

Application of TPACK Learning For Elementary School Teachers to Improve Numeracy Literacy Skills in Sosial Subject at Lesanpuro 1 Elementary School

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Abstract

Numeracy literacy skills in Indonesia are currently still very low which has an impact on the quality of education. Overcoming this requires learning innovation, one of which is through TPACK learning. Based on the results of the needs analysis conducted at SDN Lesanpuro 1 Malang City, TPACK learning training is still needed to support teacher professionalism. The purpose of this study is to analyze how TPACK learning training at SDN Lesanpuro 1 Malang City can affect teacher competence. The research method used is training and mentoring teacher competencies through several stages, namely, planning, implementation, and evaluation. Data in the form of documentation and test results will be analyzed descriptively qualitative to describe the achievement of the program. The results of this study indicate an increase in the ability of teachers to present TPACK learning as indicated by the average score of learning implementation of 86.1. Meanwhile, in the aspect of learning evaluation, the test results were obtained with an average of 82.3 which was included in the good category.

Keywords: numeracy literacy, teacher, TPACK learning, training

Introduction

Literacy is no stranger to education. Literacy is no stranger to education. This ability is the basis before individuals explore broader knowledge and understanding. Literacy is more than just competence in reading and writing. In language, literacy comes from the word *litteratus* which is defined as a person who learns (D et al., 2022). Literacy itself means a person's ability to speak, including the ability to listen, read, write, and think about information (Bu'ulolo Yanida, 2021). Based on the Big Indonesian Dictionary, literacy means more than that. Literacy is a person's ability to capture and understand knowledge to be applied in everyday life (Fahrianur et al., 2023). There are six basic literacies including literacy, numeracy, science literacy, digital literacy, financial literacy, and cultural and civic literacy (Ate & Lede, 2022).

Numeracy literacy is the skill in processing numbers and symbols that are closely related to mathematics (D et al., 2022; Han et al., 2017). This ability has a very important role to solve problems in everyday life. For example, in commerce, planning, or the simplest is time management. However, based on the Program for International Students Assessment (PISA) assessment, Indonesia's numeracy literacy is still low (Feriyanto, 2022). Quoted from the CNBC Indonesia page, Indonesia's numeracy literacy score is one of the lowest in the world, especially after Covid-19. Indonesia's low numeracy literacy affects the quality of Indonesian education.

In order to improve the quality of Indonesian education, various learning innovations are needed that support basic to applied skills in children from elementary school age. The current development of science and technology can be utilized as a synergy for learning sustainability to create learning that suits the needs of society. Technology integration in learning can be realized through TPACK (Technological, Pedagogical, and Content Knowledge) based learning. The combination of technology, learning materials, and qualified teacher competence can provide effective learning for students (Witarsa & Siregar, 2023). As explained, TPACK learning combines three aspects, namely technology, pedagogics, and material (science) in learning (Amelia et al., 2023). The implementation of this learning also supports professionalism and the ability to digitize education in presenting interactive learning (Oktaviana & Yudha, 2022).

With the TPACK learning concept, good teacher competence is needed. However, teacher competence in presenting TPACK-based learning is still quite low, especially teachers who are elderly or teach in areas with inadequate access to technology (Amelia et al., 2023). In Rustini (2023) it is also mentioned that the obstacles to TPACK learning in schools also lie in the provision of infrastructure, as well as training programs that have not been effective in supporting this learning. In line with this, based on the results of interviews conducted at SDN Lesanpuro 1 Malang City, TPACK learning training, especially in IPAS learning, is an urgent need that must be implemented. This was conveyed by the principal and student teachers, that TPACK learning is needed so that both students and teachers are not technologically illiterate.

TPACK-based learning training can be realized in various activities, such as developing technology-based media (Rahmatullah & Kadarwati, 2023), preparing learning tools (Wulandari, 2021), and developing learning evaluations (Gumala et al., 2023). This training is aimed at improving teachers' competencies, especially in integrating technology in learning. It can be said that through training and mentoring, teacher competence increases so that they can become professional teachers (Sirajuddin et al., 2023).

Based on the description above, this study aims to analyze how TPACK learning training at SDN Lesanpuro 1 Malang City can affect teacher competence. TPACK learning will be presented in social studies subjects to improve students' numeracy literacy skills. It is hoped that the results of the study can be an innovation in supporting the quality of education through improving teacher competence, as well as a solution to the low level of numeracy literacy skills in Indonesia.

Research Methods

The implementation of community service in the form of training and mentoring for teacher competence was carried out on July 15, 2024 at SD Negeri Lesanpuro 1 Malang City. The activity was carried out through several stages, namely planning, implementation, and evaluation. In the planning stage, a needs analysis was conducted regarding TPACK learning implemented by schools. This was followed by a material briefing stage to provide insight into TPACK learning, as well as assistance in preparing TPACK learning tools from teachers. At the end of the training, an evaluation was conducted to measure the extent to which the training affected the teachers' ability to understand the TPACK learning components. The research subjects were 7 teachers at SDN Lesanpuro 1 Malang City. The data collected in the form of documentation and test results will be analyzed descriptively qualitative.

Results and Discussions

The research was conducted at SDN Lesanpuro 1 Malang City on July 16, 2024, in the form of a training and mentoring program for the preparation of TPACK-based learning tools. A total of 6 class teachers and 1 subject teacher participated in the program very well. The

training consisted of several stages as mentioned above, namely planning, implementation, and evaluation. The planning stage was conducted prior to the training through analyzing the school's needs for TPACK learning. It was found that schools are in dire need of teacher training in presenting TPACK learning, especially in social studies subjects. Furthermore, at the implementation stage, teachers were briefed on TPACK learning and how to develop a good plan. The results of the training are presented as follows.

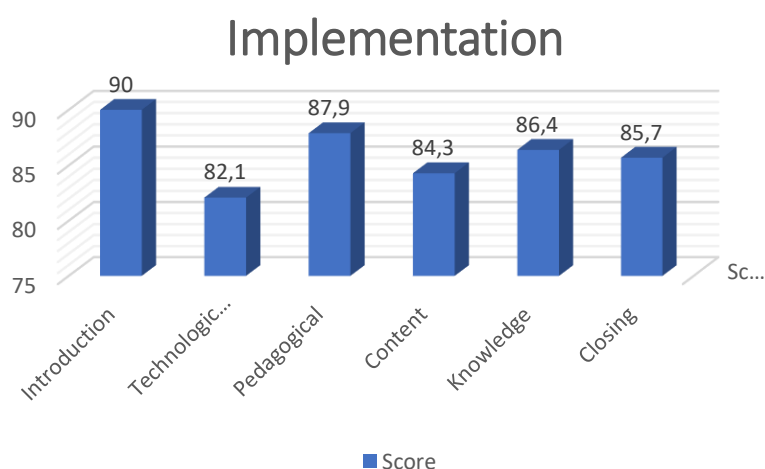


Figure 1. TPACK learning training implementation results

Based on the Figure 1, it is known that the average teacher ability is 86.1 with a very good category. It can be said that the training program can improve teachers' skills in presenting TPACK learning to improve numeracy literacy skills in social studies subjects. In addition, in order to find out how the effect of TPACK learning on students' numeracy literacy skills, teachers are expected to compile instruments. The learning evaluation stage is measured through making grids, making rational decisions, actively participating in society, solving complex problems, and analyzing student answers.

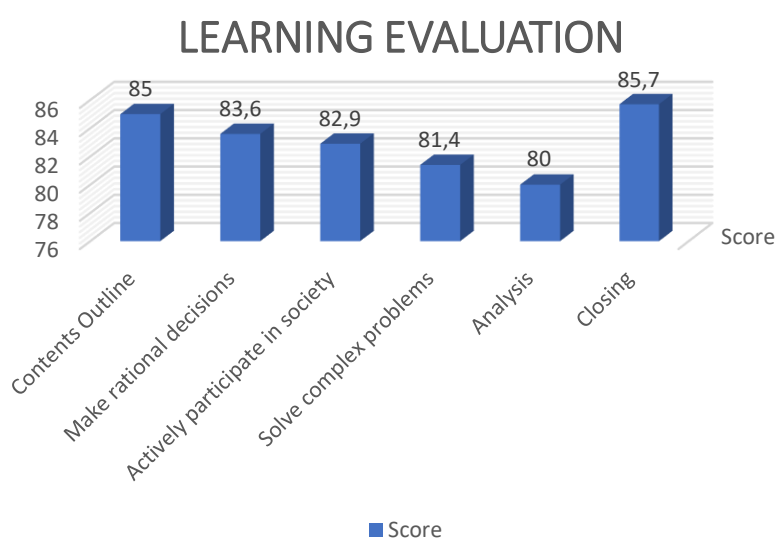


Figure 2: Results of the evaluation stage

Figure 2 shows the average obtained at the evaluation stage in the good category with a score of 82.3. This shows that the TPACK lesson planning assistance for teachers at SDN

Lesanpuro 1 can be said to be effective. The training program is able to improve teachers' knowledge and skills in developing TPACK-based learning tools (Wulandari, 2021).

The teacher's response to the training program is said to be in the positive category. This is shown by the enthusiasm of the teachers to participate in the TPACK learning briefing shown on Figure 3. Some teachers also responded to the material presented for the sustainability of TPACK learning at school shown on Figure 4. Here are some documentation of the training activities.

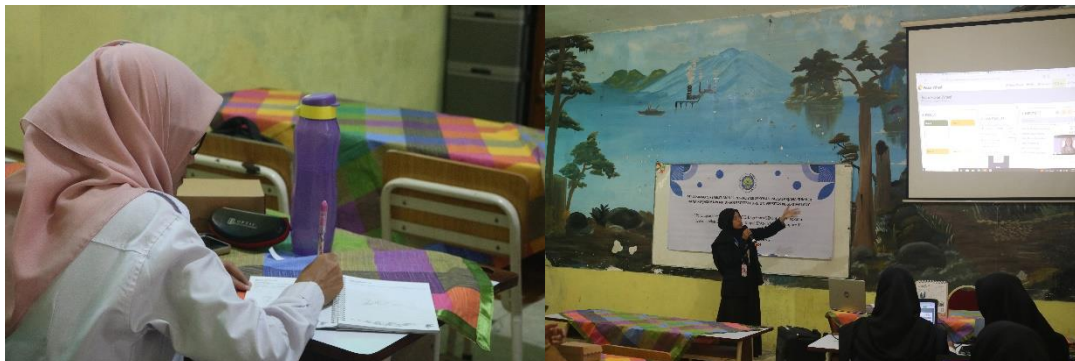


Figure 3. Training on the preparation of TPACK-based learning tools



Figure 4. Teachers' positive response to the training activities

TPACK learning prioritizes the integration of technology in learning accompanied by effective and innovative teaching competencies of teachers. The presence of technology-based interactive learning tools supports the creation of learning independence for students because students can interact with the media as well as technology literacy. The position of media as a learning support helps students build their own knowledge. In addition, TPACK learning is considered capable of increasing students' learning motivation by adjusting their learning needs.

Indicators of learning implementation include introduction, technological, pedagogical, content, knowledge, and closing to improve literacy and numeracy skills (making rational decisions, actively participating in society, and solving complex problems) in social studies subjects. As listed in Figure 1, the six indicators determine whether teachers are able to implement TPACK-based learning well. Four TPACK components plus 2 additional indicators, namely introduction and closing, are competencies that teachers must have in TPACK learning. Meanwhile, in (Oktaviana & Yudha, 2022) stated that there are 7 TPACK frameworks including Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK). In this training, the speaker introduced several websites that can be used as sites for making TPACK-based learning tools including the following.

1. Technology-based learning website

2. Website to create groups automatically
3. Teaching module integrated with technology
4. Learning evaluation maker application

In this case, social studies learning is integrated with TPACK with the aim of providing a more interesting learning experience to students, because social studies subjects are considered as boring learning (Somantri & Komala Putri, 2024). The implementation of TPACK learning in social studies learning is able to improve numeracy literacy skills consisting of making rational decisions, actively participating in society, and solving complex problems. It has previously been explained that the role of numeracy literacy in everyday life is very important. Therefore, this ability needs to be improved to support the competence of the next generation.

Conclusion

Based on research conducted at SDN Lesanpuro 1 Malang City, it is known that the TPACK learning training and mentoring program can improve teacher competence. This is indicated by the average score of learning implementation at 86.1. Meanwhile, in the aspect of learning evaluation, the test results were obtained with an average of 82.3 which was included in the good category. Teacher response to the program was also in the positive category where several teachers actively responded to the material presented. This training is expected to have a positive impact on teacher professionalism, and can be integrated with other subjects in a sustainable manner.

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