Scientific Learning Based on Moral Literacy to College for Smart and Good Citizen in Indonesia

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Abstract. The global idea of moral literacy is a form of developing knowledge by not leaving the noble values of the each nation. Moral literacy is important for college student as moral literacy products to be good and smart citizens, because to get it students must have good skills of moral literacy. Purpose of this research is to look college students moral understanding in scientific learning based on Moral Literacy to creates smart and good citizen in Indonesia. Research method uses descriptive quantitative. Data collection techniques carried out by interview, observation, documentation and questionnaire. Research objects were PGSD students in Yogyakarta (Central Java) and Cirebon (West Java). Results showed that understanding of PGSD's student moral literacy in scientific learning are varied. Percentage of research results shows, more than 75% of students have learning power accordance with the indicators studied, which developed from scientific learning based on moral literacy. The conclusion of this research is that scientific literacy based on moral literacy for student college to creates smart and good citizens in Indonesia needs to be developed massively. Through this article, researchers study to be able to learn more about scientific literacy based on moral literacy for students who are mostly prospective teachers.

Keywords: Scientific Learning, Moral Literacy, Smart and Good Citizen.

1 Introduction

The idea of moral literacy is a form of developing knowledge by not leaving the noble values of the nation.Currently the world of education is experiencing a wave of the industrial revolution 4.0. According to Risdianto, the industrial revolution also contributed to changes in the development of the education system[1]. One of the changes is related to an adjusted curriculum from time to time. At present elementary school education in Indonesia applies the 2013 curriculum which is implemented by developing scientific-based learning models (Discovery/Inquiry Learning, Problem Based Learning, and Project Based Learning) and various literacy learning.Halstead and Pike write, citizenship and moral education are areas where many teachers may experience fairly high levels of anxiety and there may be several reasons for this [2]. Agree with them, that the shift in moral values inherent in students sometimes becomes a concern for the teacher. Teaching moral values can be taught through literacy learning. One of the literacy learning that must be introduced to elementary school children is moral literacy, so that equality occurs between academic values and moral values in students. Tuanawrites, Moral literacy involves three basic components: ethics sensitivity; ethical reasoning skills; and moral imagination [3]. Of course this should be taught as a step towards an Indonesian nation that Smart and Good Citizen.

The development of technology, requires humans to move dynamically to follow the era. Modernity brings various impacts as we all know, one of the impacts is the moral degradation of the nation. Moral degradation ignited the flames of national disunity, so that education is needed that can deliver Indonesian children to Smart and Good citizens. Mutohar said, one form of moral degradation in Indonesia is the concept of decency morality becomes loose [4]. That was caused by the influence of western culture that entered through the use of gadgets and other technologies. Most of the research on scientific learning in Indonesia has not linked activities with moral literacy learning that specific enough to creates smart and good citizen that divisive riject and able to hoax reject.Previous research on scientific literacy, among others.Aisyah, etc in the study "Learning scientific literacy in form of comics" with the characteristics: 1) developing indicators and aspects of scientific literacy, 2) presenting material in the form of science fiction genre stories, 3) having characters that adopt the level of scientific literacy, 4) has an optional story, because it depends on the questions asked to develop scientific literacy in terms of content, context, process and attitude to produce based on due diligence, the product is suitable for use [5]. Meanwhile, the O'Leill & Polman practice-based scientific literacy research, carried out in three case studies involving students in the formulation of research questions and analysis strategies produced more empirical data. This study also shows failure to involve students in the formulation of research can result in loss of agency [6]. Other studies conducted by emphasizing research skills using laboratory instruction have found that students who use the discovery/inquiry learning model get good confidence in scientific abilities [7].

This research was conducted to elementary school teacher education on student's college, or Indonesia called Pendidikan Guru Sekolah Dasar (PGSD). With expectation so that candidate of elementary school teachers have a high sense of nationalism. With high awareness, having national values, and being able to apply, it is hoped that students will become young generation who can build Indonesia optimaly. Through scientific learning in Higher Education based on moral literacy is expected to be able to give birth generations of millennial teachers who are included in smart and good citizens. Rizzo and Bajovic write, smart and good characters consist of knowing the good, desiring the good, and doing the good. These indicators become benchmarks in smart and good citizens [8]. Character education in moral literacy is defined as a deliberate attempt to develop characters in everyone as individuals and are widely used in society. Kaur write, moral education is whatever schools do to influence how students think, feel, and act regarding issues of right and wrong [9]. So it can be said, that educational institutions have a considerable impact in shaping the nature of student attitudes. So to form children in primary schools who are aware of moral literacy, a generation of primary school teachers must be built who understand the moral literacy.

Wardhani, etc write, teachers have a serious role as a moral agent, they must be able to understand the change in the development of reasoning morality [10]. Wardhani's explanation confirm the opinion that Millennial Teachers are moral agents in schools and communities. Bajovic and Elliot write, teachers also need to recognize their moral responsibilities as ethical professionals [11]. So the teacher's awareness must be built since the lecture period so that they are ready to work with high awareness.Specifically, this research aims to investigate scientific-based moral literacy for tertiary institutions for smart and good citizens in Indonesia. The basic argument of this research is that scientific learning based on moral liability can strengthen the realization of smart and good citizens in Indonesia.

Some previous studies that have examined scientific learning include, Marilyn Fleer examines the philosophy of the teacher and pedagogical practices in the context of the formation of children's concepts in the environment of early childhood [12]. Second, Ton De

Jong and Wouter R. Van Joolingen research about scientific learning in supporting independent and constructive learning [13]. Third, Fleer M. examines the impact of scientific learning programs on the families of children attending the Australian Child Care Center [14]. Fourth, Kayte Edwards and Judith Loveridge researched scientific learning for children from the practitioner's point of view [15]. Research conducted by researchers, referring to previous studies has several aspects of renewal. First, based on the study, the study is a scientific learning based on moral literacy to colleges for smart and good citizens in Indonesia, specifically the research conducted on Elementary School Teacher Education (PGSD) students. Second, based on location, the location of this research is centered at the University of Muhammadiyah Cirebon which is a city located on the north coast of Java and is one of the busiest cities in Indonesia.

2 Methods

Determination of the research sample using purposive sampling techniques, with consideration tailored to research needs. The research sample was chosen with consideration based on the year of the student's admission force, randomly selected until a sample of 100 respondents was obtained. The instrument used was a closed questionnaire. The preparation of the instrument is based on the indicators of each variable.

Research method uses descriptive quantitative. Data collection techniques carried out by interview, observation, documentation and questionnaire. Descriptive research was conducted with the aim of describing the conditions found in the field with the principle as is. According to Cooper, descriptive research was conducted to determine the value of independent variables without being compared or connected with other variables [16]. So with the aim to find out the role of students in scientific learning personally, the descriptive research method is considered to meet the research needs. Besides Creswell etc said, descriptive research is a research method that tries to describe and interpret objects honestly [17]. Steps or research techniques to meet the needs of descriptive research are interviews with interview guidelines, observations with observation guidelines, and documentation. This is done with the aim that data obtained can provide a systematic description of the facts of the object of research appropriately. The accuracy of the data is obtained through documentation techniques, by recording through field notes sheets and the help of audio recording devices. This step is chosen so that the data obtained is complete data that minimizes the error in recording the research process. The statement indicators in questionnaire can be seen in Table 1.

Qualitative research methods were conducted with the aim of obtaining data in the form of figures obtained after distributing questionnaires to students as research objects. Qualitative research methods carried out provided with survey techniques. Survey research is carried out by distributing closed questionnaires to research objects. Data collection techniques by qualitative survey utilizing questionnaires as a source of data, and has been widely used in educational research. Similar to the type of descriptive research, research with survey techniques also aims to collect original data (original data) to describe the data obtained from the research object.

Sudaryono said, in the field of education research surveys can be used to analyze the relationship of simple variables to complex variables [18]. So the combination of quantitative descriptive methods in research is deemed able to meet the needs of research, where the analysis is conducted to see the influence of scientific learning based on moral literacy to meet the goal of creating smart and good citizens.

Data analysis using data reduction, data presentation, and drawing conclusions. Data reduction is a form of data analysis that works by classifying data, and organizing data in such a way as to verify and draw research conclusions. El-Hasnony, etc said, data reduction acquires a decreased representation for the data sets that have smaller volumes than the original, yet delivers almost the same results or analytical output [19]. The use of data reduction aims to narrow the area of data analysis that will be used as material for analysis and drawing conclusions.

Table 1. Statement Indicator in questionnaire

| Indicator from saintific learning	Statement
Observe	I always observe the object that I will study and always make moral literacy based observation guidelines and adapt to smart and good citizen indicators
	I always arrange data that I will observe and always prepare tools for moral literacy based observations and adapt to smart and good citizen indicators
Questioning	I have a view of a problem, situation, or thing that is an object based on moral literacy and adjusted to the indicators of smart and good citizens
	I can clarify information based on moral literacy and adapt it to the indicators of smart and good citizens
Collecting Information	I think reading can get a lot of information, which I associate with moral literacy and adjust it to the indicators of smart and good citizens
	In my opinion by observing the phenomenon of eating I can obtain information and study it and I associate it with moral literacy and adjust it to the indicators of smart and good citizens
Reasoning	I can relate the connectedness of the facts, and look for whether there is a cause and effect and facts for me to associate with moral literacy and adapt to the indicators of smart and good citizens
	I can explain the scientific phenomena that exist in a phenomenon for me to associate with moral literacy and adapt it to the indicators of smart and good citizens
Communicate	I can write or tell what I found in the information search activities to associate with moral literacy and adapt it to the indicators of smart and good citizens
	I can present a report covering the process, results, and conclusions for me to associate with moral literacy and adapt it to the indicators of smart and good citizens

3   Results and Discussion

Data based on the results of interviews, observations, and documentation shows that students at two universities in Java, Indonesia show a good understanding of students towards scientific learning based on moral literacy. These results can be seen in Table 2. The description of the results of the spread of research instruments in form of descriptive data shows, more than 75% of students are able to meet the indicators studied. These results indicate that students based on the results of interviews and observations show pretty good results on the ability to observe, ask questions, gather information, reason, and communicate.

Table 2. Result recapitulation of interviews and observations

Indicator	Summary findings
The ability to observe students based on moral literacy is associated with smart and good citizen indicators	80% of students are able to conduct observation activities based on moral literacy according to the indicators of smart and good citizens, 20% of students experience problems in observing abilities related to moral literacy
The ability of students in making and arrange questions based on moral literacy before solving problems is associated with indicators of smart and good citizens	83% of students are able to arrange questions based on moral literacy with indicators of smart and good citizens, 17% of students have problems in making and compiling questions based on literacy because of their low literacy abilities.
The ability of students to collect moral literacy-based information is associated with smart and good citizen indicators	88% of students are able to collect moral literacy-based information associated with smart and good citizen indicators. 12% of students experienced problems in gathering information based on moral literacy because of the limitations of students in accessing regular reference sources such as journals and books.
The ability of students to reason activities based on moral literacy is associated with indicators of smart and good citizens	82% of students are able to reason activities based on moral literacy based on good indicators of smart and good citizens. 18% of students experienced problems in terms of reasoning due to the delay in understanding the material.
The ability of students in reporting activities based on moral literacy included in communicating activities is associated with indicators of smart and good citizens	85% of students are able to do moral literacy-based reporting activities related to smart and good citizen indicators. Another 15% are less able to do reporting activities properly because they are less able to communicate in accordance with the indicators of smart and good citizens.

From the results of a questionnaire analysis that has been distributed to PGSD students at Ahmad Dahlan University (Yogyakarta, Central Java) and Cirebon Muhammadiyah University (Cirebon, West Java), the results in Fig. 1. Recapitulation of Scientific Sintax based on Moral Literacy. The results of the interviews illustrate that observing, questioning, gathering information, reasoning, and communicating. The score for strongly agreed answers was 74.58%, the score for agreed answers was 24.94%, the score for not agree answers was 0.48%, and for strongly not agreed answers by 0%. From this percentage, it can be concluded that students have systematic thinking in scientific learning based on moral literacy.
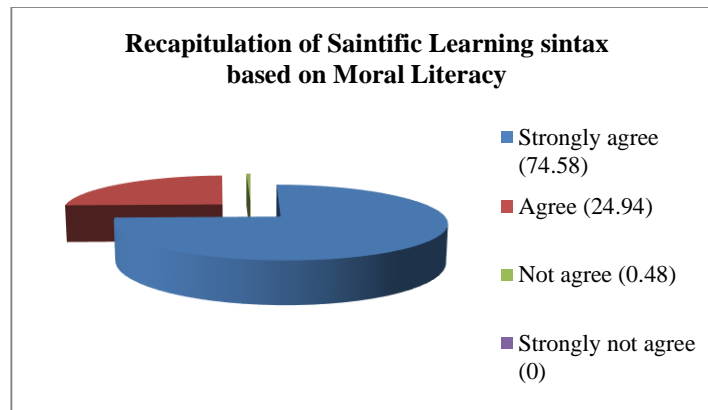
Fig. 1. Rekapitulation of SaintificLearningsintax based on Moral Literacy

Rizzo and Bajovic [8] said, moral literacy effective are practicing teachers in delivering character education presently in our classrooms. Moral literacy learning is more effectively carried out by teacher application, because good learning is done by practice. One expert argues "moral by nature but the question, how to teach children to makesound moral judgments, still causes confusion for many educators. Basically character education through moral literacy seeks to foster good character as a real educational goal. Moral literacyassess students' competencies in understanding, commenting and improving. This ability is intended to train students' ability to reason moral literacy towards smart and good citizens.

H. B explained that moral literacy is still growing, even throughout the world [20]. Bennet argues, when a nation hopes that young people have the characteristics and character in accordance with expectations, then teaching values to them is a must [21]. As explained by Tuana, there are three (3) basic elements of moral literacy namely ethical sensitivity, ethical reasoning skills, and moral imagination [22]. Moral literacy is a form of developing abilities and potentials. Moral literacy can slowly affect a person's attitudes, culture and outlook and ultimately influence his life. In the Education environment, according to Walker, et al., The elements that form the basis of moral literacy associated with school life and society are obtained through learning [23]. In studies that identify the practical implications of the teacher's role in implementing programs related to the development of moral literacy for students, the results show that the need for community involvement in the development of moral literacy as a synergy between programs and teacher behavior, and implementation in accordance with development [24]. In addition, there are also opinions from Normore and Doscher, that the use of mass media, when a moral foundation is inserted, will encourage educational leaders to act with an ethical orientation [25].

Based on the results of research that adjusted to the indicators of smart and good citizens. It can be concluded in "knowing the good" indicator , students are able to analyze the values in moral literacy associated with scientific learning activities. Then in "desiring the good" indicator, students are able to analyze activities that prove they are able to apply the values for desiring the good. As well as in "doing the good" indicators students are able to analogize and adjust the application of these values in everyday life. So based on indicators in smart and good citizens, students can be said to be able to do analysis and application in accordance with the values learned in moral literacy.

4 Conclusion

Based on the results of this research can be seen that scientific literacy can have implications for various aspects. Based on the results of the study, it can also be seen that there has been no research that examines scientific learning based on moral literacy for students to form smart and good citizens in Indonesia. Therefore researchers conducted an inquiry into scientific literacy based on moral literacy for students to form smart and good citizens in Indonesia. The theoretical benefit of this research is that it is expected to be able to provide a theoretical study of scientific learning based on moral literacy for students to form smart and good citizens in Indonesia, especially for teacher students in college. While the practical benefit is that the results of the study are able to be a measure of the development of moral literacy-based scientific learning for students to form smart and good citizens in Indonesia.

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