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Application of Contextual Teaching and Learning Model to Improve Disposition and Creative Thinking Skills of High School Students

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Abstract: Facing the challenges of the 21st century, learning must be able to produce learners into creative individuals to solve problems. The ability to think creatively is closely related to a person's character or creative habits; good character can trigger good skills. This study aims to determine how applying the Contextual Teaching and Learning (CTL) model improves students' creative disposition and creative thinking skills. The method in the form of Quasi-Experimental Design uses Pre-test and post-test control Group Design on as many as 64 X students at one of Aikmel State High Schools, NTB. The 32-person experimental class used the CTL model of the guided inquiry method, and the 32-person control class of the discussion method. Data on students' creative dispositions were collected using creative disposition questionnaires given before and after good treatment in both groups. Data on students' creative thinking skills were collected with a creative thinking skills test developed referring to the Torrance Creative test. The data were obtained and analyzed using the t-test to determine the comparison of the two classes and the N-gain test to see the improvement in each class. The results showed significant differences in creative disposition and creative thinking skills between the experimental class and the control class. Increased creative disposition in the experimental class with an N-gain of 0.45 means an increase in the medium category and an N-gain of 0.08 in the control class, which means an increase in the low category. Meanwhile, the creative thinking skills of experimental class students amounted to an N-gain of 0.48, which means there was an increase in the medium category, and an N-gain of 0.05 in the control class, which means there was an increase in low theory. This study concludes that applying the CTL model can improve creative disposition and thinking skills.

Keywords: Creative Disposition; Creative Thinking Skills; Model Contextual Teaching and Learning.

Introduction

Education is very closely related to learning and learning, so it is not easy to separate and distinguish. Learning is a continuous effort that results in permanent changes in abilities, behaviours, or attitudes in a person, and it is the result of experience and interaction with the outside world [1]. Learning is a series of events or activities that can have a major influence on learning in order to facilitate the learning process. Changes in the behaviour or ability of a learner can be sought or facilitated by these learning activities [2].

The rapid development of science and technology in the 21st century requires individuals to become quality human resources who are able to manage, use, and develop their thinking power, especially the ability and skills in higher-order thinking, one of which is creative thinking [3]. Creative thinking is a thought that seeks to create new ideas. Creative thinking can also be interpreted as a mental activity that a person uses to build new ideas or ideas. Creative thinking can bring out one's potential (hidden talents) in humans [4].

Creative thinking skills can be trained for all students through a lesson. Learning will be easy to carry out to achieve maximum goals if the initial ability of students in terms of creative thinking is known [5]. To know someone can think creatively is needed the determining indicators. In Torrance's opinion, four indicators of creative thinking skills [6] are Fluency, Flexibility, originality, and elaboration.

Creativity means that learning is a process of developing students' creativity because every individual has imagination and curiosity that never stops. Thus, teachers must create diverse learning activities so that all students' potential can develop optimally [7]. Creativity is a person's ability to express ideas or ideas through the creative thinking process to create something that requires concentration, attention, willpower, hard work, and perseverance [8]. Creativity has a very important role in the teaching and learning process, especially for students. Creativity must exist in students as a potential creative disposition [9]. A creative person must also be seen not only from the point of view of his skills and abilities but also from the creative character of students, which also needs to be developed [10].

Meanwhile, research on creativity is widely carried out but only studies students' creative knowledge or skills. However, few still discuss and conduct studies on students' creative dispositions. Crow and Kastello [11] state that not only students' skills and knowledge must be measured, but students' dispositions can also contribute to success and success in the future. Widodo [12] stated that skill and

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disposition are two sides of a coin that cannot be separated.

Disposition is a person's tendency to think and do things under conscious and voluntary control, deliberately oriented towards a broader goal [13]. Creative disposition can be defined as an innate character from within students, and this character can be further enhanced through teaching in the classroom by teachers creatively [14]. According to Lucas, Claxton, and Spencer [15] stated that five aspects need to be measured through indicators of creative disposition, namely, inquisitive, persistent, imaginative, collaborative, and disciplined.

The creative disposition and creative thinking ability of students can be developed through an active and student-focused learning process using the right learning model or method. The Contextual Teaching and Learning model is a learning model that emphasizes the learning process that emphasizes full student involvement to be able to find the material learned and relate it to real situations so as to encourage students to apply it in their lives. This learning model occurs if students apply and experience the focus of the material they are learning at that time, which is closely related to the real experience. CTL also expands the context of students' personal lives through the provision of fresh learning experiences that will stimulate the brain to make new connections and find new meanings [16]. This learning model itself emphasizes student activeness in learning material, so that it is expected to improve the ability of students.

Learning research based on the application of the CTL model related to creative disposition is still rarely carried out, especially in biology subjects, so it is important to do so to obtain what kind of student learning activities can foster students' creative dispositions. Integrating the application of the CTL model into learning is expected to foster students' creative disposition and ultimately also improve students' creative thinking skills. The results of this research will provide information on how to improve students' creative disposition and creative thinking skills.

Based on the description above, researchers feel compelled to research the application of the Contextual Teaching and Learning learning model to Improve the Disposition and Creative Thinking Skills of grade X High School Students on the subject of environmental change and preservation at SMAN 1 Aikmel for the 2022/2023 school year.

Research Methods

This research was carried out on grade X students in the Odd Semester of the 2022/2023 Academic Year at one of Aikmel State High Schools. The research subjects amounted to 64 students, who were divided into 32 students in the experimental class and 32 students in the control class. The selection of research subjects was determined using purposive sampling techniques with the consideration that students had the same average score for the class to be treated and controlled. The research uses a quasi-experimental design that applies the Contextual Teaching and Learning (CTL) learning model of guided inquiry methods in experimental classes and learning using discussion methods in control classes.

Data collection was carried out using creative disposition questionnaire instruments, creative thinking skills tests, and student activity observation sheets. Questionnaires are used to measure students' creative character and determine the position of students' creative dispositions compared to their peers. The type of questionnaire with the closed answer type uses a Likert scale of 1-5. The creative disposition questionnaire used in this study refers to instruments developed by Sukarso [17], which refers to indicators from Lucas, Claxton, and Spencer [15]. The creative thinking skills test, in the form of 18 multiple-choice questions with reason, is used to measure students' creative thinking abilities compiled and developed by researchers on material change and environmental conservation. This test instrument has been analyzed for validity, reliability, difficulty, and differentiating power. The test questions developed refer to Torrance's Test of Creative Thinking (TTCT), which includes indicators of fluency, flexibility, originality, and elaboration [6]. The assessment of test results was carried out based on the rubric of creative thinking skills developed by Sukarso [17]. Student teaching activities are observed using observation sheets based on the syntax of the CTL learning model. Both classes are given creative disposition questionnaires and creative thinking skills tests before and after learning (pre-test and post-test).

Research data in the form of quantitative data, namely pre-test and post-test scores, creative disposition questionnaires, and creative disposition position questionnaires on a scale of 1-5. Creative thinking skills data in the form of quantitative data on pre-test and post-test scores for creative thinking skills are scored on a scale of 0-3 for each statement, and then the total score is converted to a scale of 0-100. The collected students' creative disposition data and creative thinking skills were then statistically analyzed with the t-test and N-gain test. The t-test is intended to see the difference in the treatment results given in the experimental and control classes. The N-gain test is intended to determine the category of improvement that occurs in creative disposition and creative thinking skills. The calculation of N-gain refers to the categorization by Hake [18], as shown in Table 1. All statistical tests were conducted with the help of the SPSS Ver 16.0 program. Student activity data is converted into percentage form to reinforce the success picture of the CTL learning model in improving students' creative disposition and creative thinking skills.

Table 1. Interpretation of the N-Gain Test

Normalized Gain	Classification
$g > 0.70$	High
$0.30 \leq g \leq 0.70$	Medium
$g < 0.30$	Low

Results and Discussion

Application of CTL Learning Model to Enhance Creative Disposition

The results of research and data analysis regarding the creative disposition of students in the experimental and control classes are concise, as presented in Table 2.

Based on Table 2, both sample classes' pre-test and post-test scores have normal data distribution and homogeneous data variance (sig. > 0.05). The pre-test

scores did not differ significantly, which meant that the creative disposition of experimental and control class students at baseline (before treatment) was the same. The post-test scores of the creative disposition of experimental class students increased higher and differed significantly from those of control class students. The average post-test score shows a Sig. (2-tailed) value of 0.000 or less than 0.05 means Ho is rejected or Ha is accepted. This means that the application of the CTL learning model of guided inquiry methods has a significant effect on improving students' creative disposition.

Table 2. Recapitulation of pre-test and post-test scores and statistical tests of creative disposition

Component	Experimental Class		Control Class	
	Pre-test	Postest	Pre-test	Postest
Number of Students	32	32	32	32
Average Score	2.72	3.78	2,88	3,05
Standard Deviation	0.784	0.419	0,640	0,078
Minimum Score	1.0	3.0	1,8	1,9
Maximum Score	4.2	4.6	4,1	4,2
N-gain		0.45 (Medium)		0,08 (Low)
Normality Test	0.994 (Normal)	0.104 (Normal)	0.852 (Normal)	0.676 (Normal)
Homogeneity Test	0.204 (Homogen)	0.162 (Homogen)	0.205 (Homogen)	0.161 (Homogen)
Test mean difference (t-test) pre-test score with significance 0.05			Sig. (2-tailed) = 0.362 α > 0.05 means that Ho is accepted	
Test mean difference (t-test) post-test score with significance 0.05			Sig. (2-tailed) = 0.000 α > 0.05 means Ho rejected	

The results also showed that the achievement of students' creative disposition in the experimental class experienced a better change, judging from the average N-gain score of 0.45, which means an increase in the moderate category. Meanwhile, the control class N-gain resulted in an average N-gain of 0.08, increasing the low category. This indicates that the application of the CTL learning model of the guided inquiry method in the experimental class is better than the learning of the discussion method in the control class in improving the creative disposition of students. The full N-gain increase of each domain of creative disposition between the experimental class and the control class can be seen in Figure 1 and Figure 2.

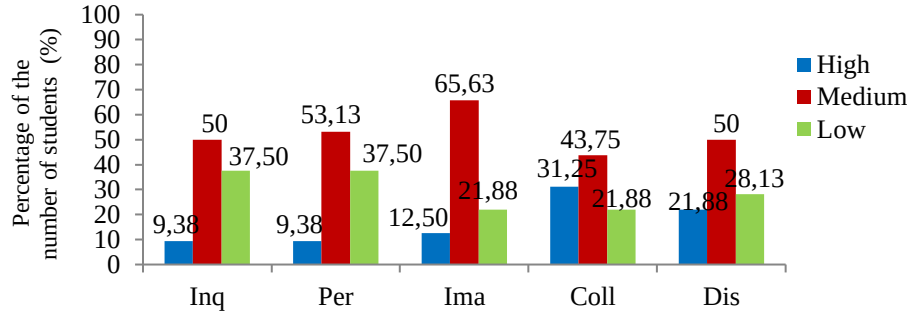

Figure 1. Percentage of N-gain score per domain in the experimental class

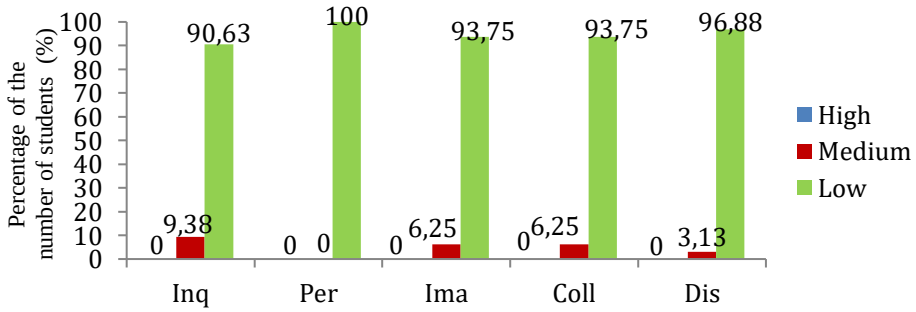

Figure 2. Percentage of N-gain score per domain in the control class

Ket: Inq = *Inquisitive*, Per = *Persistent*, Ima = *Imaginative*, Coll = *Collaborative*, Dis = *Disciplined.*

Based on Figure 1, the percentage of experimental students is grouped into three categories, namely high, medium, and low. In Figure 2, the control class students were grouped in the medium and low categories; students who occupied the high category were not found. The medium category was the most dominating category in the grouping of the increase (N-gain) of students' creative disposition in the experimental class. In contrast, in the control class, it was the low category. The creative disposition domain in the experimental class that experienced the highest increase was shown in two domains, namely collaborative and disciplined, while in the control class, only in the inquisitive domain.

The above findings are also supported by the results of a questionnaire on the position of students' creative disposition towards the use of the CTL learning model in experimental classes, which resulted in 3.76% of students feeling able to stimulate their curiosity, trigger the emergence of tenacious characters, trigger the emergence of imaginative thinking and develop a level of mastery of concepts. Therefore, the results of this creative disposition research are equivalent to the research data on students' creative disposition positions compared to their peers. This means that after giving the CTL learning model with the guided inquiry method, students feel more confident in the position of creative disposition, so the results bring out the confidence in students compared to learning with the discussion method. The phenomenon found in this study is in line with the opinion of Runco and Acar [19], stating that all indicators, both curious, persistent, imaginative, collaborative, and disciplined, can be improved by treatment that trains students in creative habits, such as the use of challenging learning models. In this study, the use of CTL guided inquiry method seems to be more challenging than the use of the discussion method in learning, so the results tend to be better.

Inquisitive Domains

One of the syntaxes of the CTL learning model plays a role in improving the character of curiosity, namely the syntax of Question. Questioning activities in applying CTL learning will encourage students to always reject an opinion, idea, or theory without evidence. They can trigger students to seek and explore various theories by developing questions far or wide. Student activities optimize questioning activities on the application of CTL learning to make observations, determine problem formulations, and make hypotheses by students themselves, which allegedly can stimulate student curiosity. According to Watson [20], people with curiosity are very active in asking questions. Students ask questions to improve their cognitive knowledge and are usually not limited to a specific subject. According to Gultom [21], the ability to make questions can train students to focus more on the material being read, and the process of asking questions makes students focus their attention on understanding new or unknown information [22].

Persistent Domains

The application of CTL learning model syntax plays a role in improving the character of student tenacity, namely inquiry syntax which is optimized with students finding problem formulations and compiling hypotheses from information obtained through observation and data analysis. Students can discuss with a larger scope so that students will practice to dare to exchange opinions to find possible answers or solve problems together with other friends. This assumption aligns with Graham's research [23], which states that the application of active learning, which includes activities that emphasize students' thinking activities, analyzing, and solving problems, can increase student tenacity and persistence. Robson and Rowe [24] state that students' persistent and tenacious character appear efficiently in activities that free students to empower their learning resources and knowledge. Robson and Rowe also added that interaction with peers can make students more willing to engage in challenging activities such as discussions in learning. However, teacher support and direction in student learning are still needed.

Imaginative Domains

The application of CTL learning model syntax that plays a role in improving students' imaginative character, namely constructivism syntax, which is optimized with class discussion activities to find problem-solving, compile hypotheses, present and develop data analysis, and find solutions and their benefits in everyday life, and make conclusions based on the data that has been collected. Students also discuss generating solutions and imaginary possibilities in designing ideas that they want to plan in everyday life. Class discussion activities give students the freedom to empower their thinking and use intuition, connecting their knowledge with the results of data collection to propose possible answers that can train students' imaginative character. Murphy [25] argues that when conducting discussions, one will exercise one's imagination through statements. In addition, when trying to understand a phenomenon, someone will explore with their imagination to find out the elements that exist in the phenomenon. Hadzigeorgiou [26] revealed that several strategic activities can be done to improve students' imagination abilities, such as investigating a phenomenon or problem, keeping a daily journal for students, providing various questions that can reveal between facts and students' ideas, combining science learning approaches with product making.

Collaborative Domains

The syntax of the CTL learning model that plays a role can improve the character of cooperation, namely the syntax of inquiry, constructivism, and learning community. In syntax, inquiry and constructivism are carried out with group discussions and class discussions. These activities provide space for each student to exchange answers and various kinds of ideas or opinions. Similarly, in the syntax of the learning community, by joining a group, friends will be able to exchange ideas with each other and provide input to other groups as well, so that it will be able to train the character of student cooperation. Group discussion activities and class discussions will give students the opportunity to practice adjusting how to work together in smaller and larger scopes. According to Warsono and Hariyanto [27], learning emphasizing student group activities can train student cooperation to build knowledge and achieve learning goals. The results of Susetyarani's research [28] indicate that problem-based learning can improve students' ability to work together. CTL applied in this study has conditions with activities that demand cooperation; thus, the application of CTL can foster the character of student cooperation.

Disciplined Domains

One of the syntaxes of the CTL learning model that plays a role in increasing knowledge mastery is the syntax

of modelling and constructivism. In modelling syntax, students try to hone their skills in solving problems by trying to provide examples and communicate based on their experiences in everyday life. Constructivism syntax is done by comparing data obtained between groups, making students try to respond to the problem with the knowledge that has been obtained. Students will be more focused on solving problems and understand more about the correct stages for investigating and applying them to everyday life. Through these activities, students can realize the shortcomings or advantages of their investigations' results to be improved and improved. Jung [29] stated that self-efficacy (self-assessment) is the beginning of the character of knowledge mastery. Self-efficacy makes a person understand his strengths and weaknesses as a motivator to achieve goals and increase the achievement of higher success. Self-efficacy is related to the ability to make decisions for mastery of knowledge. Mastery of knowledge can serve to develop long-term academic skills.

Application of CTL Learning Model to Improve Creative Thinking Skills

The research and data analysis results regarding students' creative thinking skills in experimental and control classes are concise, as presented in Table 3.

Table 3. Recapitulation of pre-test and post-test scores and statistical tests of KBK

Component	Experimental Class		Control Class	
	Pre-test	Postest	Pre-test	Postest
Number of Students	32	32	32	32
Average Score	24.03	59.65	22.18	25.89
Standard Deviation	10.88	13.97	10.41	9.56
Minimum Score	6	30	5	10
Maximum Score	54	90	52	55
N-gain		0.48 (Medium)		0.05 (Low)
Normality Test	0.881 (Normal)	0.757 (Normal)	0.985 (Normal)	0.998 (Normal)
Homogeneity Test	0.672 (Homogen)	0.104 (Homogen)	0.642 (Homogen)	0.104 (Homogen)
Test mean difference (t-test) pre-test score with significance 0.05			Sig. (2-tailed) = 0.473 α > 0.05 means that Ho is accepted	
Test mean difference (t-test) post-test score with significance 0.05			Sig. (2-tailed) = 0.000 α > 0.05 means Ho rejected	

The results of this study showed that the pre-test scores of experimental and control class students were not significantly different, meaning that the creative thinking skills of class students at first (before treatment) were the same. After treatment, the students' creative thinking skills (post-test scores) of the experimental class improved significantly and differed significantly from those of the control class students. The average post-test score shows a Sig. (2-tailed) value of 0.000 or less than 0.05 means H0 is rejected or Ha is accepted. This means that the application of the CTL learning model has a significant effect on improving students' creative thinking skills.

The results also showed that students' creative thinking skills in the experimental class experienced better changes, judging from the average N-gain score of 0.48, which means an increase in the moderate category. At the same time, the control class N-gain resulted in an average N-gain of 0.05, which means an increase in the low category. This indicates that the application of the CTL learning model of the guided inquiry method in the experimental class is better than the learning of the discussion method in the control class in improving students' creative thinking skills. The complete increase in N-gain of each indicator of creative thinking skills between the experimental class and the control class can be seen in Figure 3.

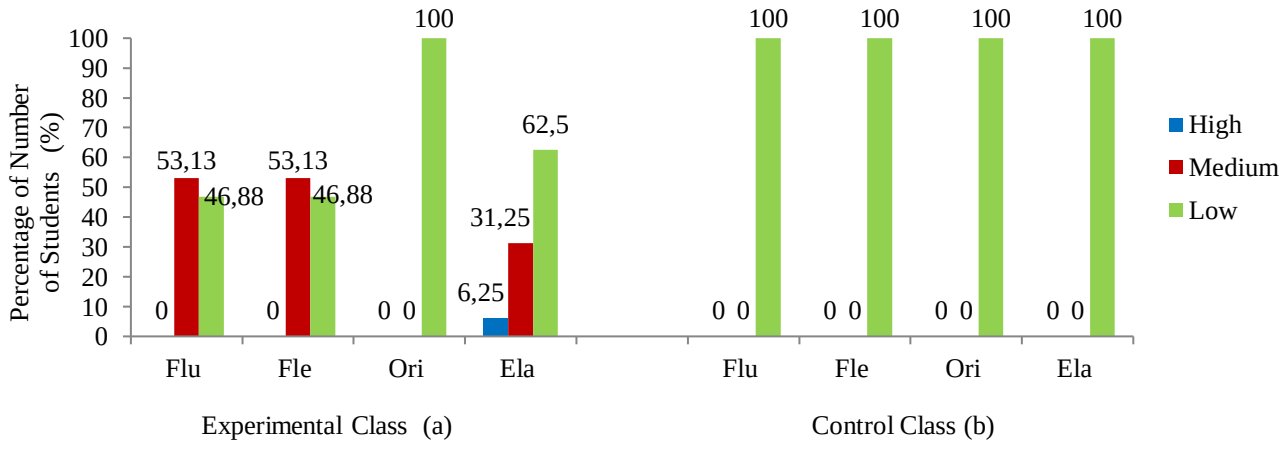

Figure 3. Percentage of N-gain score per domain in experimental class and control class
Ket: Flu = *fluency*, Fle = *flexibility*, Ori = *originality*, Ela = *elaboration*

Based on Figure 3, the percentage of experimental class students is grouped into three categories, namely high, medium, and low categories. While the control class students were all grouped in the low category, none found students occupying the high and medium categories. The category that dominated the most in the grouping of the increase (N-gain) of students' creative disposition in the experimental class and control class was the low category. Although both classes are in the low category, there is a prominent difference. In the experimental class, the indicators of creative thinking skills that experienced the highest increase were shown in flexibility and fluency, followed by elaboration and the lowest originality indicator. While in the control class, all indicators experienced a low increase.

This study shows the results of increasing creative thinking skills in harmony with increasing creative disposition. In contrast, in the experimental class, the increase in creative disposition and creative thinking skills are both in the medium category. Likewise, the control class, creative disposition, and creative thinking skills are in the low category. This is in line with research conducted by Sukarso [30], which shows that increasing creative disposition also increases the ability to think creatively. Creative thinking skills reflect creative disposition because if the disposition results well, it can affect the results of good creative thinking skills. The character of creative thinking people tend to have curiosity, tenacity, imaginative power, cooperation, and mastery of knowledge, which can trigger students to have creative thinking skills, which include fluency thinking, flexibility thinking, original thinking, and elaboration thinking. Having good character can also trigger good skills, so the ability to think creatively is closely related to creative disposition. This is reinforced by Widodo [12], who stated that creative disposition and creative thinking skills are inseparable, so it is analogous to two complementary sides of a coin. This finding explains that the application of the CTL model can trigger the development of students' creative thinking skills in thinking fluency, flexibility, originality, and elaboration. In this study, students demonstrated active learning activities driven by CTL syntax that included constructivism, inquiry, questioning, community learning, modelling, actual assessment, and reflection activities.

Fluency Indikator

Fluency thinking is known for the ability to think with a variety of new thoughts. One of the syntaxes of the CTL model, namely constructivism and inquiry, that is optimized with class discussion, plays a role in improving students' fluent thinking. In the constructivist syntax, there are activities to explore students' initial abilities or students' initial knowledge by conducting questions and answers by the teacher. These activities will stimulate the way of thinking or initial knowledge of each individual student, thus providing time for students to issue their ideas. In the inquiry syntax, there are activities to determine problem formulations, compile hypotheses, and analyze and present data by students. This activity will stimulate students to generate ideas in determining problem formulation, how to determine and compile hypotheses, and how to analyze data from a problem faced by means of class discussion so that it will give students the opportunity to propose the answer they thought of. Research by Algiani [31] states that learning in the form of problem presentation, hypothesis preparation, and data analysis is suspected to be the cause of the development of students' fluent thinking skills. The presentation of problems leads to student activeness in learning goal-setting activities by students themselves. Hypothesis preparation and data analysis are carried out through class discussions that provide opportunities for students to propose various answers that come to mind. Maria continued [32] stated that learning carried out through group discussions causes students to seek additional information about phenomena related to learning, analyze the information they have obtained, and, through this activity is able to provide opportunities for students to express answers that cross their minds. Fatmawati's research [33] suggests that the application of creative learning models based on problem-solving has a significant influence on students' fluency in thinking.

Flexibility Indicator

Flexibility describes a person's ability to overcome obstacles by formulating various ways to overcome a problem [6]. The application of the CTL model through inquiry syntax can improve students' divergent thinking. In the inquiry syntax, students are asked to find steps in determining the formulation of problems that must be solved and determine how to analyze and process data so that they can present results and conclusions can be drawn. In this syntax, students are guided to make a more detailed investigation plan during the data collection process. Nurisalfah's research [34] states that students' different thinking is quite good after students are trained to plan projects. Sukarso and Muslihatun's research [35] indicates that authentic research project-based practicum activities stimulate creative thinking, foster the freedom to decide what to do and how to do it, foster new ideas, and strengthen students' ability to produce research plans.

Originality Indikator

Original thinking (originality) is a person's skill in producing new ideas. The individual sees new relationships or combinations between elements. The more elements combined into one creative idea or product, the more original the individual's thinking will be [6]. The syntax of the CTL model, namely Inquiry, Constructivism, and Reflection, can improve students' original thinking. These three syntaxes are carried out with class discussion activities, where students are free to contribute by providing opinions to answer problems in class.

In contrast to these allegations, the original thinking study showed that all students (100%) were in the low category. The low efforts of students to improve original thinking in this study include important aspects that must be considered. CTL does not seem to provide stimulation for students to develop themselves and increase their knowledge of original thinking. This shows that triggers are still needed that can increase students' original thinking skills, for example, by listening to much exposure to ideas produced by others. This is reinforced by Sannomiya and Yamaguci [36], who revealed that hearing the exposure to

ideas generated by others has the potential to train creative thinking skills. Exposure to ideas submitted by others can stimulate the production of one's ideas. The results of his research revealed that many of the ideas produced were influenced by the ideas of others he had heard. The more individuals hear the exposure of other people's ideas, the more they generate ideas. Studies conducted by Agogue [37] also indicated similarly that participants who heard many examples of unique ideas were able to generate more original ideas than participants who were exposed to general ideas.

Elaboration Indikator

Elaboration or detailed thinking is the ability to develop, enrich, or expand an idea that has been made so that it becomes more detailed [6]. The syntax of the CTL model, namely constructivism and inquiry, can improve students' detailed thinking. Both syntaxes provide opportunities for students to analyze, decipher, explain, express opinions, and draw conclusions from the results of the data obtained. Students can make presentations or present detailed schematics of data analysis results, relationships between problems, problem solutions, and benefits, and make conclusions per the material taught to practice detailed thinking skills. The results of research by Putri [38] and Amirullah [39] indicate that the application of mind mapping-based learning has a significant influence on improving students' detailed thinking skills. Mind mapping can help students create a more concise picture of their creative ideas as well as help students look at problems from a broad perspective.

Student Activities in the CTL Learning Model

The research and data analysis results regarding student learning activities in experimental and control classes are concise, as presented in Tables 4 and 5.

Table 4. Average student scores (in percent) on the CTL learning model indicator of the guided inquiry method

No	Indicators	Meeting		
		1	2	3
1	Invitation	38.02%	43.75%	51.04%
2	Exploration	54.69%	61.56%	64.22%
3	Solution	55.21%	67.97%	70.31%
4	Action Taking	38.02%	48.96%	53.38%

The success criteria for student activities in this study are said to be effective if at least 51% of students are actively involved in the learning process. Table 4 shows the results of obtaining the value of student learning activities by applying the CTL learning model, the guided inquiry method, in the experimental class. Shows that the average score of the percentage of students for each indicator during the three meetings always increases. The results of the data show that the increase in each meeting indicates that there is an impact on the treatment of the application of the CTL model in increasing student activity during the learning process. Meanwhile, based on Table 5 in the control class, the average score of the percentage of students on each indicator during the three meetings also increased, but the increase occurred very slightly and did not exceed the success criteria. This indicates that applying the CTL learning model of the guided inquiry method in the experimental class can be effective, compared to the control class that uses the discussion method learning, which can be less effective.

Table 5. Average student scores (in percent) on discussion method learning indicators

No	Indicators	Meeting		
		1	2	3
1	Convey goals	36.72%	36.72%	38.28%
2	Convey information	42.97%	46.88%	48.44%
3	Check to understand and provide feedback	28.91%	31.77%	30.99%
4	Provide advanced practice opportunities	26.17%	27.34%	27.73%

This result is because, in the learning process activities, teachers observe more student activities, provide motivation, and provide guidance compared to providing material explanations. Students are actively involved in discovering the material being studied and relating it to real-life situations. The teacher provides many opportunities for students to actively learn, which indicates that learning activities are in accordance with the view of constructivism, where the teacher does not give knowledge casually but helps students build their knowledge. Baker [40] suggests that the use of CTL based on constructivism theory is a conceptual framework given to learners to constantly update their memories based on ongoing experiences, helping students see the usefulness of certain skills as they are associated with real-life problem-solving situations. Furthermore, Kalchik and Oertle [41] stated that CTL learning is able to help students create their concept meanings through experience in the learning process so as to increase student motivation for learning desires.

Conclusion

Based on the results of data analysis and discussion, it was concluded that the application of the Contextual Teaching and Learning learning model to grade X high school students of SMAN 1 Aikmel can trigger the growth or emergence of students' creative dispositions in the subjects of environmental change and preservation at the level of change in the medium category, Especially prominent in the realm of increasing the domain of cooperation (collaborative) compared to the domain of curiosity (inquisitive), persistence (persistent), imaginative (imaginative), and mastery of knowledge (disciplined). Students' creative thinking ability also increased at an increased rate in the moderate category, especially in improving aspects of fluency and flexibility compared to original thinking (originality) and detailed thinking (elaboration).

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