

## **PROFILE (KNOWLEDGE, ATTITUDE, AND PRACTICE) OF SUSTAINABLE SCIENCE TEACHER AT JUNIOR HIGH SCHOOLS IN RIAU TOWARDS THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)**

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### **Abstract**

This study aims to describe the profile of junior high school science teachers in Riau Province toward the Sustainable Development Goals (SDGs). This study used a survey method, involving 40 respondents of science teachers who are members of the Indonesian Science Educators Association (PPII) Riau region. Research data were collected using a questionnaire to measure the profile (knowledge, attitudes, and practices) of science teachers about the SDGs. The results showed the percentage of the average score of science teachers was 81.5% for the knowledge aspect, 85.63% for the attitude aspect, and 80.88% for the practical aspect. In general, the profile of science teachers regarding the SDGs is in the high category. Various efforts are still needed science teachers' understanding of the SDGs is more comprehensive and can be taught to students in science subjects at school.

Keywords: Educational for sustainable development, Sustainable development goals, Sustainable science teacher.

## 1. Introduction

The Indonesian education curriculum does not specifically mention the Sustainable Development Goals (SDGs). However, it is essential for integrating the curriculum into various subjects [1]. The three dimensions of the SDGs, i.e. the economic, social, and environmental dimensions, are taught separately in various high school subjects [2]. But, these three dimensions are not found in specific subjects at the junior high school level. Science learning in junior high school is mostly done thematically. In junior high school, the issues raised by the SDGs can be used as the theme of science subjects to increase awareness of sustainability issues. Continuous awareness is needed by students, as well as by science teachers to achieve the SDGs. Thus, the implementation of SDGs quality education at the national level still leaves a lot of homework. One of them is the participation process itself in the form of legal standing in the curriculum [3].

Indonesia faces challenges in implementing the SDGs [4]. The main obstacle to implementing SDGs 2030 in the education sector is the quality of education and the quality of teachers [5]. Thus, all problems hindering the implementation of the SDGs in Indonesia must be immediately resolved. UNESCO as the agency assigned to oversee the implementation of the SDGs throughout the world must contribute to assisting, especially in Indonesia in the field of education. Thus, the quality of education for all, improving the quality of education is minimal at the level of basic education (elementary school, junior high school, and high school) and the quality of literacy for all in Indonesia can be achieved. The government must conduct socialization systemically and evenly among various parties, including educational institutions. This study aims to describe the profile of junior high school science teachers in Riau Province toward the SDGs. It is hoped science teachers can have a thorough understanding of the SDGs concept and internalize the concept within themselves. Furthermore, science teachers can teach it to students in junior high schools, especially students in Riau Province.

## 2. Literature Review

SDGs consist of environmental, economic, and socio-cultural dimensions as a global agenda. The UN SDGs 2030 agenda envisions a future with equity, justice, and inclusive prosperity within environmental boundaries, and places an important emphasis on education as stated in Goal 4 [6]. SDGs are media in presenting a sustainable view to the global community in an area that has never been touched before, with the main focus on the implementation of change in society [7]. The SDGs have 17 goals and 169 global movement targets that must be achieved by 2030 (See Fig. 1) [8]. The 17 goals of the SDGs are (1) No Poverty; (2) No Hunger; (3) a Healthy and Prosperous Life; (4) Quality Education; (5) Gender Equality; (6) Clean Water and Proper Sanitation; (7) Clean and Affordable Energy; (8) Decent Work and Economic Growth; (9) Industry, Innovation and Infrastructure; (10) Reducing Gaps; (11) Sustainable Cities and Settlements; (12) Responsible Consumption and Production; (13) Climate Change Management; (14) Ocean Ecosystems; (15) Land Ecosystems; (16) Peace, Justice and Strong Institutions; (17) Partnership to Achieve Goals [9]. SDGs implementation requires continuous participation from all individuals and community groups in formal, informal, and non-formal ways [10].



Fig. 1. 17 Symbols in SDGs (adopted from the reference [13]).

### 3. Research Method

This study used a survey method, conducted using google form (online survey). The assessment instrument used was adapted from reference [11]. Data collected using an assessment was adjusted to the aspect being measured. The knowledge aspect was measured using yes and no statements, while the attitude aspect used a Likert scale assessment which measures the level of agreement with the given statement. The practical aspect was measured using a Likert scale, which measured the frequency of the teacher doing practice on the given statement. The research was conducted on science teachers in Riau, Indonesia, who are members of the Indonesian Science Educators Association (PPII) Riau region. The statements on the instrument are divided into 3 aspects (see Table 1). Data was collected and categorized in the following range: > 80 is excellent, 60-80 is very good, 40-60 is good, 20-40 is fair, and  $\leq$  20 is poor.

Table 1. Aspects of the science teacher profile on the SDGs.

No.	Aspect	Question Item	Item
1.	Knowledge	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	10
2.	Attitude	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	10
3.	Practice	21, 22, 23, 24, 25, 26, 27, 28, 29, 30	10

### 4. Results and Discussion

30 items were grouped into 3 aspects, i.e. 10 statements of 'yes' or 'no' statements about science teachers' SDGs knowledge, 10 statement items related to science teachers' attitudes toward SDGs, and 10 statements about science teachers' SDGs practice. The results of the average answers from science teachers on these 3 aspects are shown in Fig. 2. In general, the profile of science teachers regarding the SDGs is in the high category. This is in line with the results of research which states the level of students' awareness about sustainability is high [3, 9]. Students taught by secondary school science teachers have high levels of environmental awareness of the concept of sustainable development [12]. These three aspects can be achieved in various ways, one of which is through education. Education is recognized as a method to achieve the SDGs in items 4 and 7 (see Fig. 1) [7].

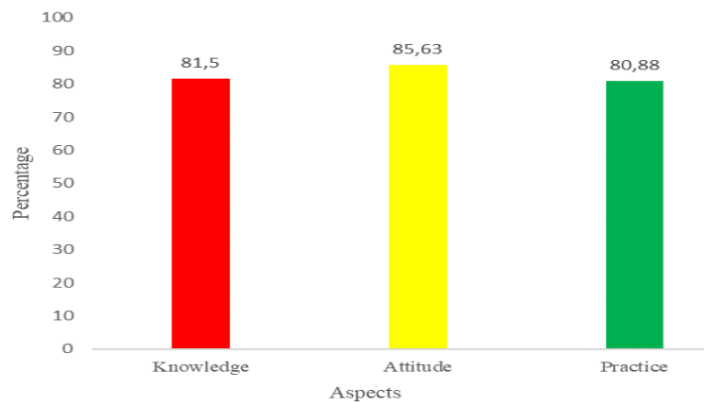


Fig. 2. Average percentage of science teacher profiles on SDGs.

#### 4.1. The aspect of knowledge of SDGs

The knowledge of the SDGs aspect was tested with 10 'yes' or 'no' statements about the concept of Sustainable Development Goals (SDGs). The answers from science teachers are as shown in Fig. 3. The average percentage for the SDGs knowledge aspect of science teachers who are members of PPII in the Riau region is generally categorized as excellent (81.5%). However, the core statement regarding the SDGs concept, most science teachers do not know it. Some statement items have a perfect score of 100%, such as Items 5, 7, and 10. Those are; science teachers already know the important elements of a nation, education is a must in realizing the SDGs, and maintaining good relations with neighboring countries is important to maintain peace throughout the world. This is because those three items are generally known by people from news in printed and electronic media. The two items with the lowest "yes" percentages are item 2 (55%) and item 4 (30%). More than half of the respondents have never heard of the term SDGs before. In fact, for item 4, which mentions the 17 goals of the SDGs, only 30% of respondents know about it.

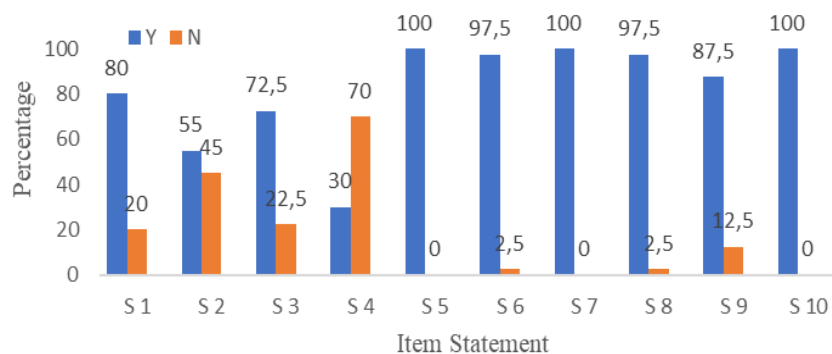


Fig. 3. Percentage of science teachers' knowledge of SDGs.

#### 4.2. The aspect of attitude toward SDGs

The aspect of science teachers' attitudes towards SDGs was tested with 10 items measuring their level of agreement with the statements given (See Fig. 4). The 2 items that have the highest percentage are in item 12 (72.50%) the community

should be provided with the best free basic health services and item 17 (70%) people who have different cultural backgrounds should be treated with the same respect. Science teachers have a very positive attitude toward public health and how health services can be provided for free or through various assistance programs from the government. For item 17, it is very understandable because in the following eastern culture there is no racist term for Indonesian people as people from various cultures in Indonesia are very welcome and treated equally.

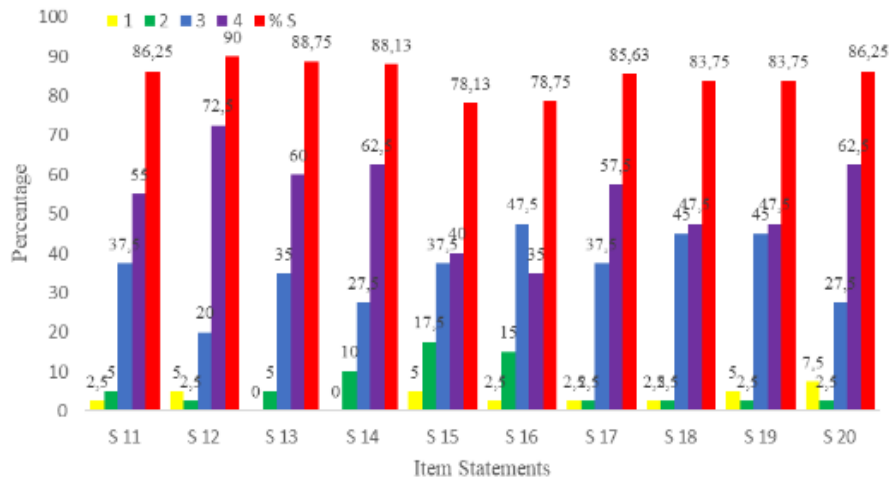


Fig. 4. Percentage of science teacher attitudes towards SDGs.

### 4.3. The aspect of practice on SDGs

The aspect of science teachers' practice of the SDGs was tested with 10 items measuring the level of frequency of doing or implementing the statements given (see Fig. 5). The highest percentage is in item 27 (87.50%) "I turn off the AC and class lights after class ends". This shows science teachers have carried out one sustainable practice, such as turning off air conditioners that are not used anymore to save electricity. The lowest percentage is item 25 (12.5%). Many science teachers use private transport compared to public transportation. However, emotionally, they have a high concern for environmental problems [13]. This is in line with the results of the study which showed the difference in the percentage level of sustainability awareness between two groups of students where the most different percentage was in the aspect of awareness of sustainability practices [14]. Another study revealed there are five best sustainable living practices for students [15]. SDGs can be achieved through education, known as Education for Sustainable Development (ESD) which carries transformation to achieve a sustainable society [16]. Science teachers are expected to be able to teach High Order Thinking Skills (HOTS) through ESD-based science learning to students. HOTS is the top of the hierarchy in cognitive processes and students who are trained to think show positive results in their educational development [17]. For science teachers, it is important to carry out teacher training frequently. Training must be done by teachers to support their professional careers. Investigations into the relationship between some professional development activities and specific teaching practices associated with early reading instruction found a relationship between what teachers learned

and how they later teach [18]. Thus, it is undeniable science instruction based on ESD and SDGs is a learning approach that needs to be developed broadly and comprehensively to face the challenges of 21st-century learning. ESD and SDGs-based instructions will certainly experience many challenges. This challenge is to streamline training and development programs related to ESD and SDGs into lessons for science teachers. The participants of the training can be selected from representatives of the Science Subject Teacher Conference (MGMP), which later is expected to be able to convey what they have learned to their fellow MGMP in their area. Thus, the concepts of ESD and SDGs are massively and evenly understood by all science teachers. Four elements must be involved to overcome the various challenges and problems faced by science teachers (see Fig. 6).

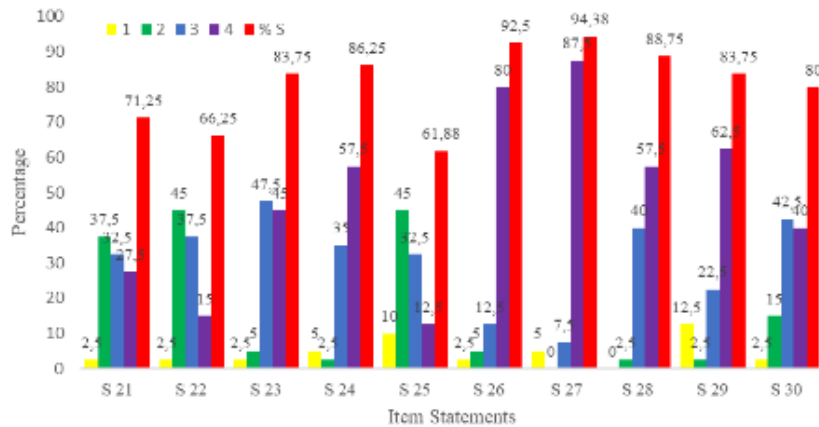


Fig. 5. Percentage of science teachers' practice of SDGs.

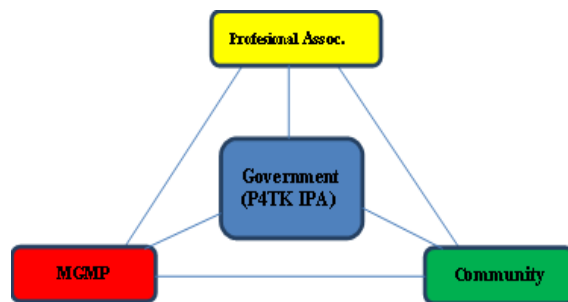


Fig. 6. Four parties that play a role in the development of a science teacher's ESDs career (adapted from reference [19]).

Collaboration is highly recommended to overcome challenges and problems in science instructions, including those which are based on ESD and SDGs. The misunderstanding of science teachers about the application of ESD and SDGs in science classes can be overcome in several ways, such as inviting a science educator professional association or inviting experts from the government that can organize training related to ESD by collaborating with the Indonesian Science Educators Association. After that, the next step is that MGMP can hold discussions regarding the implementation of ESD in science learning, of course, it is more applicable. Such as the making of ESD-based or SDGs science lesson plans in actual classroom

situations. They observe the lessons from the model teacher and then reflect to find strengths and room for improvement. The implementation of science learning touches on real problems that exist in society and can involve various communities in society in this step, an expert (from the university) can also be involved. To ensure the effectiveness of the training program, monitoring and evaluation should be carried out. To achieve a deep and broad implementation of ESD into all forms of education, the capacity of educators and trainers needs to be increased [18-21].

## 5. Conclusion

In general, the sustainability profile of junior high school science teachers who are members of the PPII in the Riau region is relatively high. This is indicated by the high percentage of knowledge, attitudes, and practices toward the SDGs. Various efforts can be made to increase their understanding of ESD and SDGs. One of the efforts made is to involve various elements such as the government through P4TK IPA, professional associations such as PPII and MGMP, as well as private practitioners. In addition, including SDGs in the national curriculum is something very important.

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