

# Comparative Study of Environmental Literacy Between Teachers and Students at Coastal Area

Roshayanti, Fenny<sup>1\*</sup> Wicaksono, Azizul Ghofar Candra<sup>2</sup> Minarti, Ipah Budi<sup>3</sup>  
 Nurkholis<sup>4</sup>

<sup>1</sup>*Departemen Pascasarjana, Universitas PGRI Semarang, Semarang, Indonesia*

<sup>2,4</sup>*Departemen Pascasarjana, Universitas PGRI Semarang, Semarang, Indonesia*

<sup>3</sup>*Departemen Pendidikan Biologi, Universitas PGRI Semarang, Semarang, Indonesia*

*\*Corresponding author. Email: fennyroshayanti@upgris.ac.id*

## ABSTRACT

The damage of environment right now being the concern of many institutions including the schools. The schools that provide good learning environments will give a great contribution in solving environmental issues by creating pro-environmental generations. Thus, the schools play important role in giving a long term solution to the environmental issues. This research was aimed to measure the level of environmental literacy comprehension in Teachers and students in senior high schools in coastal area. This research used quantitative approach to examine the level of the environmental literacy in students and teachers. The t test analysis was used to show the differences between students and teachers in environmental literacy comprehension. In addition, correlation and regression test were used to show the relation between teacher's environmental literacy comprehensions with the student's environmental literacy comprehensions. This research involved 40 students and 41 teachers from high schools in coastal area. The score of environmental literacy was taken using Middle schools environmental literacy surveys (MSELS) questionnaires. The result shows significant value as 0.643 ( $p > 0.05$ ) that there are no differences between teachers and students comprehension in environmental literacy. In addition, correlation-regression analysis also shows  $R = 0.201$  with sig. value as 0.209 ( $p > 0.05$ ). This result indicates that there are no correlations between teacher's environmental literacy comprehensions and student's environmental literacy comprehensions.

**Keywords:** *environmental literacy, teachers and students, high school*

## 1. INTRODUCTION

Environmental problem is one of the critical issues that need to solve. Many environmental problems, such as Pollution, chemical waste, aberration, global warming give massive damage to human and also organism life. All of these problem need to be solve in order to give better live for the new generation. However, the fact that not all of people in community aware of that issues. The low understanding and attitude of the people in community about the environment is one of the causes that make this these environmental problems growing bigger. Thus, introducing environmental literacy in the community can be an alternative problem solving and it had been done in several countries. Not only in Indonesia, environmental problems have now become global issues; almost all countries have the same problem. However, in some other countries, environmental problems such as pollution, abrasion and ecosystem imbalances become serious topics of concern, indeed the environmental literacy should be implemented in early education. In America, for example, introducing environmental literacy is no longer merely giving knowledge, but has been directed towards the actualization of attitudes and actions; media

strategies to enhance adult environmental knowledge; understanding of environmental education; teaching the effect of environmental education on adolescents; instilling the long-term value of environmental education; and have good planning for increasing environmental literacy [1].

Implementing the values and principles of environmental literacy for the community is should be done effectively through education because schools have a strategic position as agents of change in the future. In order to change the paradigm in environment and also to increase the awareness and also behavior of the people in community toward the environment, all of element including the schools is needed. The schools can be a central point in introducing environmental literacy. Education is one aspect that can affect the world of the future and is the most effective way in shaping a society in order to face challenges in the future [2]. One of the most important parts of the schools that support the development of environmental literacy in students is learning activities led by the teachers. The teacher has the authority and responsibility to create an atmosphere of learning environment that is capable of supporting the development of student environmental literacy. Of course, to

be able to develop student environmental literacy, teachers must also have a strong foundation in environmental literacy too.

In addition, the teacher's competency will influence their ways to conduct the learning environment. The teachers knowledge both theoretically and practice will result in the flexible knowledge to successful teaching process [3][4]. The teachers successful in teaching is determine not only their skills in pedagogy but also their knowledge in the subject matter [5]. There are also some findings that showed relationship between teachers knowledge and ability and students skills acquisition whether in reading skills, cognitive thinking, or in their attitude and behavior [6]. Thus, observing teachers environmental knowledge is important to give insight in how teachers development process should be design and also how their impact to the students and for community in the future.

## 2. METHODS

This research was categorized as survey with descriptive approach and quantitative analysis. This research was focused on exploring teachers and students environmental literacy comprehension. This research involved 41 students and 40 teachers in Senior High School located in coastal area of Central Java, Indonesia. All of the teachers and the students given MSELs (Middle School Environmental Literacy Survey) questionnaire [7] which are divided into 7 indicators including ecological knowledge (17 items), issues identification (3 items), issues analysis (6 items), personal attitude to environment (12 items), willingness to act (11 items), verbal commitments (2 items), and actual commitments (12 items). Some modification also was made in the structure of MSELs in order to adjust the real condition in northern coastal area of Central Java, thus the questionnaire became more representative based on the real issues. During the research process, the instrument were validate and tested with reliability test. The data gathered then analyzed using descriptive statistic and categorized by five levels as excellent (81%-100%), good (61%-80%), adequate (41%-60%), less developed (21%-40%) and worst (less than 21%). In addition, the data were analyzed by t-test to measure the different between teachers and students in environmental literacy, then correlational analysis also used to discover the correlation between teachers and student's environmental literacy, and to explore how teacher's comprehension in environmental literacy can affect their student's environmental literacy as well.

## 3. RESULT AND DISCUSSION

The teacher and students give similar result in their comprehension in environmental literacy. The average of teacher's environmental literacy is 59.47 (adequate), while the students have average score as 65.77 (good). However, the statistical result shows Sign. value as 0.643 ( $p > 0.05$ ) that prove there is no difference between teachers and students environmental literacy comprehension. When it seen in every indicators, teacher's ecological knowledge has good score ( $M=65.04$ ,  $Sd= 12.27$ ) and students also get good score ( $M=72.60$ ,  $Sd=10.97$ ). In the term of Issues identification aspects,

the teachers get adequate score ( $M=46.93$ ,  $Sd= 18.37$ ) but the students get the lowest level ( $M= 26.00$ ,  $Sd= 29.43$ ). The teachers get good level in analyzing environmental issues ( $M=60.52$ ,  $Sd=30.86$ ), but students get higher result ( $M=73.21$ ,  $Sd= 26.25$ ). Furthermore, in attitude toward environment, the teachers give good response ( $M=74.31$ ,  $Sd=7.57$ ) and also the students ( $M=69.56$ ,  $SD= 6.55$ ). Then, for willingness to act for environmental defense, the teacher give adequate score ( $M=54.65$ ,  $Sd= 9.55$ ) and students also give adequate response ( $M= 56.34$ ,  $Sd= 8.72$ ). The teacher give adequate verbal commitment in solving environmental issues ( $M=59.09$ ,  $Sd= 9.35$ ) and so with the students ( $M=54.39$ ,  $Sd= 5.93$ ). Moreover, for the behavior toward environment, both teachers ( $M=70.20$ ,  $Sd= 11.36$ ) and students ( $M=70.53$ ,  $Sd=6.87$ ) give similar response in a good level (Figure 1).

Based on the data above, it seen that the students environmental literacy is higher than teachers environmental literacy comprehension even it not significantly different. In the teachers perspective, the average score of environmental literacy aspects is quite similar. Among the seven indicators, the personal attitude toward environment is the highest score in teacher's environmental literacy comprehension. However, the lowest score of teachers environmental literacy is issues analysis and willingness to act. That's result explain if the teachers aware of the environmental issues around them, but it still hard for teachers to analyze it, giving solution and doing some action to solve environmental issues. This result is also happened in some countries that the teachers shows good level in attitude and awareness on environmental issues but lack of behavior toward those issues [8]. Thus another factor such as the teachers background knowledge and education also contribute in shaping teachers environmental literacy attainment [9][10]. It seems that teachers in science background have a potential to express better environmental literacy comprehension. Some study also found that biology teachers that studied about environment and ecology in their university had better understanding of environmental literacy that chemistry teachers that did not studied a lot about environment [11]. This condition should be a concern because the teachers skills in environmental literacy will influence how much the teachers give the guidance to their students in that topic [12]. The fact that's there is no difference between the teachers and students environmental literacy and both of them are in a middle level of environmental literacy strengthen an idea that all of teacher's ability are transferred during learning process to their students. The better teacher's ability in one context give the better learning process and also the better students acquisition of that topic [13]. The adequate level of environmental literacy in the teachers should be a great attention for all educational stakeholders. The teachers ability is the fundamental aspect of learning process in the classroom. Thus the one who gave better learning environment and learning content, they will contribute in greater output in student's education.

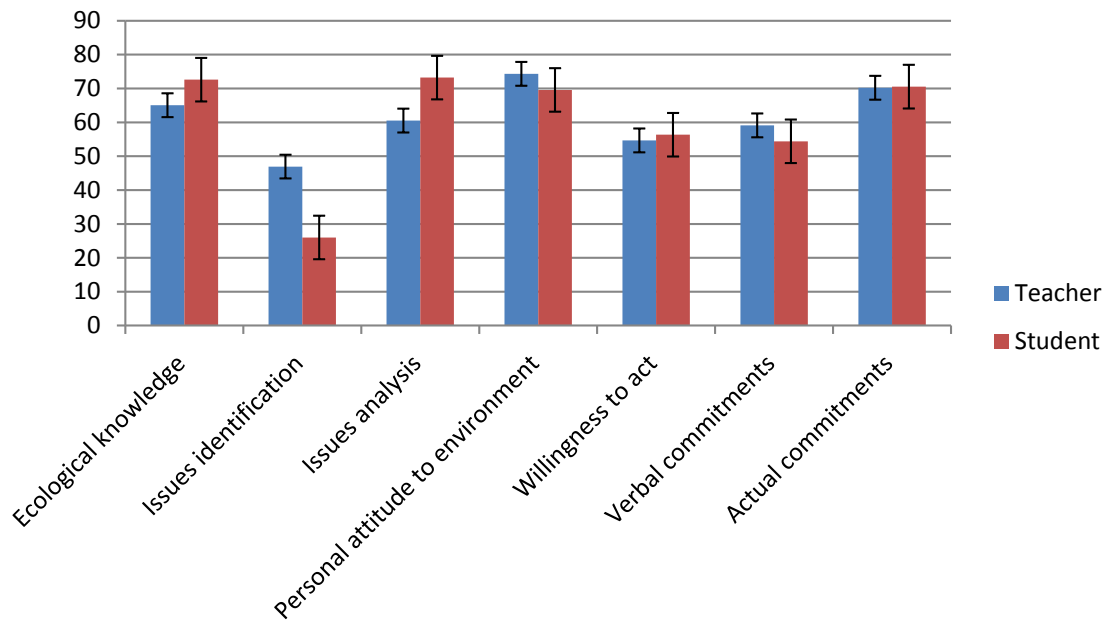


Figure 1 The result of teachers and students environmental literacy

Table 1. correlation result of environmental literacy aspect in teachers and students

Indicator		SPE	SII	SIA	SAE	SWE	SVC	SAC
TPE	Pearson correlation	-.127	.326*	.018	-.034	.160	.131	.190
	Sig. (2-tailed)	.430	.038	.909	.832	.317	.414	.233
TII	Pearson correlation	-.051	.155	.059	.087	.165	-.145	.133
	Sig. (2-tailed)	.753	.332	.715	.589	.302	.366	.406
TIA	Pearson correlation	.264	.143	-.028	.142	.021	-.037	-.093
	Sig. (2-tailed)	.096	.372	.862	.377	.895	.819	.562
TAE	Pearson correlation	.136	.115	.145	-.143	-.339*	.227	.013
	Sig. (2-tailed)	.395	.473	.365	.372	.030	.154	.938
TWE	Pearson correlation	.148	.004	-.068	-.118	.053	.162	-.116
	Sig. (2-tailed)	.356	.980	.673	.461	.741	.313	.472
TVC	Pearson correlation	.144	.083	-.013	-.028	-.050	-.017	-.099
	Sig. (2-tailed)	.368	.606	.934	.863	.755	.916	.538
TAC	Pearson correlation	.144	.093	.102	-.119	.033	.195	-.031
	Sig. (2-tailed)	.369	.564	.526	.457	.839	.222	.845

Note: teachers ecological knowledge (TEC), teachers identification issues (TII), teachers issues analysis (TIA), teachers personal attitude to environment (TAE), teachers willingness to act (TWE), teachers verbal commitments (TVC), and teachers actual commitments (TAC). students ecological knowledge (SEC), students identification issues (SII), students issues analysis (SIA), students personal attitude to environment (SAE), students willingness to act (SWE), students verbal commitments (SVC), and students actual commitments (SAC).

Meanwhile, in the term of student’s environmental literacy, it can be seen that the highest score is in ecological knowledge and analysis skills and environmental behavior. However the lowest score of environmental literacy is in issues identification aspects. It is a unique result, because even the students know well about ecology, they don’t know how to identify the ecological issues. They have difficulties in identify what is the main cause, the victim and the impact of

environmental problem to human and another living things and how don’t have any ideas in how to solve it. The students thinking abilities in analyzing and identifying some problems is the most problem encounter by any educators, especially in specific content such as environment [14][15]. The environmental problems are real and happened around them. It is necessary for students to learn a lot about environmental issues and how to solve them in a proper

ways. Environmental issues are considered as a complex topic. It involves a lot of aspects and approached to solve whether in science or non-science point of views. That is why it difficult to solve, it require a lot of knowledge and experience and also need high thinking skills. The low score of students in issues identification result implies that the students are lack of higher thinking ability. That means the students need to be exposed by a variety of environmental topic. In addition the teachers need to implement any strategies and materials that support environmental literacy. It is also good to involve parents in environmental education program held by the schools [16][17].

Furthermore, correlational analysis shows that there is no correlation between teachers and student's environmental literacy with correlation score  $R = 0.201$  with sig. value as  $0.209$  ( $p > 0.05$ ). The detail result of correlation between teachers and student's environmental literacy is given in table 1. Within all of environmental literacy aspects, it was seen that the teacher's ecological knowledge has correlation to student's Issues identification skills in environmental issues.

In addition, regression analysis for relation between teacher's ecological knowledge and student's environmental issues identification is given below (table 2). The value of R square reach 0.106 or 10.6% that makes teachers ecological knowledge give impact as 10.6% on students skill in identify environmental issues.

**Table 2. regression analysis for teacher's ecological knowledge and student's environmental issues identification**

Model	R	R square	Adjusted R square	Sign.
1	0.326	0.106	0.081	0.038

The teachers knowledge about ecology and environment show good correlation with students issues identification skills. That means teachers knowledge play key role in promoting students skills in thinking process such as issues identification. Some research also found that there are complicated relationship between basic environmental knowledge of teachers and students view about environmental issues and environmental knowledge as well [18]. But the fact that issues identification is the lowest score of students skills among seven environmental literacy aspects, that means insufficient teachers preparation to deliver their knowledge and guidance become one factor that affect the weakness of environmental literacy acquisition of Students [19]. The teachers should set a good objective to their learning environment, apply various teaching methods, build discussion form for students work, test and create materials, teach in a proper way and best manner and also maximize teaching time with the best learning atmosphere [20]. The teachers also need to assign student's work that will influence the student's interest in learning, monitor and evaluate their progress, set evaluation criteria inform the students about it, and also the teachers have to provide feedback for their students [21].

#### 4. CONCLUSION

This research shows that the teacher's environmental literacy is in adequate level (59.47), while the students have average score as 65.77 (good level), even though their score is not significantly different according to the statistic test ( $p > 0.05$ ). All of environmental literacy skills in teachers are remains the same for all indicators. But, students have different result, where the lowest score of student's environmental literacy is in issues identification (26.00/less developed) and the highest score is in issues analysis (73.21) with good category. However, the teacher's ecological knowledge has positive correlation with student's issues identification skills in environmental context. This result implies that the teachers knowledge in environmental literacy is important to support their pedagogical knowledge and giving best learning environment to their students. It also needed to integrate environmental literacy in the classroom supported by the schools programme.

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