Implementing Inquiry Based Ethno-Constructivism learning module to Improve Students' Critical Thinking Skills and Attitudes Towards Cultural Values*

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A R T I C L E I N F O	A B S T R A C T

Purpose: Critical thinking and student attitudes are pertinent to 21st century learning of cultural values which is still very low. Research with a focus on improving these skills and attitudes using inquiry-based approaches are very limited. This research aimed to improve critical thinking and student attitudes of elementary school teacher education students with an inquiry-based learning model assisted by the ethno-constructivism module against the traditional printed teaching materials used in lectures. **Methodology:** This study used experimental quantitative design where the sample was selected using the purposive sampling technique. The sample of 68 participants was equally divided into one experimental group (n = 34), who was taught by the inquiry-based learning model and one control group (n = 34), taught using traditional teaching materials. Oliver-Hoyo Rubric for Critical Thinking (OHRCT) and one attitude questionnaire were used as research instrument. Data was analyzed using SPSS 21 application to achieve descriptive statistics in the form of mean, min, max, and categories and inferential statistics for independent sample t-test (t-test).

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Findings: A significant difference in terms of critical thinking skills and students' attitude was found between the control and the experimental groups. The experimental group treated through the inquiry-based ethno-constructivism module was found having superior critical thinking skills and attitudes towards learning cultural values as compared to the students of control group. **Implications for Research and Practice:** The implementation of inquiry-based learning model assisted by the ethno-constructivism module is proven as an effective method to encourage critical thinking and developing positive attitude among elementary school teacher education students. Pre-service teachers need to be given the opportunity to develop direct experiences and thoughts about cultural values and devise activities to teach these values. The teachers must also introduce the inquiry-based learning in developing their teaching tools.

Introduction

The development of science and technology has led to a process of change in all aspects of life, including the world of education. The need for services and opportunities for improving learning for students is the driver of the emergence of education reform. Therefore, education reform must always be carried out by pursuing a learning process that is in line with the times by utilizing Information and Communication Technology (ICT). The use of information and communication technology in learning can support and develop students' cognitive, affective and social skills, or even higher skills (Hidayat et al., 2017). The use of information technology in the learning process has become a necessity as well as a demand. The Law of the Republic of Indonesia Number 20 of 2003 concerning the national education system states that the learning process is a process of interaction between students and educators and learning resources in the learning environment. Kyriakides et al. (2008) and Aktekin (2019) assert that the teaching and learning process is a three-way relationship between the lecturer, the material he uses and students. So, learning resources are one of the factors that make students understand concepts and materials well. In addition, the quality of student interaction with learning resources has a profound effect on learning outcomes (Butcher et al., 2019).

The curriculum in Indonesia today requires elementary school lecturers and prospective lecturers to instill the cultural values of a society in their learning. There is a need to build a creative, innovative, and effective young generations by integrating attitudes, abilities, and knowledge with life skills (Andrini, 2016; Kabeel et al., 2016; Siburian et al., 2019; Taghva et al., 2014). Therefore, educational institutions in the country need to establish acquiring competencies as the goals of curriculum (Pantić et al., 2012; Sahika, 2018). In addition, lecturer education practitioners agree that lecturer education should aim to educate high-quality elementary school lecturers who can be successfully integrated into the education system (Boonjeam et al., 2017; Dobber et al., 2013; Ezer et al., 2010). These elementary school lecturers are expected to get trained in global competencies, knowledge base, skills, and attitudes so that they could effectively carry out their professional duties and function in schools profitably, despite the changing and interdependent societies (Sinagatullin, 2019).

In accordance with the competence required, current lecturers must have the skills of perception, interpretation, and decision making (König et al., 2016). Because the lecturer is an important instrument in realizing good learning, which can be supported only by the lecturers' competencies. Competence is the ability to perform tasks in certain situations, such as class situations, in a flexible and adaptive way (Kaendler et al., 2015). Lecturer competencies that must be mastered are pedagogical, professional, personality-based and social competence related. According to Law No. 14 of 2005 article 10 "lecturer competencies that are mandatory for lecturers include pedagogical competencies, personality competencies, social competencies and professional competencies obtained through professional education". Lecturers who have good competence will produce students who are successful in learning.

One of the objectives of applying technology in education is to improve the quality and quantity of education and lecturers in Indonesia. Fu (2013) asserts that technology makes knowledge acquisition more accessible and, particularly in the field of learning, by involving students in the application of technology. There are many things that lectures can do by using Tats in the learning process. Lecturers can find more educational references; they can use technology as a learning medium. Bansal (2016) believes that technology as a good teaching medium provides confidence and motivation to enhances learning. Therefore, a lecturer must be able to teach students to use technology without leaving the cultural values and attitudes of a student. Technology-based education or E-learning is one of the things that can be utilized by lecturers in the learning process and contribute to building their critical thinking skills and attitude towards cultural values, the variables of this study. E-learning plays a great role in motivating students to improve their critical thinking skills and attitudes towards cultural values. Lister (2014) asserts that, e-learning and online courses refer to courses that are delivered partially or entirely online, synchronously or asynchronously. Kaewkiriya (2013) asserts e-learning ensures that learning resource content should be enjoyed and delivered effectively or, if possible, by making it accessible to students from their home or school. In addition, e-learning makes it easier for lecturers to deliver the subject matter. One of the popular forms of e-learning based learning is to use the inquiry-based Flip 3D book application. There are such psychological aspects in the inquiry-based application that proves advantageous to students as it allows them to use all their potential, especially their mental processes. The students are able to devise their own concepts as well as a few other mental processes that develop their critical thinking skills, characteristic of their holistic development as adults. In this way, students can also develop secondary concepts like self-esteem, decision making and analytical creativity.

Attitudes are defined as a tendency to provide consistent learning, positive or negative reactions to an object (A. Astalini et al., 2019; Bulunuz, 2015). A. Astalini et al. (2019) defines attitude as part of individual personality influenced by relationship behavior with it. Attitudes can also be defined as a tendency to act against people, things, events, or ideas. Attitudes seem unconscious, sustainable and closely related to opinion. Attitudes are formed as a result of the learning experience (Seferoğlu, 2004). A. Astalini et al. (2019) asserts that, attitudes are related to overcoming and managing

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emotions that occur during the learning process, and they play an important role in directing human behavior. Therefore, such emotions that can influence student behavior during the learning process can also influence their attitudes. Moreover, attitude of students influenced by emotions and feelings in such a manner can also potentially help students in learning cultural values (Agunbiade et al., 2017). Any student who behaves negatively towards cultural values has no interest in learning such values. Positive attitudes and interests in cultural values also provide a direction to students in shaping their careers (Welch, 2010).

Students who are inclined to learning cultural values and build attitude are in fact practicing positivism in their life. If they show a negative attitude to cultural values, they will also develop a negative attitude to their teacher (A. Astalini et al., 2019; Guido, 2018; Kurniawan et al., 2018). A teacher is therefore expected to understand students' attitudes during the learning process, because by knowing students' attitudes, teachers can improve the design of classroom learning, customizing it according to the students' abilities. One of the attitudes of students, which needs to be considered by a teacher is a scientific attitude. Trumper (2006) asserts that, scientific attitudes greatly influence the learning process. It is the responsibility of the lecturer to improve scientific attitudes and critical thinking of students. Students who have a high scientific attitude will have a faster growth of their learning, thus proving that scientific attitudes can shape students' thinking both creatively and critically. A major role to impart such an attitude is played by the lecturers who drive students to success (Cetin et al., 2019; Sofanudin et al., 2016).

Creative and innovative learning help students become proactive in solving problems both in in and out of classrooms. According to Kunnari et al. (2016) and Aybek et al. (2016), creativity and innovation in education are perceived or observed as new things or ideas to achieve scientific results. These results are achieved by one person or a group of people (society) in the form of new discoveries or inventions. These results are also attainment of educational or learning goals. During this whole process of attaining learning outcomes, lecturers monitor and control the act of learning through a variety of positive, adaptive or positive cognitive behavioral management strategies of teaching and learning. Rabgay (2018) asserts that lecturers need to use innovative and interactive teaching techniques and strategies to improve the teaching process. Students are only required to access knowledge and configure it independently (Tezer et al., 2019).

It is therefore evident that, in order to improve the quality of education, such teaching methods are required that can produce graduates who are creative and innovative, and also who have the courage to face challenges of life. One such method is the inquiry learning model. The Inquiry model is very suitable for use in learning activities as students are directed to carry out their own learning activities, such as formulating hypotheses, designing experiments, analyzing experiments, collecting data so that students can develop process skills (Syahrin et al., 2019; Wulandari, 2013). Several other studies (Cetin et al., 2019; Şimşek et al., 2010) have asserted that inquiry-based learning is effective in helping students develop critical thinking skills. Critical thinking is a high-level thinking skill, which focuses on deciding what to believe or do

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(Irwanto, 2018). Critical thinking is considered as the process of analyzing, applying, conceptualizing, synthesizing, and evaluating information produced by observation, reasoning, experience, communication, or reflection, as a guideline for beliefs and actions (Allen, 2008; Canziani et al., 2017; Irwanto, 2018). Inquiry-based learning is more than a teaching method; it is an educational philosophy where problem-solving skills are developed by participating in the acts of learning. Problem-solving skills refer to the ability of students to investigate solutions to a given problem or find a way to realize a given goal (Syahrin et al., 2019). Creative thinking is needed to generate ideas to solve problems and find new approaches. Meanwhile, work teams are often a key component to solving problems (Aybek et al., 2016; Winarno et al., 2018). Therefore, due to this collective paradigm, the inquiry learning model makes a good impact on learning. This inquiry-based learning model provides a way for students to build intellectual skills related to thought processes. Students work independently and in small groups to gain knowledge through their involvement (Aktekin, 2019; Gillette, 2017). Based on extant literature survey, it is evident that there is no dearth of studies on e-learning that discuss cognitive aspects, but very few studies have given attention to the integration of ethno-constructivism with cognitive and affective aspects. the current research aimed to fill the gap with this novel approach, namely the integration of ethno-constructive-based learning with e-learning to see the extent to which attitudes and critical thinking skills of students are developed. The purpose of this study was also to see whether the inquiry learning model assisted by ethno-constructivism modules with traditional print teaching materials used in lectures could improve student attitudes and critical students in learning.

Method

Research Design

The research design used in this study was a quasi-experimental and quantitative research design employing a nonequivalent control group design after testing. The study utilized causal hypotheses that could be manipulated by comparing one or more experimental groups treated with one untreated comparison group (Creswell, 2002). The design of this study was appropriate because it was in accordance with the objectives and research questions of the study, where the aim was to find out whether there were differences between attitudes and critical thinking students who used the inquiry learning model assisted by the ethno-constructivism module against the traditional printed teaching materials used in lectures. The research questions thus focused on the control and experimental groups and could be stated were as follows:

1. Is there any significant difference in the attitude of students to score between control and experimental group students?

2. Is there a significant difference in the critical skills score between control and experimental group students?

This research adopted the descriptive statistics comprising mean, minimum and maximum, and used inferential statistics based on independent sample t-test. Table 1 presents this scenario:

Table 1

Non-Equivalent Posttest Only Control Group Design

Group	Treatment	Posttest
Experimental	Inquiry Learning Model Assisted by The Ethno-constructivism Module	O_1
Control	Traditional printed teaching materials used in lectures	O_2

Research Sample

This study was located in elementary teacher education schools in Jambi Province, Indonesia. A total of 68 students from the sixth semester comprised the sample of this study. The sample was divided equally between one experimental and one control class of 34 students each. The experimental class was taught by adopting the inquiry learning model assisted by the ethno-constructivism module; while the control class was taught through traditional print teaching materials used in lectures. The purposive sampling method was used to identify and select the sample as it is a technique that suits the researcher's criteria (Kerlinger, 1966).

Data Collection Instruments and Procedures

The data collection of this study adopted a linear procedure (Creswell, 2002), as presented in Figure 1. The first step of this procedure was to collect data by distributing attitude questionnaires to students of semester six in the elementary school teacher education. The next step was to implement the inquiry learning model assisted by ethno-constructivism on the experimental class, while the control class continued with the traditional teaching materials. The next step was to make a comparison of the results of the questionnaires, ensuring to separately pair the results of attitudes and critical thinking of students of both experimental and control groups.
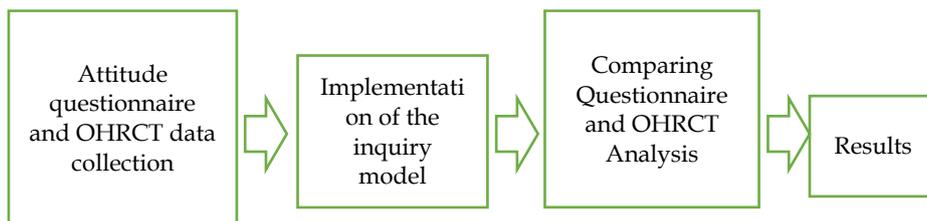

Figure 1. Research Procedure

The instruments used for data collection were questionnaire (to measure attitude towards for cultural values) and Oliver-Hoyo Rubric for Critical Thinking (OHRCT) for measuring students' critical thinking skills. The questionnaire for measuring students' attitude was adapted from Cohen et al. (2002). The questionnaire statements were measured on a 5-point Likert scale rated as Strongly Disagree (score of 1), Disagree (score of 2), Neutral (score of 3), Agree (score of 4), and Strongly Agree (score of 5). For negative statements, the score pattern was reversed with Strongly Disagree having a score of 5, Disagree having a score of 4, Neutral having a score of 3, Agree having a score of 2, and Strongly Agree, having a score of 1. The indicators examined under Students' attitudes included social implications, pleasure in learning, and interest in increasing the time to learn. Table 2 presents the three indicators of the questionnaire that measured attitude towards cultural values in five categories: Absolutely not good, Not good, Good, Enough, Good, and Very good:

Table 2

Categories of the Attitudes of Elementary School Education Students

Category	Interval Social Implications	Enjoyment in Learning	Interest in increasing the Learning Time
Absolutely Not Good	5.0 – 8.0	10.0 – 18.0	8.0 – 14.4
Not Good	8.1 – 12.0	18.1 – 27.0	14.4 – 20.9
Enough	12.1 – 16.0	27.1 – 36.0	30.0 – 36.4
Good	16.1 – 20.0	36.1 – 45.0	36.5 – 42.9
Very Good	20.1 – 25.0	45.1 – 54.0	43.0 – 49.4

The instrument for measuring students' critical thinking was OHRCT developed by Oliver-Hoyo (2003). which had six indicators namely abstract, organization of report, source of information, contents of the report, relevance of ideas, and presentation. The items of this rubric obtained the Cronbach alpha reliability coefficient of 0.84. Table 3 presents the six indicators that measured students' critical thinking

Table 3

Indicators of Critical Thinking

	Indicator
Critical Thinking	Abstract
	Organization of Report
	Sources of Information
	Contents of the report
	Relevance of Ideas
	Presentation

Data Analysis

All data obtained from attitude questionnaires (experimental class) and from OHRCT tool (control class) were collected and calculated with the help of SPSS 21 application at the significance level of 0.025. Descriptive statistics were obtained to calculate the frequency, percentage, mean, min, and max of sample (Creswell, 2002) in both control and experimental groups. The quantitative data was analyzed using parametric statistics of the independent sample t-test. Independent sample t-test was conducted to examine the effect of attitudes and critical thinking of students in both the groups.

The questionnaires were followed by short interviews or feedback sessions with the respondents, which helped to strengthen the results of the quantitative data. The main purpose of the interviews was to calculate frequencies such as ideas, themes, and behavioral patterns of students (Cohen et al., 2002).

Results

Students' attitudes can be judged by their own characteristics, namely feeling happy or unhappy, their likes or dislikes, being motivated or unmotivated. Attitude is a term that reflects someone's pleasure, displeasure or ordinary feelings towards something (A. Astalini et al., 2019). In inquiry-based learning, attitudes can enhance students' critical thinking about cultural values. Students who use learning to use inquiry will improve their critical thinking skills (Irwanto, 2018; Oliver-Hoyo, 2003). This study examined students' attitudes with regard to social implications, pleasure in learning, and interest in increasing the time to learn. On the other hand, students' critical thinking skills were measured by adopting Oliver-Hoyo Rubric for Critical Thinking (OHRCT) developed by Oliver-Hoyo (2003) and which obtained the Cronbach alpha reliability coefficient of 0.84.

Students' Attitudes

Social Implications of Students

The results of the social implication indicator in the attitude questionnaire for both experimental and control groups are presented in the table below (Table 4). Table 4 exhibits data obtained from the 34 respondents each of control and experimental groups belonging to the University of Jambi Elementary School teacher education study program. There were 25 female and 9 male participants in the control class; and 24 female and 10 male participants in the experimental class. Upon analysis, it was revealed that 27 out of 34 students in the control class rated social implications as Very Good, Good or Enough while 32 out of 34 students in the experimental Class held the same opinion. Of the 34 students in the control class, the mean value measured was 32.0, with the maximum value of 53 and minimum value of 14. For the experimental class, out of the 34 students, the mean value was 41.0, with the maximum value of 52 and the minimum value of 20.

Table 4

Results From Indicators of Social Implications of Cultural Values of Students' Primary School Teacher Education

	Category					**Mean**	**Min**	**Max**	**%**
	Interval	Female	Male	Attitude	Total				
Control Class	10.0 – 18.0	2	1	Absolutely Not Good	3				8.8
	18.1 – 27.0	2	2	Not Good	4	32.0	14	53	11.8
	27.1 – 36.0	9	6	Enough	15				44.1
	36.1 – 45.0	7	0	Good	7				20.6
	45.1 – 54.0	5	0	Very Good	5				14.7
	TOTAL	25	9		34				100
Experimental Class	Category					Mean	Min	Max	%
	Interval	Female	Male	Attitude	Total				
	10.0 – 18.0	0	0	Absolutely Not Good	0				0.0
	18.1 – 27.0	1	1	Not Good	2	41.0	20	52	5.9
	27.1 – 36.0	8	2	Enough	10				29.4
	36.1 – 45.0	12	6	Good	18				52.9
	45.1 – 54.0	3	1	Very Good	4				11.8
	TOTAL	24	10		34				100

Table 5

Results of Indicators of Enjoyment in Learning of Students at Primary School Teacher Education

	Category						**Mean**	**Min**	**Max**	**%**
	Interval	Female	Male	Attitude		Total				
Control Class	5.0 – 8.0	1	1	Absolutely Good	Not	2				5.9
	8.1 – 12.0	11	3	Not Good		14	10.0	7	22	41.3
	12.1 – 16.0	7	3	Enough		10				29.2
	16.1 – 20.0	4	2	Good		6				17.7
	20.1 – 25.0	2	0	Very Good		2				5.9
	TOTAL	25	9			34				100
	Category						Mean	Min	Max	%
	Interval	Female	Male	Attitude		Total				
Experimental Class	5.0 – 8.0	0	0	Absolutely Good	Not	0				0.0
	8.1 – 12.0	1	2	Not Good		3	17.0	10	24	8.9
	12.1 – 16.0	6	3	Enough		9				26.4
	16.1 – 20.0	13	3	Good		16				47.1
	20.1 – 25.0	4	2	Very Good		6				17.6
	TOTAL	24	10			34				100

Table 6

Results of the Indicator of Interest Increasing the Learning Time of Student Primary School Teacher Education

	Category						**Mean**	**Min**	**Max**	**%**
	Interval	Female	Male	Attitude		Total				
Class Control	8.0 – 14.4	0	1	Absolute Good	Not	1				2.9
	14.4 – 20.9	8	6	Not Good		14	18.0	12	46	41.2
	30.0 – 36.4	9	1	Enough		10				29.5
	36.5 – 42.9	6	1	Good		6				17.6
	43.0 – 49.4	3	0	Very Good		3				8.8
	TOTAL	25	9			34				100
	Category						Mean	Min	Max	%
	Interval	Female	Male	Attitude		Total				
Class Experiment	8.0 – 14.4	0	0	Absolute Good	Not	0				0.0
	14.4 – 20.9	2	0	Not Good		2	39.0	17	47	5.9
	30.0 – 36.4	8	3	Enough		11				32.3
	36.5 – 42.9	11	5	Good		16				47.1
	43.0 – 49.4	3	2	Very Good		5				14.7
	TOTAL	24	10			34				100

Enjoyment in Learning

The results of the questionnaire obtained from the indicators of 'enjoyment in learning' for both groups: experimental, based on inquiry model and control, based on the traditional method can be seen in the table below (Table 5). Table 5 presents data obtained from the 34 respondents each of control and experimental groups belonging to the University of Jambi Elementary School teacher education study program. There were 25 female and 9 male participants in the control class; and 24 female and 10 male participants in the experimental class. Upon analysis, it was revealed that 18 out of 34 students in the control class rated the indicator of pleasure in learning cultural values as Very Good, Good or Enough while 31 out of 34 students in the experimental Class held the same opinion. Of the 34 students in the control class, the mean value measured was 10.0, with the maximum value of 22 and minimum value of 7. For the experimental class, out of the 34 students, the mean value was 17.0, with the maximum value of 24 and the minimum value of 10.

Interest in Increasing the Learning Time

The results of the questionnaire obtained from the indicators Increase the learning time of Based on inquiry (experiment) and those who do not (control) can see in the table below:

Table 6 presents data obtained from the 34 respondents each of control and experimental groups belonging to the University of Jambi Elementary School teacher education study program. There were 25 female and 9 male participants in the control class; and 24 female and 10 male participants in the experimental class. Upon analysis, it was revealed that 19 out of 34 students in the control class rated the indicator of i. Interest in Increasing the Learning Time as Very Good, Good or Enough while 32 out of 34 students in the experimental Class held the same opinion. Of the 34 students in the control class, the mean value measured was 18.0, with the maximum value of 46 and minimum value of 12. For the experimental class, out of the 34 students, the mean value was 39.0, with the maximum value of 47 and the minimum value of 17.

Critical Thinking Skills

Table 7 presents the results of the questionnaire obtained from both the groups-- the students in the experiment class treated with inquiry-based model, and the control group, treated with the traditional method:

Table 7

Results of Student Critical Thinking Skills

Indicator	Groups	N	Mean
Abstract	Experimental	34	28.30
	Control	34	16.20
Organization of Report	Experimental	34	29.20
	Control	34	15.47
Sources of Information	Experimental	34	28.41
	Control	34	16.34
Content of the report	Experimental	34	28.00
	Control	34	15.70
Relevance of Ideas	Experimental	34	27.56
	Control	34	16.87
Presentation	Experimental	34	28.90
	Control	34	16.30

The data in Table 7 shows that the experimental group students were superior in all indicators compared to the control group students. this is evident of a significant difference between the scores of the two groups after treatment with respect to the mean value. Furthermore, the experimental group students obtained the highest average rating in the Organization of Report category (M = 29.20) and the lowest in Relevance of ideas category (M = 27.56) while the Control group students obtained the highest average rating in Relevance of ideas (M = 16.87) and the lowest in Organization of Reports (M = 15.47).

Table 8

Independent Sample T-Test for Attitudes to Cultural Values

	t	df	Mean	Std. Deviation	95% confidence interval	
					Lower	*Upper*
Attitudes	18.543	68	3.0906	.14321	18.236	.6120
	18.543	128.067	2.2033	.20015	17.935	.8615

Table 8 exhibits results of the independent sample t-test for attitudes to cultural values. The t-table value was calculated with a significance value of 0.025 (2-sided test) to get degrees of freedom (df) as 68. The value of t count as shown in the table is 18.543 which adheres to the hypothesis testing criteria and states that there is a rejection value of H0 (Cramer, 2003). So, it can be concluded that there is a significant difference in attitudes of students between the control classes taught using traditional teaching materials and experimental classes treated with the inquiry-based ethno-constructivism module. The average mean value of students' interest is showing 3.0906

which means the inquiry-based module can improve the attitude of students in learning cultural values.

Table 9

Independent Sample T-Test for Critical Thinking Skills Towards Cultural Values

	t	df	Mean	Std. Deviation	95% confidence interval	
					Lower	*Upper*
Critical Thinking	18.540	68	3.0912	.14321	18.134	.6120
	18.540	128.067	2.2033	.20015	17.885	.8615

Table 9 exhibits results of the independent sample t-test for attitudes to cultural values. The t-table value was calculated with a significance value of 0.025 (2-sided test) to get degrees of freedom (df) as 68. The value of t count as shown in the table is 18.543 which adheres to the hypothesis testing criteria and states that there is a rejection value of H0 (Cramer, 2003). So, it can be concluded that there are significant differences in students' critical thinking skills between the control classes taught with traditional teaching materials and experimental classes that used the inquiry-based ethno-constructivism module. The average mean value of students' interest is showing 3.0912 which means the inquiry-based module can improve the attitude of students in learning cultural values.

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Discussion, Conclusion and Recommendations

This study was an attempt to examine students' attitude towards inquiry-based learning model assisted by ethno-constructivism modules in contrast with the traditional learning methods. This attitude testing was done for three indicators: social implications, student enjoyment in learning, and interest in increasing the learning time. The results of the questionnaire obtained from the first indicator of social implications of Inquiry-based (experimental group) was categorized well with 52.9% and those who were treated with traditional methods (control group) were categorized sufficiently with 44.1%. These results were validated by obtaining opinion and feedback of students through interviews. The objective was also to integrate students' attitudes for each indicator with learning about cultural values.

The results of the interview for the first category of social implications suggested that even though learning cultural values was difficult for students, having to learn cultural values has been applied in the life of the community and brings many benefits in daily life. The respondents opined to some questions thus:

Q. "In your opinion, are inquiry-based cultural values a difficult lesson to understand? Explain the reason! "

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A. "No, because we can find cultural values in the environment"

Q. "Are there benefits or applications from learning cultural values in everyday life? Explain!"

A. "There is. You could say a lot. Because by studying cultural values we are involved in protecting and preserving the culture that surrounds us. "

The respondents' opinion are not too different form the opinion held by a few experts who also opined that cultural values contribute a lot to the development and concordance of life in this era (Arif, 2015; Rahman, 2013) and that students who appreciate the role of cultural values in everyday life only can perform well (K. D. Astalini et al., 2019; Cetin et al., 2019).

The second indicator of students' enjoyment in learning also received similar response as revealed from the data analysis. The participants in the experimental class who were treated with inquiry-based model numbered about 47.1% to have derived pleasure from learning, while about 41.3% of the control group (traditional) enjoyed their learning. The results indicate that students' attitude towards deriving pleasure in learning cultural values is sufficient and the average response is positive. Likewise, the responses of the interviews with students also revealed their positive attitude towards learning cultural values. A few of them offered the reason saying that learning about material values only help you to tackle life's challenges but learning cultural values is a pleasant experience. A few comments are transcribed verbatim below:

Q. "Do you like learning about cultural values? What is the reason!"

A. "I am glad to study cultural values as it has many advantages. Moreover, studying in comfortable classrooms makes the learning further pleasant and helps me better understand the lessons of cultural values. I am happy to learn them."

These findings are in line with Al (2012) and Shufa (2018) who stated that the pleasure component affects the learning of good cultural values and provides predictive effects. Further, K. D. Astalini et al. (2019) also agreed that the positive attitude of students and deriving pleasure from learning cultural values is due to comfortable classrooms that add the fun element in learning and enhances it. By experiencing positive emotions and pleasure in learning also improves students' self-perceptions and well-being (Kirom, 2018; Siburian et al., 2019).

The responses received for the third indicator of taking interest in increasing the learning time for experimental group was also consistent and not much different from the previous two indicators. A total of 47.1% accepted that they felt interested in increasing the learning time and 41.2% remarked that they did not. The students' attitude for this indicator also shows their interested in investing their time in learning cultural values. Their responses to the interview questions also suggest their taking initiative and spending extra time in learning cultural values both at home and in school, individually or in groups. This is evident in their remarks made in the interview:

Q. "When you come home from school, do you review study material on cultural values at home?"

A. "Yes, but only occasionally when I feel the need to review the study material."

Q. "If there is any such material that you do not understand at school, what do you do?"

A. "If I do not understand any material at school, I go to the library and ask the teacher or friend during recess or when there are free hours to help and guide me."

This clearly shows students' willingness to spend extra time or take initiatives in learning about cultural values. This could be ascribed to their taking pleasure in learning cultural values that encourages them to increase the time to learn them. This is consistent with Syahrin et al. (2019) and Bulunuz (2015) who think that students' interest in spending time to learn cultural values is an important attitude. It makes them serious about their learning in general. Suastra (2010) and Kirom (2018) also agreed that students' interest in learning cultural values help in predicting their long-term persistence in learning and developing a high positive attitude towards improving learning outcomes. Manurung (2011) and Zinnurain et al. (2018) specifically mentioned that students interested in increasing the learning time of cultural values get better results in science subjects such as physics.

Table 7 results show unsatisfactory performance of both the groups in critical thinking skills; however, the experimental group students were superior in all indicators compared to the control group students. This is evident of the treatment given to the experimental class by using inquiry-based learning model assisted by the ethno-constructivism module against the traditional printed teaching materials used in lectures. Before the treatment, all students in both the groups had similar prior knowledge. Regarding students' low critical thinking skills, we concluded that they faced difficulty in solving their problems due to the traditional methods used by lecturers during learning. This proves that students taught through conventional methods tend to obtain less than optimal performance (Duran et al., 2016).

Thus, the findings of the study obtained from the implementation of the inquiry learning model assisted by the ethno-constructivism module have proved that the inquiry learning model is effective in increasing students' critical thinking as well as attitudes towards learning cultural values. Conversely, this has also been proved that if students have a positive attitude towards learning cultural values, it will also have a positive impact on their critical thinking skills. This reaffirms the premise taken in this study that learning is a characteristic of cognitive, affective and psychomotor activities, because indicators that act relatively stable for learning are interconnected and react to the learning environment (Keefe et al., 1990) and that attitudes have factors that can influence social and internal conditions (Craker, 2006).

Last, but not the least, in the current times it is much easier to transfer learning through ICT products and multimedia services such as audio, video, high-resolution

graphics, etc. which can aid the thought process of learners. Wongwatkit et al. (2017) and Zheng et al. (2018) strongly advocated the use of a personalized mobile learning system to support guided inquiry learning activities for secondary school students. They found that a mobile learning system also helps in a significant increase of students' learning attitudes.

Conclusion

The results of this experimental study have led to a few conclusions: First, the implementation of an inquiry learning model assisted by the ethno-constructivism module increases students' critical thinking as well as attitudes towards learning cultural values. Second, indicators like taking pleasure in learning and also willingness to devote extra time in learning cultural values are very common among most students. Third, the unsatisfactory performance of all students in both groups, experimental and control, proved that the use of traditional teaching methods was responsible for their low critical thinking skills. It is therefore recommended that teachers should eliminate the traditional methods from their teaching and adopt more inquiry-based learning style. There are significant differences seen in the experimental class after using the inquiry learning model assisted by ethno-constructivism modules. So, it is suggested to introduce such modules in teaching cultural values at all levels of learning. It is also recommended that pre-service teachers need to be given the opportunity to develop direct experiences and thoughts about cultural values and devise activities to teach these values. The lecturers must also incorporate the inquiry learning model assisted by the ethno-constructivism module to develop their learning tools, directing at enhancing the skills and attitudes of students towards cultural values.

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