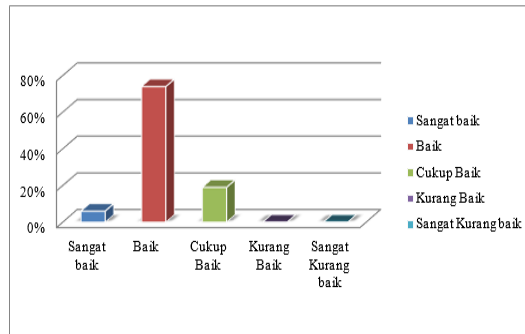
**Figure 1.** Learning Implementation Diagram on Technological Knowledge Indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Technological Knowledge indicator is included in the good category, namely 74%.



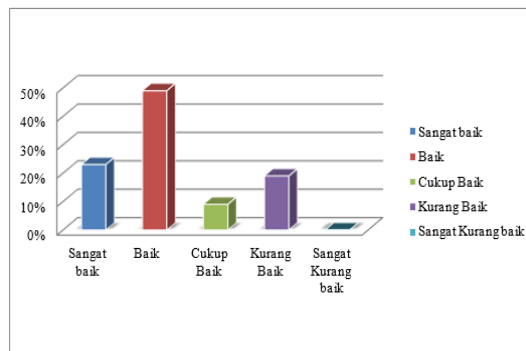
**Figure 2.** Learning Implementation Diagram for Pedagogical Knowledge Indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Pedagogical Knowledge indicator is included in the good category, namely 83%.



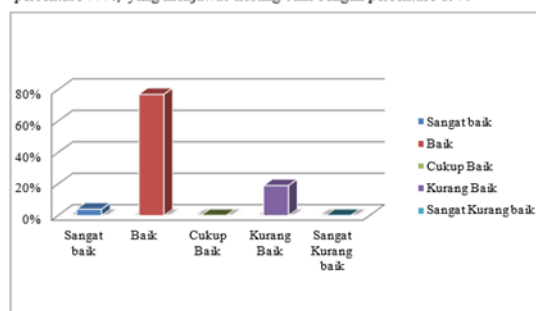
**Figure 3.** Learning Implementation Diagram for Content Knowledge Indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Content Knowledge indicator is included in the good category, namely 77%.



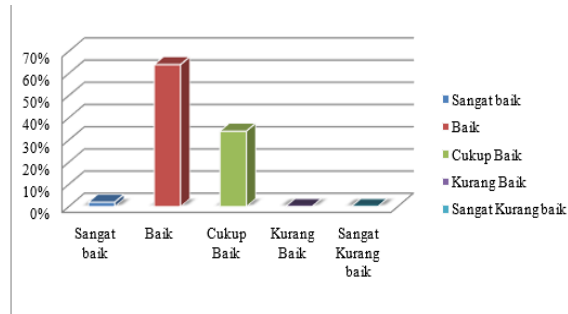
**Figure 4.** Learning Implementation Diagram for Technological Content Knowledge Indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Technological Content Knowledge indicator is included in the good category, namely 71%.



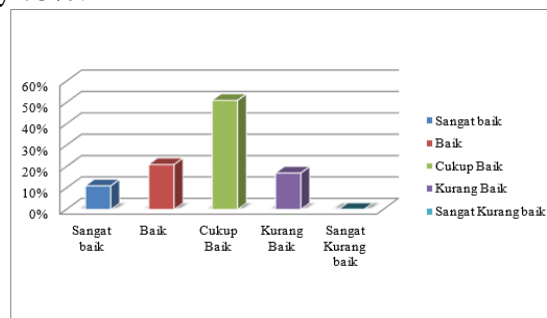
**Figure 5.** Learning Implementation Diagram for the Pedagogical Content Knowledge indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Pedagogical Content Knowledge indicator is included in the good category, namely 74%.



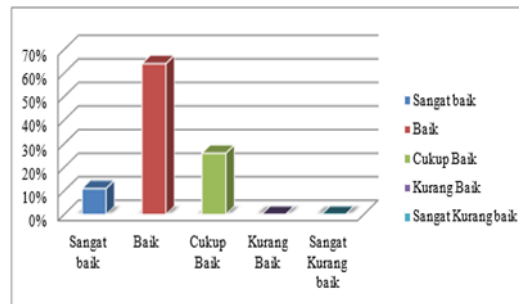
**Figure 6.** Learning Implementation Diagram on Technological Pedagogical Knowledge Indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Technological Pedagogical Knowledge indicator is included in the good category, namely 73%.



**Figure 7.** Learning Implementation Diagram on Technological Pedagogical Content Knowledge Indicator

From the calculation results above, it can be seen that the Implementation of Learning on the Technological Pedagogical Content Knowledge indicator is included in the fairly good category, namely 64%.



**Figure 8.** Implementation Diagram of Technology Pedagogy and Content Knowledge (TPACK) Based Learning in Physical Education Subjects for Senior High School Sports Teachers in Jambi City

From the calculation results above, it can be seen that the Implementation of Technology Pedagogy and Content Knowledge (TPACK) Based Learning in Physical Education Subjects for Senior High School Sports Teachers in Jambi City is included in the good category, namely 75%.

## DISCUSSION

Learning is an effort to make students learn, so that the situation is a learning event (event of learning) which is an effort to change the behavior of students. Changes in behavior can occur because of the interaction between students and their environment. Meanwhile, according to Chauhan, learning is an effort to provide

stimulus, guidance, direction and encouragement to students so that the learning process occurs. Good learning process planning will certainly have an impact on a good learning process. Therefore, in preparing the planning, guidelines are needed so that the learning process planning functions as it should.

The learning process in the 21st century certainly requires effective learning methods or media in accordance with the progress of the era that utilizes developing technology. The technology used is certainly the right technology to help apply pedagogical knowledge in teaching the main points of certain subject matter. The application of the TPACK framework in the learning process allows teachers to develop their knowledge so that they can create a better learning environment by utilizing the existence of technology (Koehler, Mishra, & Cain, 2013).

The professionalism inherent in teachers requires mastery both theoretically and practically in organizing between technology, pedagogy and learning content. Based on the explanation that has been outlined according to several experts above, it can be concluded that TPACK is knowledge about how existing technology can be used to support the learning process.

In the Implementation of Technology Pedagogy and Content Knowledge (TPACK) Based Learning in Physical Education Subjects for Senior High School Sports Teachers in Jambi City, out of 47 teachers, 5 teachers answered very well with a percentage of 11%, here teachers who really know technology, they always follow the development of education and educational technology, 30 teachers answered well with a percentage of 64%, here the majority of teachers are still relatively young, and always follow the development of educational technology so far, so they are always ready to face the development of education through current technology, 12 teachers answered quite well with a percentage of 26%, on average here teachers who are over 45 years old, their understanding of technological developments is still lacking compared to young teachers.

From the research results, it was obtained that the implementation of technology pedagogy and content knowledge (TPACK) based learning in Physical Education Subjects for Senior High School Sports Teachers in Jambi City was included in the good category, namely 75%.

## **CONCLUSSION**

The conclusion in this study is that the Implementation of Technology Pedagogy and Content Knowledge (TPACK) Based Learning in Physical Education Subjects for Senior High School Sports Teachers in Jambi City is included in the good category, namely 75%, 5 teachers answered very well with a percentage of 11%, 30 teachers answered well with a percentage of 64%, and 12 teachers answered quite well with a percentage of 26%.

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