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Assessing Students' Creative Thinking Skills Through The Science Practicum Kit In The Development Of The Madrasah Program

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Abstract. Study this aim to analyze the ability to think creatively with the use of Microsains KIT on the madrasah program. A draft study this using "Control Group Design". Sample study this is student class VII MTs Raden Umar Said Colo, class VIIB as control, and class VIIA as group experiments that do learning with use comfort KIT on Theory physics in life every day. The variables studied cover Skills to think creatively among students. as an indicator of the ability to think creatively covers Skills of Think fluency, skill thinking flexibility, skill thinking originality, skill elaboration (Elaboration), and Thinking evaluation (evaluation). Measurement ability thinks creative student conducted with To do Pre-test and post-test. Results study prove that learning using the Microsains KIT in a manner significant ($p<0.05$) can increase smoothness and flexibility in thinking, as well as increase participation participant in activity discussion and practice increase Skills thinking original, Skills detail (elaboration) and Skills Thinking to evaluate (evaluate).

Key words: Creative Thinking Skills; Practicum KIT

INTRODUCTION

Community service is part of the Tridarma of higher education which must be carried out for lecturers in addition to teaching and research activities. The Tarbiyah Faculty of IAIN Kudus is one of the teaching staff education institutions (LPTK) which has a mission including carrying out service in the field of education and learning to educational institutions and the community as well as another mission, namely to build professional partnerships and collaboration with various educational institutions and other related institutions at the level local, national and international. Meanwhile, the Tadris Science Study Program at IAIN Kudus has a mission among other agencies and stakeholders to improve the quality of the academic community in the Tadris Science Study Program.

The madrasah service activity which is packaged under the name of the assisted madrasa is a new program initiated in the field of education. Community service activities are usually only through real work lecture activities and teacher professional training conducted by students. However, in madrasah, the assisted madrasah is carried out by all science teaching lecturers who are assisted by students. This activity aims to transfer knowledge from tertiary institutions through lecturers through assisted madrasah activities. The background to the importance of implementing assisted madrasas includes the development of increasingly advanced research methods and approaches, making it necessary for lecturers to transfer their new knowledge to teachers at school. In addition, lecturers can identify problems that exist in schools to be used as input for science learning in the future.

The development of 21st-century learning requires students to master various kinds of skills including the 4C. This causes that learning does not only master cognitive aspects but must master technology, knowledge, and social competencies which have now brought major changes in education. In this global era, human resources are needed who are skilled at managing and understanding large amounts of data and information in solving complex problems and thinking creatively with views and being open to new knowledge and information. Current curriculum development requires a package of skills that must be mastered by students so that students must be cognitively competent and have extensive experience. The current curriculum is prepared to meet the skills that must be possessed in the world of work. Several studies state that there are specific outcomes related to curriculum development following the needs of the world of work which can be integrated into learning models, assessments, strategies, or other activities. The education system is trying to change the adaptive curriculum to improve the quality of students and teachers through open

innovative learning according to 21st-century skills.

Along with the digitalization process, market opportunities for human resources have also changed, and competent people are needed. This relates to the learning context that must be taught to students who must be able to understand, transfer knowledge and integrate it into the external environment. (OECD, 2013) explains that literacy, problem-solving skills, information processing skills, communication, management, Science Technology Engineering, Mathematical (STEM) skills, and self-regulation skills in learning readiness are the highest skills to be prepared for in the world of work. Increasingly complex world problems require high-level skills such as critical thinking, decision-making accuracy, communication, and creative thinking to survive and adapt in an age of information-filled lifestyle society. So that the teacher in teaching does not only emphasize the learning process or talents in children but also current skills.

For this reason, it is very important for lecturers who not only teach inside or teach their students but also need to provide external dedication as a ceremony to see the education that is currently taking place, and equip students with new skills that can be obtained not only from teachers but from other people to add new experiences. With this, the assisted madrasah aims to train creative thinking skills through a practicum KIT at the Madrasah tadris IAIN IAIN Kudus at MTS Raden Umar Said Colo Dawe.

21st-century skills

Skill is the utilization of knowledge and solving problems that use the ability to think logically and innovatively, logically and intuitively as well as dexterity in using methods, tools, materials, and instruments in one field of learning or work. 21st-century skill is a modern movement that supports teachers, students, and the learning environment to adapt related skills that must be mastered per the competencies needed in the world of work. 21st-century skills are a set of skills needed by students to be ready to learn and innovate, survive, work, and be able to utilize. Teachers can train 21st-century skills by training students to understand the content, analyze, and reason. using high-level skills and collaborating skills can be used to solve a problem that is certainly not far from the talents of students.

The importance of 21st century skills

21st century skills are very important, so the curriculum must refer to the following (Ahmed et al., 2022) : 1) Teachers in teaching must contribute to solving problems that are around. 2) The curriculum must integrate and prepare for student engagement in the learning process and building knowledge and achievement at the academic level. 3) Provide space for students to be involved in various fields so that students allow the widest possible access to new information and are able to integrate their knowledge and experience as lifelong learning beings. 4) Prepare students to take a role in the development of ongoing learning in an innovative way and play an active role in the scientific and practical fields. 5) Teachers must be able to adapt to developing technology to prepare students to adapt to technological developments that are developing very fast. 6) Help students face the community effectively and positively to solve problems in an innovative and solutive way. 7) Helping students develop different competencies in navigating life to be successful in the world of work.

The Northern Territory central educational laboratory (NCREL 2003) classifies 21st-century skills into four criteria, namely 1) digital era skills (basic culture, scientific culture, economic culture, visual culture, and understanding cosmic culture. 2) thinking skills include the ability to adapt to managing information in an intact, self-management, curiosity, creativity and decision-making accuracy, high-level thinking and thinking clearly. 3) communication skills include cooperative skills, interpersonal skills, responsibility, solidarity, and interactive communication. 4). Skills to be productive include prioritizing planning skills, using technology effectively in the real world, communication skills, and collaborating in solving complex problems.

Creative thinking skills

To create so that students can think creatively, the teacher has an important role to train the ability to think creatively. Students will be able to think creatively teachers must be able to teach creatively.

Creative teaching describes the teacher's ability to invest all of his cognitive abilities, professional skills, and personality abilities to help students acquire knowledge and build knowledge in their way. Creative teaching will be an effective behavior for creating effective

learning through innovative strategies, methods, facilities, and activities to develop and train creative skills. Teaching creative thinking skills with creative teaching is one package. In training creative thinking skills, teachers should be able to bring learning outside the classroom, stimulate creativity, use theory that is technical/field in nature, and use modern creative assessment methods so that it is in line with higher-order thinking skills.

Procedurally, this study takes about 21st-century skills where the aspect to be observed and examined is about creative thinking with the indicators taken are 1) fluency thinking (fluency thinking) students can find an answer to the problem, 2) thinking flexibly (flexible) with indicators students can provide solutions from various angles, 3) think original (original thinking) indicators of this skill students can produce unique answers using their language or with words that are easy to understand, 4) the ability to elaborate (elaboration ability) an indicator of this skill is being able to develop an idea or describe in detail an answer.

Madrasah Program

Community service activities are a routine agenda that is carried out in addition to teaching and research lecturers. The PKM that is carried out is related to the form and role of carrying out the responsibilities of higher education institutions in the framework of participating in educating the life of the nation and as implementation and deimination to the community from various findings from research/studies conducted by tertiary institutions. Departing from this phenomenon, the tarbiyah faculty through the science education study program takes an important position and is a priority in learning and research activities. Community service activities are managed in the assisted madrasah program. The focus of the training is to develop a learning KIT entitled Microsain SKIT which is adapted to the local potential in Colo village, Dawe District, Kudus Regency. With the Microsains KIT to foster creative thinking skills in students.

Microsains KIT

It is a set of practicum kits that contain microgreens of spinach, and kale, measuring tools, plant pots, milk, sugar, bottles, scissors, etc. The Microsains KIT is arranged to start with the tools and materials needed to grow microgreens to harvest and complete with equipment for making ice cream. This material is included in physics material with the theme of temperature changes. So children are trained in creative skills in making ice cream, starting from planting plants until the plants are harvested and used to make ice cream. The MICROSAINSPracticum KIT is arranged in a box complete with tools and materials. The shape is minimalist and easy to carry anywhere during practice.

METHODS

Research Design

This study aims to determine the implementation of the madrasah program and measure students' creative thinking abilities through learning using the Microsains KIT. The type of research used in this research is field research, in which the main data source for answering the problem formulation is in the field, in other words, the problem formulation can only be answered if the data to be collected must be in the form of field data. The approach used in this research is quantitative. Quantitative research methods to answer the first problem formulation, and qualitative research methods to answer the problem formulation. The type of quantitative research used in this research is experimental research. This study uses a Quasi-Experimental research design with The Nonequivalent Control Group Design. This research was conducted on the control class and the experimental class using a pretest before the treatment was given and a posttest given after the treatment. In the experimental class, the treatment used was the microsains KIT, while in the control class the learning model used was Discovery Learning

Participant

This study consisted of two classes consisting of a control class and an experimental class with a total of 40 students in class VII consisting of VII A and VII B at MTs Raden Umar Said Colo, Dawe District, Kudus Regency.

RESULTS AND DISCUSSION

The implementation program for the assisted madrasas at MTS Raden Umar Said colo can be seen in a series of activities in Table 1.

Table 1. Activities for the implementation of the assisted madrasah program

Meeting 1	Meeting 2	Meeting 3	Meet 4	Meeting 5
Dissemination and explanation of the mechanism of the assisted madrasah program to the MTS, namely implementing the Microsains PRACTICUM KIT through coaching subject teachers in developing learning tools	Develop lesson plans, learning materials, and explanations regarding the use of the microsains KIT	Doing research with the theme of temperature changes. The teacher explains the initial material after that guides students to grow crops with the Microsains KIT according to the instructions in the student worksheet	Still in research, at this meeting students harvested plants that were planted in the next meeting and used these plants to make ice cream. After the ice cream finished, students presented their work.	Evaluate the activities of the assisted madrasah.

Based on Table 1. It is known that the implementation of the assisted madrasah lasted five meetings and began with the planning process which included outreach to teachers, preparing lesson plans, and determining learning method materials. While the implementation stage includes the first implementation, namely planting microgreens and the second implementation is making ice cream. The third or final stage is an evaluation where the achievement of the target madrasah program is following the initial plan.

Below are the results of the pre-test and post-test of the control and experimental classes. At the implementation stage, pre-test and post-test were carried out. The results can be seen in table 2.

Table 2. Pre-test and post-test results for the control and experimental classes.

No	Class	N	Score Ideal Score	Score Min	Max score	Average
1	Pre Test Experiment	20	100	34	65	52.85
	Post-test experiment			62	85	75.85
2	Pre Test Control	20	100	36	63	50.00
	Post Control Test			45	65	54.50

Based on table 2. It is known that in the experimental class there was an increase from the initial average of 52.85 to 75.85, this shows that students understand the material presented. For a clearer understanding, it is presented in Figure 1.

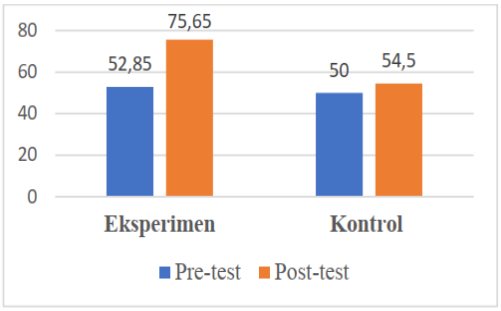

Figure 1. Pre-test and post-test results for the experimental and control classes

In Figure 1. There are differences in the pretest and posttest in the experimental class. While in the control group only slightly different. Pre-test and post-test questions were given to students in the experimental class and control class to see students' creative thinking abilities before and after the learning process. The Pre-test and Post-test questions are in the form of descriptions consisting of 7 questions, based on creative thinking indicators. The following is the presentation of the percentage of completeness of students' abilities on creative thinking indicators which are presented in table 3.

Table 3. Percentage Completeness Ability Participant educate on Indicator Think Creative

No	Indicator	Completeness presentation			
		Experiment Class		Control Class	
		Pre Test	Posttest	Pre Test	Posttest
1	Think lancar (*fluency*)	63	83	60	63
2	Think flexible (*flexibility*)	55	77	62	65
3	Think original (*originality*)	56	68	43	51
4	Skills detail (*elaboration*)	32	69	20	24
5	Think evaluate (*evaluate*)	55	75	54	59

Table 3. shows the completeness of students towards indicators of creative thinking. Each component experienced a significant increase. Meanwhile, it can be seen more clearly in Figure 2.

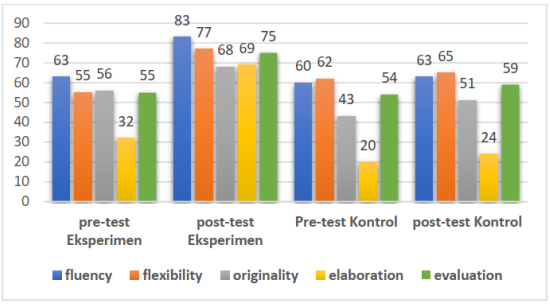

Figure 2. Bar Chart Completeness Indicator Ability Think Creative

Based on Figure 2. It is clear that of the five components that have experienced an increase is the detailing or collaborating skills indicator. Because in this practice cooperation between members is needed so that the process of planting and making ice cream runs smoothly. In the learning process in class, the activities of planting microgreens and making ice cream are carried out as described in table 4.

Madrasah Program

The first step to developing the success of a program is to develop a plan. Programming is part of the management process. Before implementing the program, it must develop an implementation plan which includes a clear formulation regarding the program objectives, and the tools used. It should have a clear planning formulation and include activities aimed at increasing the efficiency and results of the teaching and learning process. Planning is the process of deciding what goals to pursue in the future and what to do to achieve those goals. Planning for the assisted madrasah program has been finalized both in the tarbiyah faculties and the science tadris study program. The planning process starts with determining the material and determining the temperature change material. Material changes in temperature become the basis for determining the Practicum KIT that will be designed. The practicum KIT design process is carried out by students who have previously done it repeatedly to get the composition both in terms of tools and in terms of materials so that it can fit into a practicum KIT box. The planning of this practicum KIT also includes the composition of the materials used so that the amount and results obtained are following the results. In addition, trials were also conducted on the length of time the plants grew, and the length of the ice cream-making process, so that the learning process did not take a long time and ran effectively and efficiently.

The implementation of the assisted madrasah program is for lecturers and teachers where the teacher acts as a facilitator in teaching with lesson plans that have previously been prepared together. The teacher has a role as information is needed by students, the teacher designs the learning process, and the teacher becomes a motivator and guides students in solving problems. The teacher's role in directing students as a teaching facilitator has a significant effect where teachers often offer assistance to students, establish communication, and motivate students. In carrying out practicum the teacher must be able to manage both in terms of learning time and managing students, understanding students. The process of understanding students is very important because by understanding the ideology of students learning will run effectively and class management is under control (Kumar, 2021) .

Practical learning for class VII students is not easy, it requires extra skills by the teacher to control the learning process in class. Moreover, in the practicum process, students are very active and creative in conducting experiments. Many students are curious and actively ask questions and try to solve the problem in their way, so there are differences between the results between one group and another. The teacher in the learning process of the MicrosainsKIT practicum plays a role in creating education with themes that are relevant to students, namely farming and making ice cream, this is by the student's environment. By providing KIT practicum learning becomes enthusiastic, and passionate and students respond to it with critical and independent thinking. Based on the description of the teacher's role as the backbone of the education system, the teacher becomes an educational facilitator, innovator, and counselor.

Creative thinking

The ability to think creatively is one of the 21st-century competencies, which is an important aspect of learning. Through the creativity that students acquire at a young age, individuals can more easily solve problems in everyday life and be productive in adulthood. Creative thinking is a series of cognitive activities carried out by individuals using intelligence, imagination, ideas, and insight in dealing with solving a problem. In learning the microsains KIT, students are faced with the problem of how students can plant microgreens so that they grow. The problem of planting microgreens makes students think creatively. Think creatively and innovatively according to 21st-century skill competencies. In carrying out the practice of planting microgreens, some of the students failed and then took the initiative to plant more and the results were successful. The existence of a problem makes students gain new knowledge from failure to plant microgreens. The concept of thinking experienced by students is the result of thinking that builds creative thinking skills by acquiring new knowledge. In general, creative thinking is related to critical thinking and problem-solving. Creative thinking has three dimensions, namely synthesizing, articulation and imagination.

Fluency

The fluency indicator in the experimental class got 63% pre-test results and increased to 83% in the post-test, while the control class got 60% pre-test results and increased to 63% in the post-test. This means that in the experimental class the increase in fluency indicators was 20% higher than the control class by 3% with a difference of 17%. So that the increased score obtained shows that students are more able to think fluently by giving more relevant answers after going through the learning process. The use of the MICROSAINSPracticum KIT makes teachers have to manage good learning because the success of the learning process is determined by the learning objectives achieved. Farming practicum is something that is very close to a child's life if children are often trained in farming practicum, there will be fewer problems that hinder plant growth. Facing failure frequently will make individuals qualified so they can face problems in the real world. Fluent thinking skills are reflected in activities when students experience problems. Students convey to the teacher the problems experienced and communicate with their group mates. Fluent thinking skills are also reflected in the results of the pre-test and post-test, which increased by 20% in the experimental class and 3% in the control class. It can be said that problem-based learning can improve fluent thinking skills.

Flexibility

The flexible thinking indicator in the experimental class got 55% pre-test results and increased to 77% in the post-test, while in the control class the pre-test results were 62% and increased to 65% in the post-test. This means that in the experimental class the increase in indicators of flexible thinking (flexibility) was 22% higher than the control class by 3%, 19% adrift. So that the increased score obtained shows that students are more able to think flexibly to express ideas and solve the problems presented. In the process of observing plant growth and making ice cream a lot of student creativity emerged, from the process of observing students were able to identify, generate ideas, answer, and ask several questions that varied from observations so that students' ideas could be explored and creative thinking skills especially flexible thinking skills. Indicators of flexible thinking skills are generating varied questions, ideas, and answers, being able to see problems from different perspectives, looking for many alternatives, and being able to change different ways of thinking. Critical thinking skills can be trained using discovery learning, inquiry, and scientific approaches.

Originality

In the original thinking indicator (originality) in the experimental class, the pre-test results were 56% and increased in the post-test to 68%, while in the control class, the pre-test results were 43% and the post-test increased to 51%. This means that in the experimental class the increase in original thinking indicators (originality) was 12% higher than the control class by 8%, 4% adrift. So that the increase in score obtained shows that students can provide new, original ideas from a given problem. With the ability to think originally (Originality), students can provide various interpretations of an image and think of things that have never been thought of by other people. For example, students are given a picture of a problem, so from this problem students interpret the picture differently from the answers of other friends but the concept is the same.

Elaboration

On the elaboration skills indicator in the experimental class, the pre-test results were 32% and the post-test increased to 69%, while the control class obtained 20% pre-test results and the post-test increased to 24%. This means that in the experimental class the increase in elaboration skills indicators was 37% higher than the control class by 4%, 33% adrift.

The elaboration skills indicator has rapid increase because there is a presentation of waste processing skills which are only presented in the experimental class so that students can detail their thoughts in more detail in developing and expanding ideas to solve problems. Ability to detail (Elaboration), students can develop or enrich the ideas of others and arrange detailed steps. For example, students make questions related to making ice cream and farming, then from these questions students answer in their way, from these answers they are given explanations in the form of calculations and explanations in the form of other reasons that can strengthen the answers made by these students. Elaboration is the ability to explain the factors that influence and add details to the idea or idea so that it is more valuable.

Evaluation

On the Thinking indicator, the experimental class got 55% pre-test results and increased to 75% in the post-test, while the control class got 54% pre-test results and increased to 59% in the post-test. This means that in the experimental class the increase in the evaluation thinking indicator was 20% higher than the control class by 5%, with a difference of 15%. So that the increased score obtained shows that students can make decisions about situations to solve a problem.

In learning to think creatively, the benchmark is the ability to solve a problem at hand. This ability can be seen from several indicators, such as being able to identify problems, having curiosity, and being thorough and careful in working and evaluating decisions. Students are expected to have soft skills after receiving learning to think creatively. These soft skills refer to personality, quality, and individual behavior such as communication, problem-solving, self-motivation, decision-making, and time management abilities.

In learning the teacher holds full responsibility for the learning objectives to be achieved, so the teacher must develop creative learning plans to achieve the desired goals. The teacher's creativity in designing must also be supported by facilities and infrastructure from the school so as to provide convenience in planning lessons . The school principal provides an important role in addition to supporting the success of the learning objectives to be achieved as well as encouraging teachers to continue to innovate in developing learning models in accordance with the times. Learning with the aim of increasing student creativity must continue to be carried out repeatedly to respond to the child's creative soul so that the goals of learning objectives that want to achieve goals can be achieved. Learning by increasing student creativity has several weaknesses and advantages. The weakness is that not all students are at the same level of responsiveness as others when the teacher provides stimulation or sensory learning, besides that the teacher is able to map the focus of each student on the intended learning objectives. The advantage is that students are able to collaborate and work with their group mates to complete their assignments. The ideas that students put out are original and can be beyond the expectations of an expected goal.

CONCLUSION

Learning using the MicrosainsKIT affects the post-test results of the experimental class. The average post-test score for the experimental class was higher than that for the control class. The experimental class got an average score of 75.65,

while the control class got an average score of 54.50. The use of the Science practicum KIT affects students' creative thinking skills in five aspects including the fluency aspect at 63%, the aspect of flexible thinking at 65%, the aspect of original thinking (originality) at 51%, the aspect of detailing skills (elaboration) by 24%, and the thinking aspect of assessing (evaluation) by 59%. The increase in students' creative thinking skills in the experimental class was 0.48 which was in the medium category. This shows that students' creative thinking skills have improved quite well in the experimental class due to learning activities that apply to learning using the microsains Practicum KIT.

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