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Implementation of character-based practicum performance assessment and its effects on students' self-concept in environmental pollution course

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Abstract
Practicum performance assessment is defined as a tool for students' performance during practicum that assesses thinking skills, laboratory skills, social skills and process skills which are believed to influence their academic self-concept in Environmental Pollution course. This research aimed to explore the implementation of character-based practicum performance assessment and its effect on students' self-concept in Environmental Pollution course. The sample size for this study was 65 students who enrolled in the course at the Tadulako University in Palu, Central Sulawesi, and Sintuwu Maroso University in Poso, Central Sulawesi. Data of character-based practicum performance assessment were obtained from observations, while data for the students' self-concept data were from questionnaires, and analyzed descriptively and statistically with linear regression analysis. The results showed that the value of character-based practicum performance was 81 under very good category and the value of self-concept was 79 under high category. The correlation value between character-based performance assessment and self-concept was 0.529 under moderate correlation category, and the calculated F value was 24.524, greater than the F-value or the critical F (4.00) with the significance value of 0.000. From those data, it can be concluded that the implementation of character-based practicum performance assessment has a correlation with students' self-concept in Environmental Pollution course.

Keywords: character-based practicum performance assessment, self-concept, students, practicum, environmental pollution

1. Introduction
Practicum is a structured and scheduled learning activities consisting of stages, which are preparation stage of preparing tools and equipment to be used and listening to explanations regarding instructions or work steps, implementation stage where students use laboratory equipment and do the practicum as instructed, and follow-up stage where students are asked to review their practicum results and discuss difficulties happened during the practicum (Ulfa, 2016) [13].

Practicum can improve students' understanding of a concept, because through practicum the students experience or be responsible in their own learning processes such as observing, analyzing, proving and drawing conclusions about a certain object. Successful of a practicum is highly influenced by students' performance. The better their performance are, the better the expected learning outcomes which can achieve the practicum target.

Practicum performance assessment is defined as a tool for students' performance during practicum that assesses their thinking skills, laboratory skills, social skills and process skills during practicum in a laboratory. The tool developed and used in this research was character-based practicum performance assessment, under the assumption that students with character-based performance will be able to demonstrate the expected skills, not merely choosing one answer out of the given possible answers, resulting positive influence on their self-concept academically. This means that a well-developed character-based practicum performance will make students accept the truth based on the experiment results, able to develop exploration nature on science and technology, thereby fostering a high sense of confidence, especially in Environmental Pollution course.

Environmental Pollution course is a course that provides knowledge about types of pollution, effects of pollution, and how to deal with effects of environmental pollution. Ideally this course is targeted to make sure that students, after taking this course, can respond to various environmental pollution problems and how to overcome them. It is also expected that through this course and suitable learning model, students can improve their academic abilities. In reality, learning models that do not actively involve students can still be found in classroom activities, which has negative impact on their academic self-concept. Students who are less involved in the learning process will have less confidence and influence their academic achievement negatively. On the other hand, high self-concept will enable students to complete all tasks given and able to solve problems encountered during learning process. Thus it can be said that self-concept can influence thinking skills in a higher level and vice versa.

Hurlock (1979) [5] defines self-concept as composition of images of self-perception, where perception itself is beliefs, feelings, and attitudes about values recognized by individuals as their nature. In addition to that, Hurlock also explains that the composition of self-concept is formed by a variety of gradual experiences, with childhood experiences as its basic composition element. In line with this, Patterson (1992) describes that self-concept is a self-structure, which is a perception of the connection between

"I am the subject" and "I am the object". In other words, there is a strong unity organized or formed by various aspects of life experiences together with the values associated with its development stages (Hurlock, 1979; Patterson, 1992) [5, 8].

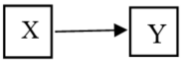
Alrajhi and Aldhafri (2015) [1] describe self-concept as beliefs and evaluations made by individuals about themselves. These beliefs and evaluations show what they think about themselves and what they can achieve in the future. Self-concept can predict individuals' academic achievement significantly. Wilson and Wilson (1996) [14] add that self-concept has a dynamic nature, always open to changes. Facts show that many students did not have good or positive self-concept about themselves, both in classroom activities and in laboratory practicum activities. They were less competent and did not have sufficient self-confidence to develop their academic potential, let alone evaluate their abilities.

The research results conducted by Tanujaya *et al*, (2017) [12] found that there is a correlation between academic ability and academic performance, while Berg and Smith's research (2018) [2] also found out that there is a relationship between practicum and increased self-efficacy. Supporting those results, Felton and Harrison (2017) [4] state that practicum is an important learning environment to facilitate the development of skills, knowledge, behavior, and attitudes that affect students' thinking abilities.

This research aimed to explore the implementation of character-based practicum performance assessment and its effectiveness on students' self-concept in Environmental Pollution course.

2. Research Methods

The design used in this research was a correlational study, aimed to describe the implementation of character-based practicum performance assessments and its effectiveness on students' self-concept in Enviromental Pollution course. The design is described as follows:



Where X symbolizes character-based practicum performance and Y symbolizes self-concept.

The sample size for this study was 65 students of Biology Education Study Program in Tadulako University in Palu, Central Sulawesi, and in Sintuwu Maroso University in Poso, Central Sulawesi, enrolled in Environmental Pollution course. Data of character-based practicum performance assessment were obtained from observations during practicum activities and data for the students' self-concept data were from questionnaires, all with the range of score 0-100. After obtaining the data, the data were analyzed descriptively and statistically using linear regression analysis.

Alternative hypothesis to test in this research is that the implementation of character-based practicum performance assessment has a correlation with students' self-concept in Environmental Pollution course. The hypothesis is accepted if the significant value is less than 0.05 and the F-counted is greater than F-value or critical F. Criteria for correlation coefficient used in this research are presented in Table 1:

Table 1: Criteria for Correlation Coefficient

Correlation Interval (r)	Correlation Category
0,00 - 0,199	Very Low
0,20 - 0,399	Low
0,40 – 0,599	Moderate
0,60 – 0,799	Strong
0,80 – 1,00	Very Strong

Source: Sugiyono, 2017 [10]

3. Results

Table 2 presents the results of analysis on practicum performance in Environmental Pollution course.

Table 2: Character-based Practicum Performance in Environmental Pollution Course

No.	University	Score of Practicum / Skills Performance			
		Thinking Skills	Laboratory Skills	Social Skills	Process Skills
1.	Tadulako University, Palu	85	83	84	73
2.	Sintuwu Maroso University, Poso	82	81	87	72
Average		83.5	82	85.5	72.5
Category		Good	Very Good	Very Good	Good

Table 2 shows that character-based practicum performance obtained a range of score 72 – 87 under category of good and very good. Figure 1 shows the recapitulation of practicum results based on the characteristics of each opinion.

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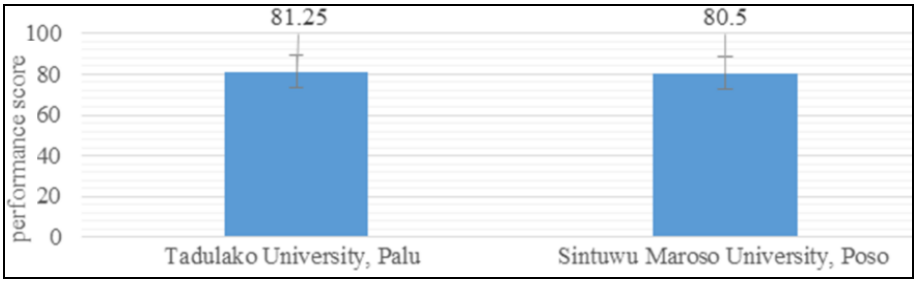

Fig 1: Character-based Practicum Performance in Environmental Pollution Course

Figure 1 shows that the character-based practicum performance in Environmental Pollution course was under very good category with an average value of 81. Next, Table 3 displays the results of analysis on students' self-concept.

Table 3: Students' Self Concept in Environmental Pollution Course

No.	University	Score of Self Concept	Category
1.	Tadulako University, Palu	78	High
2.	Sintuwu Maroso University, Poso	80	High
Average		79	High

Based on the displayed information, students' self-concept in Environmental Pollution course fell under high category. Furthermore, the output results of linear regression test for character-based practicum performance on self-concept is seen on Table 4.

Table 4: Analysis Output of Linear Regression for Character-based Practicum Performance (X) on Self Concept (Y)

No.	Test Variable	Value
1.	R	0.529
2.	R Square	0.280
3.	F-counted	24.524
4.	Sig.	0.000
6.	t-counted	3.079
7.	Constant a	31.05
8.	Constant bX	0.627

Table 4 shows that r correlation value was 0,529 under moderate category, as in the ANOVA results. Since the ANOVA test results the F-counted was 24.524 or greater than critical F or F value with 2.37, the sig. value obtained was 0,000, therefore the alternative hypothesis was accepted, that there was a significant correlation between variable X and variable Y. later, the results of coefficient regression showed that the constant a value was 31.05, constant b X value was 0.627, so the linear regression line showed an equation of the form Y= 31.05+ 0,627X, as can be seen in Figure 2.

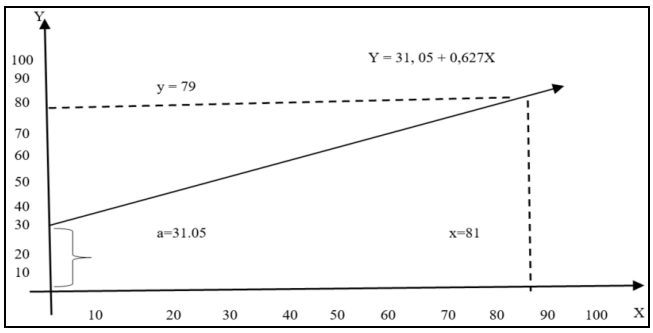

Fig 2: Linear Regression Line for Character-based Practicum Performance (X) with Self Concept (Y)

As seen in Figure 2, the equation line for the form Y = 31,05 + 0,627X, that if the value of character-based practicum performance (X) was 0, then the value of self-concept (Y) was 31,05, and if there is a change of performance value by 1 (X) it can also change the self-concept value by 0,627.

4. Discussion

Based on the data displayed in the previous section, the implementation of character-based practicum performance assessment has shown very good results. This can be seen from the score percentage of practicum performance consisting of thinking skills, laboratory skills, social skills and process skills that obtained very good results (72.5 - 85.5).

Students looked very enthusiastic and highly motivated during practicum activities, because the activities facilitated their experiences to directly see the impact of pollution on living things, thus providing real learning experiences for them that improved their performance and learning outcomes. According to Mustami and Gufran (2015)[6], comparing outcomes with a set performance criteria as written in standards of competencies is one effort that can be used to make sure whether the students have well performance or not.

The observation results on thinking skills obtained 83.5 under very good category, meaning that the students have been able to interpret concept and overcome difficulties during practicum through characters of innovative, a great curiosity, responsible and thorough. This is consistent with Soemanto's explanation (2006)[11] that demonstrating thinking skills is a dynamic process that undergoes three thinking steps; understanding formation, opinion formation and decision making.

The observation results on laboratory skills obtained 82 under very good category, meaning that the students already showed characters of discipline, innovation, integrity and agility. Laboratory skills are skills in using laboratory tools and equipment that support the successful of practicum activities. The activities are from preparing tools and materials to using the tools and equipment properly to achieve the expected learning interaction, which is effective learning process and outcomes. This is also in line with Sardiman's statement (2012) [9] that the media or learning tools are used to achieve learning objectives and are able to improve learning outcomes.

The observation results on social skills got high score of 85.5, meaning that the students were able to perform well socially during the practicum: showing high self-confidence, helping friends to overcome difficulties and being able to cooperate with other group members. Unified teamwork cooperation will provide maximum learning outcomes, as seen during observation on students' social skills in practicum activities. Social skills are the ability to communicate and cooperate with others with mutual cooperation, self-confidence and a great work ethic. Napis and Rahmatulloh's research results (2019)[7] showe that students with social skills attempt to activate their cognitive process to search, process and find answers based on the concepts that will have an impact on their learning outcomes.

The observation results on character-based practicum performance showed that there was a practicum performance that has not achieved maximum score: process skills with 72.5 such as skill in formulating problems and making hypothesis. Several students were still not able to connect the experiment purpose with problems to formulate. However, this can be understood since the students were not familiar with this kind of assessment method, because the previous method used to assess their practicum performance did not require them to formulate problems and make hypotheses.

The correlation analysis results of thinking skills, laboratory

skills, social skills and process skills on self-concept obtained a correlation value of 0.594 under moderate category, meanwhile the correlation value obtained was 0.28. This means that thinking skills, laboratory skills, social skills and process skills had a positive correlation with students' self-concept by 28% and the rest was influenced by other factors. Thus, it can be interpreted that the greater the value of character-based practicum performance is, the greater the value of students' self-concept.

The correlation value obtained between character-based practicum performances with self-concept was due to the strong willingness of students in completing the given task, trying to use their mind in maximum to think deeply through discussing questions related to environmental pollution practicum material and interpreting concepts correctly. This is in line with the explanation by Erkman *et al*, (2010) [3] that positive self-concepts can emerge if provided with a positive learning experience too, one of which is through assessing skills in practicum activities.

Based on the analysis on the students' answers in self-concept questionnaire, it was found out that students already had high self-concept, meaning that they were already confident in their own abilities without others' help. The students' strong self-concept was obtained long ago and can be increased if given a right stimulant such as character-based practicum performance assessment. This is in line with the statement of Alrajhi and Aldhafri (2015) [1] that self-concepts are built since childhood and parents have a very important contribution to the development of positive or negative self-concepts.

5. Conclusion

Based on the research results and discussion, it is concluded that there is a correlation between the implementation of character-based practicum performance assessment and self-concept with F-counted of 24,524 or greater than F-value (critical F with 4.00) and sig. value of 0,000.

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