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## Strengthening Pre-service Teachers' Character: The application of ALLR Learning Model in Basic Science Subject

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### Abstract

Lots of social conflicts related to intolerance cases emerge every year which worries Indonesia's diversity and unity. Thus, the role of higher education institution in realizing a mental revolution is crucial. The purpose of this study is to describe the integration of character education through science subjects. This research was conducted with one group pretest-posttest design that applied the ALLR learning model to integrate tolerance and social justice values in improving students' character while learn science process skills in Natural Science Department of Universitas Negeri Surabaya. The subject is students who programmed Basic Science Subjects. The research design is one-shot case study. The data was collected by observing students activities and the results of group discussion presented in class discussion. The data were analyzed descriptively to explain students' achievement (science process skills and tolerance and social justice values). The results show that students' science process skills are increased during activity 1 and activity 2. Discussion and guidance from lecturer in each activity provides experience to students to solve the problems. In addition, cooperating with other students provides experience for students to socialize by applying values of tolerance and social justice. Students also respond positively to the ALLR learning model. They also think that they have the opportunity to understand more about diversity, social justice, and tolerance value. The conclusion is the ALLR model can be applied for learning science process skills while strengthening students' character.

**Keywords:** ALLR learning model, science process skill, pre-service teacher, tolerance and social justice values

### Introduction

The Indonesian nation has the characteristics of a pluralistic nation that is united with human values based on Pancasila. Tolerance and social justice are important aspects of human values. However, in reality the realization of justice and prosperity for the people of Indonesia is not easy. Various obstacles continue to emerge and cause social conflicts that lead to intolerance and social justice. This is indicated by an increase in cases of intolerance recorded by the National Human Rights Commission through a complaint post of the Freedom of Religion and Belief Desk from 2014 to 2016 (Putra, 2007). This phenomenon is feared to reduce the integrity of the Indonesian people who have a mutual cooperation enthusiasm and work together for the progress of the nation. In dealing with this, a social changes is needed in various components of the nation, state, and society. One of them is to make a mental revolution through character education.

Universitas Negeri Surabaya as one of the higher education institution has a strategic role to prepare pre-service teacher which has good character through character education in accordance with Pancasila, especially the value of tolerance and social justice. This character education is integrated in learning process so that students not only understand about science concepts, but also can improve their character quality (Zuchdi, 2010). This is in line with the goal of science learning which not only

emphasizes mastery of knowledge competencies, but also growth and development of attitudinal competencies carried out throughout the learning process. It is also become the teacher's consideration in developing student character (Carin, 1990; Shumow, 2015). Thus, pre-service teachers should have good characters.

Previous research shows that character education has been carried out by lecturers in the <sup>2</sup>Science Department of Mathematics and Science Faculty of Universitas Negeri Surabaya, but character education related to the values contained in the principles of Pancasila has not been seen explicitly in learning. Character education that emphasizes the meaning of Pancasila values is still limited to the subject of Pancasila and Citizenship Education (Widodo, 2016). Meanwhile, science lessons changes students' personal attributes, affect, and behavior (Kumarassamy, 2019). Character education emphasized in the science subjects is more directed at attitudes that must be owned by someone. Basically, this is indeed related to the values contained in the principles of Pancasila, but the emphasis relating to Pancasila values is not yet apparent (Widodo, 2016). In order to fill this gap, this study was conducted to prepare pre-service students with good characters by implementing the ALLR learning model. The ALLR learning model (Activity Based-Lesson Learn-Reflection) is one learning model that can be used as an option to teach science concepts through student-centered activities while integrating character education, especially the value of tolerance and social justice of Pancasila (Widodo, 2018a)

<sup>3</sup>The purpose of this study is to describe the application of <sup>10</sup>character education integration in science subjects, namely the Science Basic Course, to improve science process skills of pre-service teachers while strengthening the character of pre-service science teachers using the ALLR learning model. This research was conducted to determine the effectiveness of the ALLR Learning Model in achieving learning objectives related to mastery of the science concept and strengthening the value of tolerance and social justice of pre-service science teachers.

The ALLR learning model consists of stages as follow: (1) student orientation on the phenomenon or problem to be investigated, (2) designing the process of investigation or problem solving, (3) guiding the investigation activities or the application of problem solving methods, (4) presenting the results of investigations or problem solving , (5) taking the value of the lesson, and (6) reflecting lesson process (Widodo, 2018b). The selection of the ALLR learning model is because in the ALLR learning model students carry out investigation and problem solving activities. Investigating problem to solve it can practice science process skills and are easier to receive learning material (Prasasti, 2017). Students will become independent learners if learning is centered on students and the teacher acts as a facilitator (Subanji, 2010). In addition, the integration of positive attitudes during learning through student-centered activities will foster a positive attitude towards students (Zuchdi, 2010).

The use of the ALLR Learning Model is expected to improve science process skills of prospective science teacher students while strengthening the value of tolerance and social justice during the learning process. Furthermore, pre-service science teachers increasingly recognize the importance of maintaining values of tolerance and social justice in their interactions in everyday life. Pre-service teachers are also expected to be able to take lessons from the topic they have learned and to link them to values of tolerance and social justice.

## Method

This research was conducted with one-shot case study design that applied the ALLR learning model to integrate tolerance and social justice values in improving students' character while learn science process skills in Natural Science Department of Universitas Negeri Surabaya. The subject is students of Kelas Unggulan who programmed Basic Science Subjects. Kelas Unggulan is a class that is prepared students to be a teacher with global capacity, such as English communication. This Class consists of 20 students which are divided into four groups. They studied basic concepts of science related to capillarity and greenhouse effects topics within two weeks. During those two weeks they worked in group using ALLR Students Workbook and presented the result in class discussion. Presentation evaluation instrument is used to evaluate students' science process skills during

discussion session. This instrument not only assesses students' communication capability, but also assesses the material that they present during class discussion session. The data analyzed descriptively to explain students' achievement in group. The data will describe about students' achievement (science process skills and tolerance and social justice values) written on Paper Presentation and the writing technique.

**Results and Discussion**

Students worked in groups during learning process. The lecturer always reminds students to work together and emphasizes the importance of working together. The lecturer also reminds students that this collaboration is a feature of the Indonesian nation as contained in the third principle of the Pancasila. Emphasis on tolerance is done at the beginning of the discussion. At the first meeting, students worked on assignments related to the topic of capillarity. Students solve problems in the ALLR Student Worksheet on the topic of capillarity and the greenhouse effect.

The Students Workbook led students to determine problems showed in natural phenomena that appear in their daily live. The lecturer acts as a facilitator who helped students to complete assignments while integrated character education during learning process. Students were reminded to work together in groups and prioritize kinship and tolerance during the discussion through the "Character Building" feature in the Student Workbook. The Student Workbook used is a Student Workbook developed to fit the ALLR learning model. This Student Workbook are expected to integrate character education, especially in strengthening tolerance and social justice values during the learning process (Sari, 2018 ).

After the learning process, students showed a good pattern of cooperation. Based on the observations, students gave each other opinions to complete tasks in the Student Workbook. The results of group discussions are contained in a paper that will be used as a medium to present the results of group work (Presentation Paper). Students discuss the topic of capillarity in the 1st meeting and about the topic of the greenhouse effects at the 2nd meeting. Figure 1 and Figure 2 each show examples of student work outcomes in meeting 1 and meeting 2.

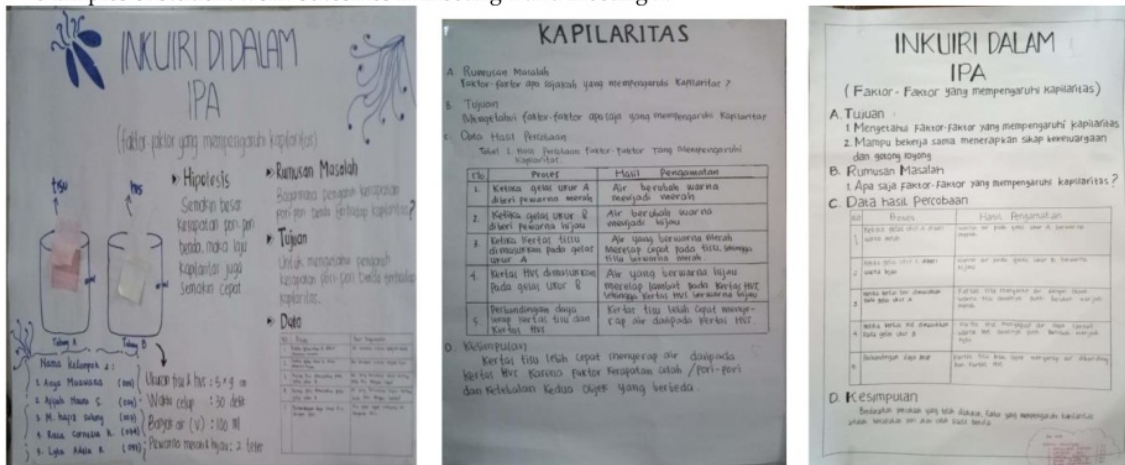


Figure 1 Students' Presentation Papers in the 1st meeting

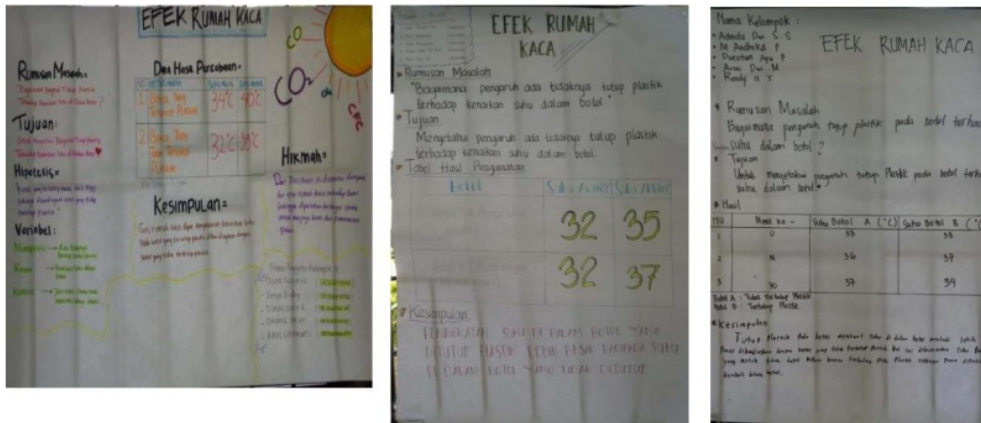


Figure 2 Students' Presentation Papers in the 2<sup>nd</sup> meeting

The evaluation of the presentations was not only limited to presentation techniques, but also to the content of the presentations delivered, especially related to student science process skills. The lecturer gave feedback during class discussions to provide input for each group.

At the 1<sup>st</sup> meeting, it showed that three out of four groups still could not distinguish between the problem formulation and the research question. Although they formulate problem statement in the form of question sentences, the problem statement does not have relationship between two or more variables. During class discussions, the lecturer gave feedback to the students, discussed and reminded them about making the correct problem statement. The lecture also gave feedback about the differences between problem statement and the research questions. Although students cannot change the formulation of the problem in the presentation paper, the lecturer provides an opportunity for students to write the correct problem statement in the Student Workbook they have.

Increasing the ability to formulate problems has been seen in the 2<sup>nd</sup> meeting which discussed the greenhouse effects. Students have formulated a problem statement in the form of a question sentence that connects two variables. Students also understand the differences between problem statement and research questions.

Meanwhile, the hypothesis that was made has shown that students try to answer the problem. The hypothesis is made by students based on their knowledge. The lecturer reminded that students should make hypothesis based on theories from relevant sources. At the 1<sup>st</sup> meeting students still have to change the hypothesis to fit the problem statement that has been fixed. In the 2<sup>nd</sup> meeting, the student's hypothesis is in accordance with the problem statement and based on theories from relevant references. In this 2<sup>nd</sup> meeting students seemed to bring relevant books and references related to the topic of the greenhouse effect.

Another thing displayed in the student presentation paper is the data. Since the 1<sup>st</sup> meeting, the data displayed by students has been written well so it is communicative. The table title and table contents are appropriate. In addition, students have made conclusions that can answer the presentation results. However, students have not written and revealed how to analyze orally or written during class discussions both at the 1<sup>st</sup> meeting and at the 2<sup>nd</sup> meeting. At the 2<sup>nd</sup> meeting, the lecturer warned that students should give a brief and clear explanation before stating the conclusions from the activities obtained. This is important to provide an overview of the analysis process before drawing conclusions from the activities carried out.

When the lecturer provides feedback and gives question to explore how students analyze, it appears that students have analyzed the data in a good way. All students stated that they discussed the data analysis in group discussion activities. However, this analysis is not written and presented in class discussion sessions because they place more emphasis on the conclusions produced. The lecturer

warned that data analysis is important in proving the hypothesis. Researchers must be able to explain the analysis carried out before stating a conclusion so that conclusions can be accepted with logical reasons.

Conclusions made by students have proven the hypothesis they stated. Students did not experience significant difficulties in making conclusions. Even though at the 1<sup>st</sup> meeting they had to change conclusions which could answer problem statement and the hypothesis made.

At the end of the lesson, the lecturer invites students to take lessons from the activities carried out. The ALLR learning model allows students to take lessons from material content learned by students (Sari, 20018). In the 1<sup>st</sup> meeting, students seemed confuse to take lessons. With the guidance of the lecturer, students understand the meaning of the lesson better. At the 2<sup>nd</sup> meeting, students have shown wisdom taking activities. However, only one group wrote the lessons learned in the Presentation Paper. Other groups take lessons after the lecturer leads them to think together with the group in wisdom taking activities.

Technically, in the 1<sup>st</sup> meeting three groups of four wrote with a very small size font that the audience could not read. The lecturer provides feedback to students to determine the things that need to be written on the Presentation Paper and things that need to be submitted orally. This determination must certainly be agreed in groups by considering the effectiveness and efficiency of presentation during class discussions. Students have made improvements in writing on Presentation Paper technically. For example, at the 1<sup>st</sup> meeting, table is written too small so that it could not be read by other students and lecturers who saw student presentations. There is only one group that wrote data with a size that can still be seen by audiences. At 2<sup>nd</sup> meeting, students have written data that is presented in the appropriate size. Not only data, but the problem statement, the hypothesis, and conclusions have been written in a size that can be read by the audience.

Based on the results of the activities conducted at both meetings, <sup>8</sup> it can be seen that the application of the ALLR learning model facilitated by the Student Workbook has helped students master science process skills better. This was shown in the presentation made. Students showed progress in formulating problems, making hypotheses, determining work steps, analyzing, and drawing conclusions. However, some students need to be reminded the difference between problem statements and research questions. These results also show group achievements because paper presentation is not prepared individually. Thus, individual achievements cannot measure yet during this study.

The writing technique in Paper Presentation has also increased. Students have been able to choose important things that must be presented in the Presentation Paper and determine the parts that are presented orally without the need to be written in Presentation Paper. Some groups are still writing with a complete text that has not been read clearly by the audiences who were far from the place where the Presentation Paper was posted. It shows that explaining the criteria of a good paper presentation is important although this task is not a new task for students.

During the learning process, students also felt the importance of cooperation by promoting tolerance and social justice in solving problems. Lecturers always remind students to discuss in a good way. Some students admitted in the eleventh discussion that they often faced dissent. Some of them disputed their friends in an emotional manner during group discussions, but this was understood by his group friends. Their relationship remained well after the discussion. They stated that they reminded each other to continue to work well together and establish good relations even though there were differences during the assignment.

## Conclusions

The conclusion is the ALLR learning model which is facilitated by the Student Workbook can be applied for improving science process skills while strengthening students' character. However, during the discussion it is important to give some clues for students in order to do the task correctly, such as give a right example of problem statement. The writing technique in paper presentation is also an important factor to be observed. Some students still do not realize that not all of the discussion

results must be written on paper presentation. Thus, it is important to give criteria for good paper presentation in Student Workbook so students can be carefully to decide what they should write on the paper and what not. Meanwhile, this learning model gives a chance to learn more about diversity, social justice and tolerance values during groups and class discussions. Students show the positive attitude, such as promoting tolerance and social justice during discussion session. Students can work well together and establish good relation while solve the problem. The differences that always come up during the discussion give opportunities for students to appreciate each other opinion and to know each member better.

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