

Analysis of TPACK Learning Media Ability of Biology Teachers in Tanjungpinang City Coastal Area

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Abstract. The ability of TPACK in learning media is the ability of teachers to integrate pedagogy, content, and technology into the learning media used. But in fact, there are still biology teachers who are unskilled in using technology in learning media. Some teachers only use PowerPoint as a learning media in the classroom. So therefore, it is necessary to analyze the ability of TPACK learning media of biology teachers in coastal. Thus can be used as information to improve the quality of learning media developed by teachers in each school of Tanjungpinang city coastal area, in order to goals of SDGs in its education of the city. This research aim to describe the profile of the ability of TPACK learning media Biology teacher in Tanjungpinang city coastal area. The data collection technique was carried out using the learning media TPACK Biology and Science questionnaire. The questionnaire was given to 14 Tanjungpinang High School Biology teachers who are in the area coast. Research results show that TPACK Learning Media ability High School Biology Teachers in the Coastal Area of Tanjungpinang City of 76.79% with good criteria.

1 Introduction

The educational world today faces the challenge of improving quality education in order to achieve the Sustainable Development Goals (SDGs). One of the crucial fields that contributes to the growth of the country is thought to be education. Education is required to produce human resources (HR) that are qualified and able to master the science of technology and art [1]. In line with goal number 4 of the SDGs program, which is to provide quality, fair, equal education and opportunities for lifelong learning for all ages [2]. In order to achieve the goals and strategies of these SDGs, it is necessary to pay attention to some things in the implementation of education to ensure quality education.

Quality education can be achieved, one of which is by improving the competence of teachers in mastering the use of information technology so that they can produce qualified HR [3]. The maintenance of innovative and quality education can motivate student to sharpen their desire to act as agents of change that will take place, which plays an important role in the SDGs. The use of information technology can be used by teachers in the development of learning media so that they can process and support learning [4].

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In the selection and development of learning media, teachers must be able to master the load of TPACK (technological, pedagogical, and content knowledge). The learning students will be good when teachers can master the capabilities of technology pedagogical and content knowledge (TPACK) on their learning media [5]. Therefore, the quality of HR in the face of the development of science and technology can be improved.

The selection and development of learning media using the TPACK abilities is expected to increase the activity of students in learning so that learning becomes more meaningful. This is because TPACK is a framework that combines three aspects of learning: technology, pedagogy, and content, in relation to their application according to their context [6]. But in fact, there are still biological teachers who are unskilled in using technology in the learning media used in learning. Some teachers only use PowerPoint as a learning media in the classroom. This will lead to the student's saturation in pursuing learning. So the competence of TPACK teachers in learning media needs to be measured to determine the quality of learning media related to pedagogy, content, and technology. In particular, the capabilities of TPACK media teachers in the coastal area of Tanjungpinang The capability of the TPACK Media Teachers in coastal areas need to be analyzed in order to know the profile of the ability of teachers TPACK, so that it can improve the quality of the learning media developed by teachers at each school in a coastal region, in particular the City of Tanjungpinang, to meet the goals of the SDGs in the field of education in the City of Tanjungpinang.

2 Method

This research is a quantitative descriptive study. The data collection was carried out using TPACK Learning Media Biology and Science questionnaires with 14 respondents from Tanjungpinang High School Biology teachers who were in the coastal area. The data analysis used in this study is a descriptive analysis with a description of the data that has been obtained without generalizing the results of the research. TPACK capability data analysis is done using the Likert scale as follows:

$$NP = \frac{R}{SM} \times 100\%$$

Description:

NP : Percentage value searched

R : Score obtained

SM : Maximum score

The score of the TPACK profile interpretation Criteria on Table 1.

Table 1. Score Interpretation Criteria

TPACK Profile Score (%)	Criteria
81-100	Very good
61-80	Good
41-60	Good Enough
21-40	Not Good
0-20	Very Not Good

3 Results and Discussion

The Analyzed of TPACK learning media ability of high school biology teachers in Tanjungpinang coastal region was carried out on 14 sample of Biology high school teachers. The analysis was carried out on 7 aspects of TPACK. The TPACK aspects were presented in 29 statements. The results of the TPACK learning media ability of high school biology teachers can be seen in Table 2.

Table 2. Result of Analysis TPACK Learning Media Ability of High School Biology Teachers in Tanjungpinang City Coastal Area

No	Aspect	Average	Percentage	Criteria
1	Technological Knowledge (TK)	3.02	75.45	Good
2	Pedagogical Knowledge (PK)	3,16	79.02	Good
3	Content Knowledge (CK)	3.00	75.00	Good
4	Pedagogical Content Knowledge (PCK)	3,18	79,46	Good
5	Technological Content Knowledge (TCK)	3.00	75.00	Good
6	Technological Pedagogical Knowledge (TPK)	3,14	78.57	Good
7	Technological Pedagogical Content Knowledge (TPACK)	3.07	76,79	Good

Based on Table 2, we can see that the learning media capacity of TPACK teachers of high school biology in the coastal area of Tanjungpinang City has a criterion of good with a ratio of 76.79%. The aspect of knowledge of pedagogical content (PCK) has the highest proportion of 79.46% in the category of good. This means that high school biology teachers in Tanjungpinang Coast Region have been good at integrating technological, pedagogical, and content aspects into the learning they undertake. This is in line with the research carried out by Hidayat (2018), where the ability of TPACK biology teacher class X State High School in Surakarta has both categories caused by the means and resources of adequate learning media that the state school owns [7]. Nevrita et al in 2020 has also analyzed the ability of TPACK on two aspects, TK and PCK, on the learning media of Tanjungpinang city biologist teachers. In the study, the results showed that the teacher's ability on the two aspects of the TPACK is already very good, but the use of technology in learning media is still simple [5].

Teachers of coastal biology in Tanjungpinang have been able to use technology in learning media to achieve learning goals. That teachers need good TPACK skills for effective learning in class. With effective learning, it is expected to provide a significant pathway to the quality of education. This indirectly supports the achievement of the SDGs' goal of quality education [1]. To improving education would drive the standard of the goals of the SDGs, one of which is to improve the quality of the index of human development in Indonesia [2].

Despite this, the teacher stated that the ability to use all biological equipment in an IT-based laboratory as a standard support of learning objectives is still on fairly good criteria. This can affect the learning process of the learners when using laboratory tools. Educational system should be able to create a pleasant learning environment and process to encourage

students to develop their skills to the maximum in order to ensure the maximum evaluation of the quality of education in the SDGs [8].

Based on the results of the analysis, it is still necessary to train high school biology teachers in coastal areas related to TPACK in order to improve teachers' abilities in the use of IT-based laboratory equipment as well as in the face of technological developments in the field of education. It's in line with the SDGs' strategy of improving the quality of education, one of which is improving qualified teachers.

4 Conclusion

Based on the results of the research, it can be concluded that the ability of TPACK media learning biology teacher high school in the coastal region of Tanjungpinang City has met good criteria with a ratio of 76.79%. Where all aspects of the TPACK are TK, PK, CK, TCK, PCK, TPK, and TPACK meet the criteria, Teachers of coastal biology in Tanjungpinang have been able to use technology in learning media to achieve learning goals. Despite this, the teacher stated that the ability to use all biological equipment in an IT-based laboratory as a standard support of learning objectives is still on fairly good criteria.

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