**Conference Paper**

# Teacher's Perception of the Integration of Science Technology Society (STS) into Learning at Elementary School

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**Abstract.**
The Science Technology Society (STS) is an integrated and holistic approach between science, technology, and societal issues. This study aims to determine teachers' perceptions of integrating science, technology, and society into learning at elementary schools. This study uses a qualitative approach. The respondents of this study were twelve elementary school teachers in the city of Surabaya. The results of this study indicate that teachers respond positively to the Science Technology Society (STS) because it provides an understanding of the relationship between science and technology and society and trains judgment sensitivity.

**Keywords:** Teacher's Perception, Science Technology Society (STS), Elementary School

## 1. Introduction

The 21st Century Learning is learning that integrates literacy skills, knowledge skills, skills and attitudes, and mastery of technology (1), (2). The approach to learning activities is one of the essential parts of a learning process; students who can carry out learning activities optimally will undoubtedly get more learning experiences than other students. Learning will lay the foundations and competencies, measuring competence in the order of Lower Order Thinking Skills ( LOTS) to Higher Order Thinking Skills (HOTS) (3)–(5)

Learning activities are described as active processes by students in organizing, constructing, and reconstructing concepts based on learning experiences. Thus, it is clear that mastery of ideas cannot be obtained if learning activities are only limited

to transferring subject matter from teachers to students. The learning process must prioritize student activity and emphasize the minds-on and hands-on abilities that exist in students. The 2012 Program for International Student Assessment (PISA) research results show that Indonesia is in 64th place with an average science acquisition of 382 out of 65 countries studied (6). This means that Indonesia is still lagging. Far from other countries in terms of the development of knowledge obtained through the educational process

But in reality, science and technology are developing dynamically. For this reason, the learning approach must continue to innovate to encourage students to follow and make appropriate use of the development of science and technology. Ensure relevance to the needs of life, including social life, the business world, and the world of work. Therefore, the development of personal, thinking, social, academic, and vocational skills must be implemented.

Thus, learning in elementary schools should be linked to children's daily experiences. As part of the community, children can be accustomed to finding problems in the local and global environment and formulating scientific solutions that relate to science and technology concepts. For this reason, the Science Technology Society (STS) approach can be applied to learning in elementary schools. Studies on Science-Technology-Society have often been done by Primastuti & Atun (7), suggesting that the implications of the STS approach can be used as a learning approach to improve students' cognitive learning outcomes. In the learning process with the STS approach, issues or problems are raised first and explored from the constructivist approach (8). Thus, students will be trained to care about the environment, be aware of the positive and negative impacts of technology, and be mindful of the values held in society. Still, qualitative research is to discover in-depth how teachers perceive the integration of Science-Technology-Society in elementary school learning(9), (10).

The Science Technology Society (STS) approach carries Constructivism Theory, where students build their own understanding of learning materials in this approach. In addition, the Science Technology Society (STS) approach also accommodates a contextual teaching and learning approach, in which students are directly invited to understand science according to natural conditions that occur in their surrounding environment (11). In the Science Technology Society (STS) approach, the environment is not only the form of a physical environment where students can study natural phenomena, abiotic (non-living things), and natural phenomena biotic (living things). STS also explores their impact on society (the environment). (Public) (12), (13).

The Science-Technology-Society approach is expected to be one of the references in the teaching and learning process, especially at the elementary school level, and increase the effectiveness and efficiency of learning. Therefore, applying the Science-Technology-Society learning model will make it easier for teachers to achieve the expected goals. The focus of teaching Science-Technology-Society is on how to make students able to conduct investigations to gain knowledge of science, environment, technology, and society that are interrelated. Asking students to carry out investigations means allowing them to develop further the knowledge gained to solve problems that are thought to arise around the life they are studying. This research is expected to contribute to the repertoire of knowledge, especially learning in elementary schools and teachers' perceptions of the integration of Science-Technology-Society.

# 2. Method

This study aims to determine teachers' perceptions of integrating science, technology, and society in learning in elementary schools. The research design used is a qualitative approach. The qualitative approach is more relevant and suitable because it aims to explore and understand the reality of the teacher's perception. Qualitative descriptive research aims to describe existing phenomena, both natural and human-engineered, which pays more attention to the characteristics, quality, and interrelationships between activities. In addition, descriptive research does not provide treatment, manipulation, or changes to the variables studied but described a condition as it is. The only remedy was the research, which was carried out through observation, interviews, and documentation (14).

## 2.1. Respondent

The selection of respondents in this study used a purposive sampling technique. The purposive sampling technique involves sampling data sources with specific considerations. The consideration is elementary school teachers in Surabaya with a working period of more than two years. The number of respondents in this study was ten teachers

## 2.2. Data Collection Procedure

The data collection procedure is the most strategic step in research because the study's primary purpose is to obtain data. The researcher will not get data that meets the set

standards without knowing the data collection procedure. To produce the data needed in this study, an appropriate process is necessary, and in this study, the researchers used interview and documentation data collection techniques.

## 2.3. Data analysis

Qualitative data analysis is carried out if the empirical data obtained is qualitative in a collection of actual words, not a series of numbers, and cannot be arranged in categories/classification structures. Data can be collected in various ways (observation, interviews, document digests, tapes) and are usually processed before they are ready for use (through recording, typing, editing, or transcribing). However, the qualitative analysis still uses words usually organized into expanded text. Analysis activities consist of three activity flows that coincide: data reduction, data presentation, and conclusion drawing/verification. Occurring simultaneously means that data reduction, data presentation, and conclusion drawing/verification as intertwined are cyclical processes and interactions before, during, and after data collection in parallel forms that build general insights called "analysis".

# 3. Result and Discussion

## 3.1. Results

### 3.1.1. The results of data analysis are illustrated in Figure 1. Namely, there are two focus discussions on Teacher Perceptions of the integration of science, technology and society in learning in elementary schools. as follows

### 3.1.2. Strengths and weaknesses Integration of science, technology, and society in learning in elementary schools

Because it can train students' critical thinking skills, the Science Technology Society (STS) approach presents social problems, is used as a topic in learning, and provides learning experiences in identifying an issue related to science, technology, and society. Teachers' perceptions of the advantages of integrating science, technology, and culture in elementary schools generally suggest that learning with this approach is more active learning and student center. Students are expected to be able to find solutions to the
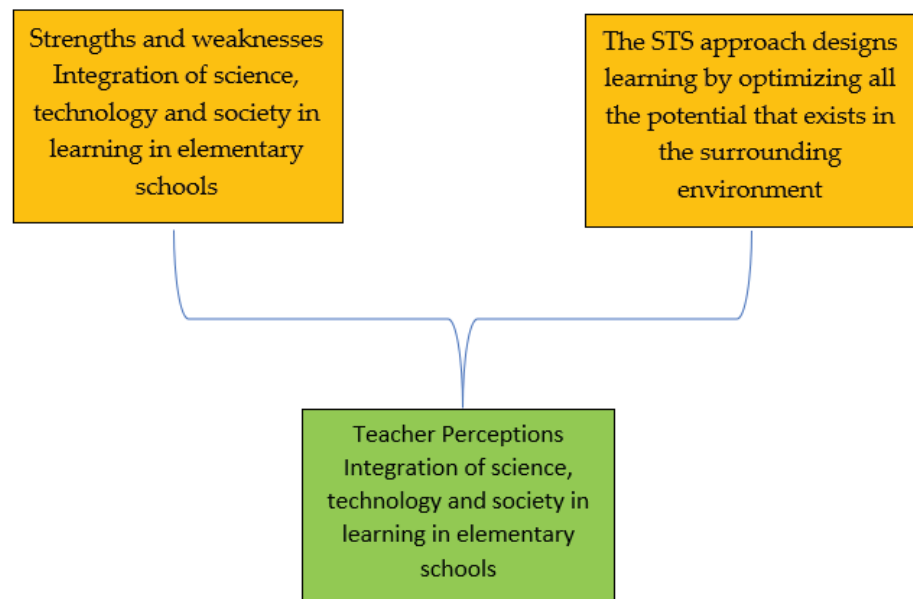
**Figure** 1: The focus of the discussion on Teacher Perceptions The integration of science, technology, and society in learning in elementary schools.

issues presented so that they can bring up a curious attitude related to scientific perspectives. Furthermore, according to the respondents, the weakness was that students, especially students in low grades, had not been able to operate the existing science and technology. And the support facilities in some schools are lacking or almost non-existent, which is an obstacle for the Science Technology Society (STS). Cost is essential in implementing the Science Technology Society (STS). Costs are needed to support the implementation of learning with the Science Technology Society (STS) approach, starting from problem identification to implementing a showcase. Generally, the school has not allocated funds for the Science Technology Society (STS) learning activities. Therefore, the school, in particular, should provide moral and material encouragement for implementing this Science Technology Society (STS) application.

### 3.1.3. The STS approach designs learning by optimizing all the potential that exists in the surrounding environment

The role of science and technology in utilizing the environment provides various things that students can learn. The teacher's perception of the integration of science technology and society in learning in elementary schools is because the Science Technology Society (STS) can design learning by optimizing all the potential that exists in the surrounding environment. Learning resources utilizing science and technology as well as the environment further enrich insight and knowledge because classroom walls

and children do not limit children can optimize the potential of the five senses to communicate with the environment *(Respondent 1)*. The use of the environment allows for a more meaningful learning process because students are faced directly with the actual situation and situation. this will fulfill the aspect of a concretization in learning as one of the principles of education in elementary schools *(Respondent 2)*. Using the environment as a learning resource will encourage the appreciation of local values or aspects of life. Awareness of the importance of the environment in life can be instilled in elementary school children *(Respondent 3)*. This STS is important to be applied in elementary schools because teachers and students can take advantage of the school environment and gardens. It is expected that students get a concrete, contextual, and varied learning experience so that learning is more interesting, active, and fun (Respondent 4 ). the concept of learning using the environment will provide opportunities for students to improve learning outcomes. The idea of learning by using the environment also includes learning motivation for students *(Respondent 5)*.

The use of the Science Technology Society (STS) in learning in elementary schools is observed by researchers that teachers must try to facilitate students to experience learning together with various kinds of human characters so that students are more prepared when they enter society. One example that can be done is to form student study groups. Students are grouped into small groups based on their respective classes. Assignments are assigned according to grade level. It is hoped that in groups, students can actualize themselves and through learning activities in groups, students are expected to gain many things, including more knowledge and skills because they can learn from their friends.

## 3.2. Discussion

Based on the results of this study, it was found that two Science Technology Society (STS) is an integrated approach between science, technology and issues that exist in society. The Science Technology Society (STS) approach aims to produce students who are sufficiently equipped with knowledge to make important decisions about societal problems and take action in connection with their findings (7). Science as a process includes ways to acquire, develop and apply knowledge, which provides how to work, think, solve problems, and behave. Science is formulated systematically, mainly based on experimental observations, and science underlies technological developments. Technology is advanced science and intelligence in making discoveries related to natural science discoveries or related to industrial products. In science, technology

is essential because it is very supportive, especially for activities to obtain explanations about objects and natural phenomena and also for discovery activities(15)

# 4. Conclusion

This study concludes that the teacher's perception of the integration of the Science Technology Society (STS), namely learning activities that focus on teaching science and technology in the context of experience and everyday life, with a focus on issues/problems that are being faced by society, both in terms of local, regional, national, and global components that have science and technology components. The advantage of the Science Technology Society (STS) is that it can train students' critical thinking skills. This approach's weakness is that some schools' supporting facilities are lacking or almost non-existent, which is an obstacle for the Science Technology Society (STS). Cost is an essential factor in the implementation of the Science Technology Society (STS). Costs are needed to support the implementation of learning.

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