



Living Values and Creative Thinking Skills in The Physics Learning Process: How They Correlate?

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Abstract

People must be aware of the benefits and drawbacks of technology in the era of the Fourth Industrial Revolution. To survive the industrial revolution, one must have strong moral principles and be able to think creatively. 4.0. Living values are moral principles that a person possesses. The capacity to think creatively and solve issues effectively goes hand in hand. This follow-up study demonstrates how learning physics contextually based on local potential might enhance critical thinking abilities and ethical principles. The purpose of this study is to ascertain whether there is a connection between creative thinking abilities and living values. The research uses a one-shot case study design in a quasi-experiment method. Students in Wonosobo Regency's class IX high schools who had adopted a contextual physics learning model based on local potential made up the research participants. The research tools include tests of creative thinking abilities and observation sheets to gauge living values. Ten items are described as part of the test. Each instrument has undergone testing to ensure that it satisfies fair and trustworthy criteria. A correlation test is the method used for data analysis. With a significance of 0.295 (bigger than 0.05), the study's findings indicate no connection between having moral principles and having creative thinking abilities.

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1. Introduction

Industrial Revolution had many positive impacts. The general public has experienced this a lot. Nonetheless, RI 4.0 also had adverse effects, such as plagiarism behavior among students [1]–[3], rampant hoax news [4], low character scores among students [5], [6]. Even information related to negative behavior becomes a hot issue in various electronic and non-electronic media almost every day. This phenomenon shows low living values. The application of living values contributes 26% to forming students' character [7].

The Industrial Revolution 4.0 also requires various skills to deal with it, one of which is creative thinking skills. Creative thinking skills are a person's ability to solve problems in numerous fields, creating innovative, original, and quality solutions [8]–[10]. Through creative thinking skills, people are required to have skills in solving problems and creating innovations in the form of ideas or works that can be used to improve people's quality of life.

In the study of physics, the emphasis is placed on both the process and the results of learning. Due to the requirements of the relevant curriculum, process physics achievements in senior high school (SMA) focus not only cognitive factors but also affective and psychomotor aspects. Kurikulum Merdeka Belajar, which is currently beginning to be implemented at the high school level in the form of the Pancasila Student Strengthening Profile Project, emphasizes the loading of affective factors in learning once more.

The goal of contextual physics learning based on local potential is to meet the expectations of physics learning outputs from SMA and RI 4.0 research that has been conducted in the past. Therefore, mastering contextual physics based on local potential can enhance one's capacity for original thought and moral character [11].

The achievement of creative thinking skills and living values as a result of contextual physics learning based on local potential contains the next question, whether there is a relationship between creative thinking skills and living values. It is because, based on the distribution of research data, most students who score high on living values also have high scores on creative thinking skills. In addition, based on the results of observations, it is explained that students with high living values tend to be able to support the formation of a lively and directed learning climate. Conversely, students with low living values need help directing learning activities. Students with common living values are less severe in carrying out learning. Some of them played and joked more, resulting in a low score of creative thinking skills.

The study shows a connection between character and creative thinking skills [12], effective learning [13], and students' mathematics learning achievement in the moderate category [14]. [15] also succeeded in proving that there is a relationship and influence of the character of cooperation with student responses. The results of this study show that character education is essential in maximizing learning outcomes. That is, having student character will help students better achieve good learning outcomes. It is confirmed by the research [16] that schools with higher total character education implementation tended to have higher academic scores on academic measures for the year before their application, the year of their application and the following two years.

This study aims to ascertain whether there is a relationship between critical thinking skills and living values, as well as how much living values influence the development of creative thinking skills, based on previous research and various research on the relationship between character and learning outcomes. To improve the pace and caliber of physics learning, it is crucial to learn more about the relationship between learning achievement variables.

2. Methods

The research method is a quasi-experiment. The design research is One Shot Case Study. The research variables are living values and creative thinking skills. The research respondents were class XI students of SMA N 1 Mojotengah (23 students) and SMA N I Kaliwiro (22 students) who studied physics using a contextual approach based on local potential. In order to simplify and shorten the SMA N 1 Mojotengah was replaced with the SMA A and SMA N 1 Kaliwiro with SMA B. The research instruments were observation sheets and test sheets. Observation sheets measure students' living values and tests to measure creative thinking skills. The living values referred to in this study include

honesty, responsibility, and synergistic work, all of which have met the validity test [17], [18]. The creative thinking skills test has also fulfilled the validity and reliability tests [19]. Data analysis was a correlation test to determine whether there was a relationship between living values and the creative thinking skills of students implementing contextual physics learning based on local potential using the SPSS version 25 application.

3. Results and Discussion

In the framework of the learning of physics, which is based on a contextual approach and leverages local potential as a learning basis, this study seeks to ascertain whether there is a correlation between living values and creative thinking abilities. There are eight learning steps, which are as follows: (1) investigating real-world issues, (2) using experimental techniques, (3) formulating hypotheses, (4) conducting experiments, (5) analyzing experimental data, (6) communicating findings, and (7) (reflection). The physics learning step has effectively improved creative thinking skills and living values [11]. The purpose of this study is to determine whether the ability to think creatively and living values are related. The research findings on living values and creative thinking skills are summarized Table 1.

Table 1. Summary of Data on Creative Thinking Skills and Living Values

Creative thinking skills		Statistic	Living Values		Statistic
SMA A	Mean	19.8761	SMA A	Mean	31.5309
	Median	19.7500		Median	31.3800
	Variance	1.590		Variance	1.093
	Std. Deviation	1.26089		Std. Deviation	1.04545
	Minimum	17.00		Minimum	29.38
	Maximum	21.50		Maximum	33.25
SMA B	Mean	60.3541	SMA B	Mean	29.6982
	Median	60.0000		Median	30.3150
	Variance	44.721		Variance	5.900
	Std. Deviation	6.68735		Std. Deviation	2.42898
	Minimum	45.56		Minimum	24.13
	Maximum	73.33		Maximum	32.50

The average level of creative thinking among SMA A students is lower than that of SMA B, as seen in Table 1. With the average living values score, things are different. Despite being hardly noticeable, SMA A students' living-values score is greater than SMA B students'. For information's sake, Wonosobo Regency has two public high schools, SMA A and SMA B, that are both equivalent to middle schools. The accrediting level and the academic contribution of pupils when they attend high school serve as the basis for defining the level.

But there are clear distinctions between the two. The school's location is where the first difference can be observed. While SMA B is in the hamlet, SMA A is in the district town. The existence of SMA A predates that of SMA B. Additionally, although SMA B students come from lower middle-class families, the majority of SMA A students come from families with middle- to upper-class socioeconomic backgrounds.

Table 2. Results of The Normality Test For Data on Creative Thinking Skills and Living Values

Variable	Class	Kolmogorov-Smirnov		
		Statistic	df	Sig.
Creative thinking skills	SMA A	0.130	23	0.200*
	SMA B	0.137	22	0.200*
Living values	SMA A	0.120	23	0.200*
	SMA B	0.161	22	0.141

Data on creative problem-solving abilities and moral character are presented in Table 1 with an outline and differentiation for each SMA. The inverse link between creative thinking abilities and guiding principles is seen in Table 1. However, this is merely a basic study that gathers data from several school groups. Next, pupils from the two high schools pooled their critical thinking abilities and core values. Then, conduct a pre-test and test the hypothesis to determine whether there is a relationship between creative thinking abilities and moral principles.

Correlation test analysis requires prerequisite tests, namely the normality and homogeneity tests. The normality test results using the Kolmogorov-Smirnov statistical test are in Table 2, that shows that the data distribution on creative thinking skills in SMA A and SMA B has a significance value of more than 0.05. It shows that the creative thinking skills data on SMA A and B come from normally distributed populations. The same thing is also found in the data living values. Table 2 shows that the living values data for SMA A and SMA B students have a significance of more than 0.05, namely 0.200 and 0.114. It means that the living values data for each SMA also comes from a normally distributed population.

Based on Table 3, the distribution of data on the creative thinking skills of SMA A and SMA B students has a significance of less than 0.05. The data on creative thinking skills in SMA A and SMA B does not meet the homogeneity test. The same is true of the living values data with a significance value of 0.00 (less than 0.05). That is, living values data do not come from a homogeneous population.

According to the findings of the prerequisite test, the data used to determine the normality of creative thinking abilities and living values came from populations with normal demographics. The homogeneity test, however, revealed that the information regarding values and creative thinking abilities did not agree. Therefore, a nonparametric statistical test is used for the correlation test. The Rank Spearman correlation test is used for the correlation test, depending on the goal and qualities of the data (Table 4).

Table 3. Results of The Data Homogeneity Test for Creative Thinking Skills and Living Values

		Levene Statistic	df1	df2	Sig.
Creative thinking skills	Based on Mean	18.714	1	43	0.000
	Based on Median	17.428	1	43	0.000
	Based on Median and with adjusted df	17.428	1	22.376	0.000
	Based on trimmed mean	18.978	1	43	0.000
Living Values	Based on Mean	15.241	1	43	0.000
	Based on Median	9.728	1	43	0.003
	Based on Median and with adjusted df	9.728	1	29.153	0.004
	Based on trimmed mean	13.682	1	43	0.001

Table 4. Spearman Rank Correlation Test Results

			Creative thinking skills	Living_Values
Spearman's rho	Creative thinking skills	Correlation Coefficient	1.000	-0.160
		Sig. (2-tailed)	.	0.295
		N	45	45
	Living values	Correlation Coefficient	-0.160	1.000
		Sig. (2-tailed)	0.295	.
		N	45	45

The hypothesis test resulted in a significance value of 0.295, which is greater than 0.05. It indicates that there is no connection between moral principles and original thought. Therefore, there is no connection between students' ability to achieve living values and their capacity for creative thought when they engage in contextual physics learning that is based on local potential. However, as the correlation test employed nonparametric statistics, the findings of this study only applied to SMA A and SMA B. As a result, only research volunteers are affected by the findings.

Contextual physics learning based on local potential is a learning model based on a constructivist approach with local potential as a basis for improving creative thinking skills and living values [11]. The results of the study show that there is no relationship between creative thinking skills and living values. The research results only apply to SMA A and SMA B. The research results differ from those of [12] in that there is a relationship between character and creative thinking skills. [13] shows a relationship between characters and effective learning. Research [14] also stated that there is a correlation between character education values and students' mathematics learning achievement in the medium category. The incompatibility of the research with several other studies is the material for a more detailed discussion regarding the research process from start to finish.

The study shows no relationship between creative thinking skills and living values, possibly due to several factors. The first factor is creative thinking skills as part of a cognitive assessment that forms more quickly than living values. The study period is only 2 (two) months. Creative thinking skills enable problem-solving in various fields, creating innovative, original, and quality solutions [9], [10]. [8, p. 1629] added that creative thinking can be developed through creativity and innovative problem-solving techniques.

Living values are fundamental values that are easily internalized and implemented in life. Living values are developed from the nation's noble values. Living values that are embedded in the long term will shape character. Kirschenbaum (1995) in [20] stated that instilling living values requires a comprehensive approach, including inculcation, good facilitation, and skills development. Inculcation instills values through strategies using fiction and non-fiction, gifts and appreciation, symbols-slogans-posters, teaching empathy, extracurricular activities, and developing self-esteem (awareness of self-worth). Exemplary is done by showing students the best way to solve problems. Facilitation trains students to overcome difficulties through various learning strategies, including: setting priorities, interviews, value-laden poetry, discussion of moral dilemmas, self-evaluation, and debates on controversial issues. The technique developed to grow values to life through skills includes critical thinking, creative thinking, communicating clearly, listening, acting assertively, and finding conflict resolution, which is briefly called academic skills and social skills.

Meanwhile, [21] states that living values can be grown through habituation and continuous training for a long time at home, school, and in the community environment. Living values take a long time to grow and develop in students. Among the several ways to cultivate living values, 2 (two) ways are most widely practiced and show promising results, namely exemplary and habituation [22]–[26]. [21] added that students' cognitive abilities might increase during cultivating living values. [27] have proven that there is a correlation between creative character and cooperation with critical thinking. However, [21] does not guarantee that living values will be formed before cognitive abilities. It can appear in reverse. Cognitive abilities appear first, followed by the formation of living values or vice versa. It depends on the characteristics and skills of students in learning.

The second factor is living values education which is less effective if carried out at a higher level of education than elementary school. Growing living values must be done early on because it is a golden age that determines the quality of children in adulthood [22]. Students in high school are in a zone where they obey certain (internal) standards but don't obey other people's (external) standards. Morality is internalized and not based on other people's standards. One recognizes alternative moral courses, explores options, and then decides based on a personal moral code [28, p.354]. It shows that students at the high school level prioritize logic in acting. In addition, children's morality is no longer formed but internalized from what has been formed from the origins of students, namely the family. Thus, there needs to be more effort to cultivate living values through example and habituation [22]–[26].

The third factor is increasing living values through learning physics at school which is less than optimal and not comparable to growing living values in the family. The family is the main gate for starting character education for children. Family failure in shaping children's character will result in the growth of a characterless society [29]. The character shown by parents will influence the development of children's character; what is heard, seen, and felt by children becomes lessons that will be followed [22], [30].

Apart from various analyses related to several factors that may cause the research results, several things need to be considered and can be followed up through further research. The first thing is that the living values in this study include honesty, responsibility, and synergistic work. The study shows no relationship between creative thinking skills and living values. What if the research results are seen from the components of each living value? This analysis will further prove what parts of living values play a role in determining creative thinking skills and vice versa. It is based on the theory presented by Kirschenbaum (1995) in [20] that one of the four ways to instill living values is through skills, one of which is creative thinking. The second thing is to do research by adding more respondents from several high schools to make the research results more representative, representing all high schools in Wonosobo Regency.

4. Conclusion

The study shows no correlation between creative thinking skills and living values from contextual physics learning processes based on local potential. The study is not for generalization. It only applies to students who are the subject of research.

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