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Problem-Based Learning Model Integrated Islamic Values with Mind Mapping Assessment to Improve Students' Creative Thinking Skills

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abstract

The Indonesian education system requires developing 21st-century skills, including creative thinking skills (CTS). Students' CTS is still low. The study aims to describe student learning activities, analyze students' creative thinking skills, and describe student responses by applying a the problem-based learning (PBL) model that integrates Islamic values with mind-mapping assessments. The research method uses a true-experimental design with a posttest-only control design. The research location is at SMAN 1 Dukupuntang, and the respondents are 30 students. The sampling technique was random sampling, the population of all IPA students in class X. The selected classes were class X IPA 1 as the experimental class and X IPA 2 as the control class. Data collection research includes observation sheets, mind mapping, and questionnaires. Data processing techniques are in the form of normality tests, homogeneity tests, and hypothesis tests. The results showed that the average value of student learning activities is 88, classified as very good. Applying the PBL model that integrates Islamic values with mind mapping assessments can significantly improve students' CTS with scores of Asymp Sig. (2-tailed) 0.000. Student responses are positive with a response scale interest category (67,8). The findings in this study are that students need more stimulation to integrate Islamic values with science during online learning. It can be concluded that the PBL model, integrated with Islamic values and mind mapping assessment, can improve students' creative thinking skills.

1. Introduction

Along with the development of the times followed by the sophistication of science and technology, the education system is required to develop various skills that must be possessed in the life of the 21st century. According to the US-based Partnership for 21st Century Skills (P21), four skills need to be developed in the 21st century: communication, collaboration, critical thinking, and creativity (Istiningsih et al., 2019; Dilekçi & Karatay, 2023). The presentation shows that students must possess creative thinking skills, especially in this 21st-century life (Saeed & Ramdane, 2022).

Creative thinking skills (CTS) are the ability to generate new, constructive ideas or ways to produce a product based on rational and perceptual concepts, principles, and individual intuition (Wirdhana et al., 2019; Chen, 2021). Creative thinking skills (creative thinking) are built by

concepts embedded in students, and then the existing concepts and principles are applied in problem-solving efforts. Creative thinking includes consistent and continuous thinking to produce something creative (Hasanah et al., 2019; Nurkhin & Pramusinto, 2020).

Creative thinking skills make students active in learning, able to express opinions, and process information easily (Mamahit et al., 2020; Forte-Celaya et al., 2021). Creative thinking skills have become important for students to improve their problem-solving abilities (Hsia et al., 2021). The higher the creativity of students, the higher their ability to solve problems (Siagian et al., 2023; Ferdiani & Khabibah, 2022). In addition, the effort to stimulate the improvement of creative thinking skills is synergistic with the goal of the Ministry of National Education, namely, exploring student creativity, aiming to produce graduates who have abilities by graduate competency standards (Dewi et al., 2020).

The facts that occur in education show that students' creative thinking skills, especially in Indonesia, are still in the low category. This is based on the results of research conducted by Hans Jellen from the University of Utah, United States of America, and Klaus Urban from the University of Hannover, Germany, in 9 countries as research samples, successively creative thinking skills from the highest to the lowest countries, namely the Philippines, the United States, UK, Germany, India, China, Cameroon, Zulu and Indonesia. This means that the creativity of Indonesian children is still very low(Anita, 2017). As a result of these low creative thinking skills, the quality of students produced during the learning process has an underdeveloped analytical power. The knowledge he has is limited to mere abstract material. Creative people can see opportunities and turn weaknesses into strengths through continuous innovation(Anita, 2017).

There is a transformation in the process of implementing learning in schools. At first, learning was carried out offline (outside the network), and then transitioned to online learning (in the network), known as distance learning. This transformation of the learning process is a challenge that requires educators to be more technologically literate and able to think creatively in choosing an effective learning model when learning online. The implementation of subject matter in the learning-from-home process is not fully understood by students, especially by students who have less academic background. Many students feel confused in accepting the material presented by the teacher in online learning. In addition, the pattern of interaction between teachers and students is only one-way. Most teachers provide material, and then students are tasked with understanding the material and working on practice questions. So, online learning is considered ineffective (Prasetyaningtyas, 2020). This is supported by Praise (2020), which revealed that the weaknesses of online learning include students having difficulty understanding the material being taught without the teacher's explanation offline. This means that after the online learning process is complete, students still feel confused and do not understand deeply the learning material being taught.

This description of learning activities shows that educators as facilitators have not been able to optimally facilitate the needs of students in guiding the learning process. Unsurprisingly, without an educator's stimulus, students are not aroused and even lazy to analyze unique phenomena that occur in nature as one of the contextual learning processes. This condition makes students' creative thinking skills increasingly unhoned. Students' creative thinking skills need to be improved by providing facilities and opportunities for students to be directly involved in the learning process so that their creative thinking skills are expected to increase (Tumurun et al., 2016).

Another problem in science education today is the crisis in the context of religious values, especially Islam, which is integrated into science. This is due to the perception of the dichotomy of science. As a result, the dichotomy of science makes science and religion have real differences and cannot be combined. Such perspective makes one of the main factors causing students who

are printed during the learning process in the form of students who are rich in scientific intelligence but poor in spiritual intelligence. It is not surprising that today's students experience moral decadence, which is indicated by behaviors such as brawls, disrespect towards teachers, rude speech, promiscuity, and so on. A situation like this should be followed up by an educator so that the resulting student output has good ethics and understands that the essence of all knowledge has the same source, namely, God. So, in the learning process, it is very necessary to implement the integration between the content of science and Islamic values.

Based on this, the researcher offers a solution for selecting an effective learning model in the online learning process, namely the PBL model. This is by the theory that the application of the PBL model can increase students' activeness in online learning (Yunitasari & Hardini, 2021). The PBL model is a learning model that makes problems one of the main strategies in contextual learning that helps students develop thinking skills, problem-solving solving, and intellectual skills and can involve students in real or simulated experiences and become autonomous learners (Hasanah et al., 2019). This is synergistic in research, which concludes that problem-based learning can improve students' mastery of concepts and creative thinking skills (Raehan et al., 2020). In addition, the PBL model can improve critical and creative thinking skills (Ganesha & Learning, 2020).

So that in the implementation process, there are Islamic values, it is necessary to combine learning models with Islamic values. So that an integrated problem-based learning model of Islamic values is applied, integration itself has the meaning of unification, which means becoming a unified whole. By integrating Islamic values into the learning process, students are expected to have a balanced characteristic between scientific intelligence and religious values. Efforts to connect and integrate science and religion do not mean to confuse them. This is because the identity or character of each entity does not have to be removed; it must even be maintained.

The advantage of problem-based learning as a learning model is that it is a good technique to understand the lesson's content better. Challenging students' abilities and providing satisfaction to discover new knowledge for students. Increase student activity. Helping students learn how to transfer their knowledge to understand real-life problems. Through problem-solving, students can show that every subject (mathematics, science, history, etc.) is a way of thinking and something that students must understand, not just learning from the teacher or books (Wirdhana et al., 2019).

Mind mapping can improve creative thinking skills. The research results show that mind mapping can train students to construct biological concepts, connect between concepts and improve conceptual understanding (Astriani et al., 2020; Zubaidah et al., 2020). The number of tasks in online learning, but not followed by the development of optimal student understanding, makes researchers implement mind-mapping assessments. Mind mapping assessment is an assignment in the form of a thought map that connects one concept to another. Mind mapping is a visual technique that aligns the learning process with how the brain works naturally. Mind mapping uses the brain's natural way to combine writing, writing order, the relationship between words (left brain) and colors, images, dimensions, or spatial layout (right brain) (Basri & Syamsia, 2020; Ngan et al., 2021). The mind mapping assessment is one of the authentic assessments, and the implementation of the assessment is comprehensive in both the cognitive, affective, and psychomotor domains (ElSayary, 2021; Temiz & Sivrikaya, 2023).

Based on a review of the literature, it has been identified that there are previous studies that examine the integrated PBL learning model of Islamic values. According to Nabila (2020), the problem-based learning learning model integrated with Islamic values can improve mathematical critical thinking skills regarding self-efficacy. Then, on research by Simamora (2020), it was

concluded that problem-based learning in Physics using integrated teaching materials with spiritual values could improve student learning outcomes regarding initial abilities. Harahap and Darmana (2020) revealed that learning Chemistry using the PBL learning model with integrated spiritual values teaching materials can improve learning outcomes and spiritual attitudes. However, no identified research still examines the application of problem-based learning models integrated with Islamic values with mind mapping assessments to improve students' creative thinking skills in online and offline learning. So, it is necessary to do further research on applying problem-based learning models integrated with Islamic values with mind mapping assessments to improve students' creative thinking skills. This study aims to describe student activities by applying an integrated PBL model of Islamic values with a mind-mapping assessment.

2. Method

The research method used is a quantitative method with a proper experimental design. The type of true experimental design applied is a posttest-only control design. In this design, the sample is taken randomly based on a specific population, and posttest is carried out after being given treatment to measure the effect of treatment in the study (Sugiyono, 2015). The population in this study were all students of class X SMAN 1 Dukuntang majoring in science for the academic year 2021/2022. The samples used were X IPA 1 as the experimental class, which applied the PBL model integrated of Islamic values, and X IPA 2 as the control class, which used the conventional learning model. The research instruments used were observation sheets, mind maps, and questionnaires. The creative thinking skills analysis technique uses normality tests, homogeneity tests, and hypothesis testing. The following is the CTS assessment rubric used shown in Table 1.

Table 1. Mind map assessment rubric

CTS Indicators	Assessment Aspect	Score
Fluency	Mind map showing very complex material more than 4 branches	25
	Mind map showing complex material as much as 4 branches	20
	The mind map shows quite complex material as much as 3 branches	15
	Mind map showing less complex material as much as 2 branches	10
	Mind map showing 1 branch of uncomplex material	5
Flexibility	Using color to show the relationship of all topics is very good	25
	Using color to show the relationship between topics is good	20
	Using color to show a pretty good relationship	15
	Using color to show the relationship between topics is not good	10
	Using only one color to show the relationship between topics	5
Originality	Able to express ideas in the form of creative renewal which is very interesting	25
	Able to express ideas in the form of interesting creative renewal	20
	Able to express ideas in the form of creative renewal which is quite interesting	15
	Able to express ideas in the form of creative renewal that is less attractive	10
	Able to express ideas in the form of creative renewal that is not interesting	5
Elabaration	Idea(material) in the form of very effective keywords	25
	Idea (material) in the form of effective keywords	20
	Ideas (materials) in the form of keywords that are quite effective	15
	Idea (material) in the form of limited keywords	10
	Idea (material) in the form of keywords does not exist	5

Modification of Suratmi and Novianti (2013)

3. Result and Discussion

Learning Activities in the Application of the Integrated Problem-Based Learning Model of Islamic Values

The following is a diagram of the percentage of student learning activities that are applied to the PBL model integrated with Islamic values, as shown in Figure 1.

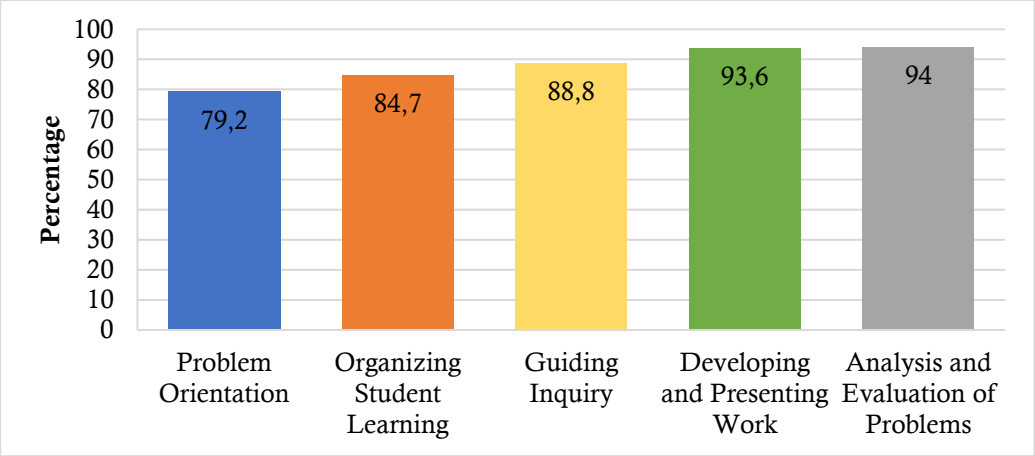

Figure 1. Diagram of the percentage of student learning activities that are applied PBL model integrated Islamic value

Based on the observation data from the observation sheet contained in the diagram above, it can be seen that there are differences in student learning activities at each step (syntax) of integrated PBL learning of Islamic values. It is known that in the first learning phase (student orientation to problems) the percentage of student learning activities is 79.2, while in the second learning phase (organizing student learning) the percentage is 84.7. In the third phase (guiding investigations individually or in groups) the percentage of student learning activities was obtained at 88.8. Furthermore, in the fourth learning phase (data development and presentation) student learning activities were obtained worth 93.6 and in the last learning phase (problem analysis and evaluation) student learning activities achieved a value of 94.

Observation of students' online learning activities in this study was carried out by forming large and small classes, which were observed using an observation sheet on each learning syntax. A large class is a primary class used to conduct thorough discussions with the teacher and between groups. It consists of 35 students, according to the number of students in the class. At the same time, the small class is a secondary class used to conduct discussions with the teacher and between group members. It consists of 6 students, according to the group randomly divided by the teacher. Forming small groups in learning can produce a higher-quality discussion (Caroni & Nikoulina, 2021).

The observation sheet data analysis shows that the first learning phase (problem orientation) has the lowest average value of student learning activities among other learning phases. This can happen because students are still adapting to the learning model applied by the teacher. Then, the average value of the student's learning activities continued to increase until the fifth learning phase without any decrease. This increase in learning activities is to the literature, which reveals that the PBL learning model can encourage the development of teamwork skills and social skills because it is carried out in small groups (Amir, 2010). Through the development of these skills, students' learning activities can increase. In addition, integrating Islamic values can increase

students' learning motivation (Lutfianto & Sari, 2017). So that student learning activities continue to increase when the integrated PBL learning model of Islamic values is applied.

The impact of the increase in learning activities is increasing students' understanding of the material being taught. This is because students are directly involved in the learning process. This is in accordance with the opinion of Slameto (2010), which revealed that the learning activities of directly involved students gave the impression of a meaningful learning process. The impression will not just disappear but is thought about, processed, and then issued in a different output. So that the concept of the subject matter is not easily forgotten.

Based on the explanation above, it can be understood that the PBL learning model integrated with Islamic values can train group work and social skills and make students more actively involved directly in the learning process. As a result of the learning process, it makes the student's learning experience more meaningful. So, it can be concluded that the PBL learning model integrated with Islamic values can increase student learning activities with an average value of 88 student learning activities, which are categorized as very good.

Creative Thinking Skills Students Through Application of Integrated Islamic Values PBL Model with Mind Mapping Assessment

Based on the learning outcomes between the experimental and control classes, the students' creative thinking skills were obtained as shown in Figure 2.

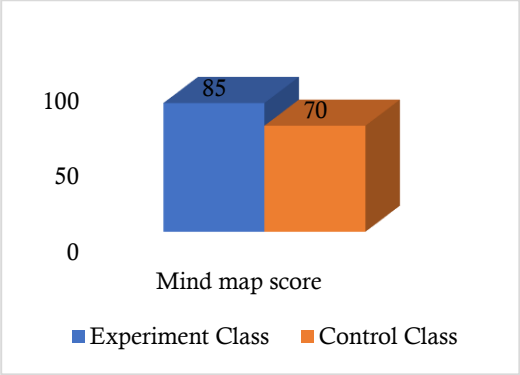

Figure 2. Average diagram of students' creative thinking skills

Based on Figure 2 regarding the average CTS of students, it can be understood that there is a difference in the average CTS of the experimental and control classes. It is known that the average CTS for the experimental class is 85 while the average CTS for the control class is 70. The average value for the CTS shows that the creative thinking skill level of the experimental class students is higher than that of the control class. This is motivated by the difference in treatment between the experimental and control classes during the learning process. So based on these factors, the output of learning outcomes in the form of the level of students' creative thinking skills between the experimental class and the control class can also experience differences. Based on the acquisition of these values, the results of hypothesis testing are obtained in Table 2.

Table 2. Hypotesis test

Data	Hypothesis Test	Description
CTS	0.000	H_0 Rejected, H_a Accepted

The results of the data analysis showed the CTS scores of experimental and control class students in Asymp. Sig. (2-tailed) obtained 0.000. This value <0.05 so Ha is accepted and H0 is rejected. It can be concluded that there are significant differences in creative thinking skills when applying the integrated PBL model of Islamic values with mind mapping assessments.

Based on the results of the study, it was shown that the experimental class that applied the PBL learning model integrated with Islamic values , with mind mapping assessments, had a high average CTS value compared to the average creative thinking skills value of the control class that applied the conventional learning model with a mind mapping assessment. The average value of the creative thinking skills for the experimental class is 85. Then, the average value for the creative thinking skills for the control class is 70.

Based on the acquisition data above, it can be understood that the creative thinking skills of the experimental class students are higher than those of the control class. Applying the PBL model that integrates Islamic values with a mind-mapping assessment can improve students' creative thinking skills. This is by the theory, which reveals that one of the advantages of the PBL model is that it is effective in understanding lesson content (Nabila, 2020). In addition, integrating Islamic values into the learning process also increases students' understanding of the lesson concept. Integrating Islamic values in learning can increase the understanding of concepts more meaningfully and enable the development of skills to find, process, and utilize information. It is also supported by the results of other studies, which reveal significant differences in student learning outcomes in classes that use spiritual values-integrated teaching materials with classes that do not use spiritual values-integrated teaching materials (Okimasari et al., 2016). So, the acquisition of the value of creative thinking skills of experimental class students who applied the Islamic value integrated PBL model had an average value of creative thinking skills superior to the control class.

Based on statistical data analysis regarding the hypothesis testing of students' creative thinking skills, the Asymp Sig value was obtained. (2-tailed) of 0.000. This value is < 0.05, so Ha is accepted, and H0 is rejected. This means that the researcher's hypothesis is accepted; there are significant differences in students' creative thinking skills when applying the integrated PBL model of Islamic values with mind mapping assessments. This is under the literature, revealing that PBL learning with Islamic values is better than conventional learning models (Putra et al., 2021). This is supported by another theory that reveals significant differences in student learning outcomes in classes that use spiritual values-integrated teaching materials with classes that do not use spiritual values-integrated teaching materials (Okimasari et al., 2016). PBL learning with Islamic values is better than conventional learning models (Putra et al., 2021).

Student Responses to the Integrated Problem-Based Learning Model of Islamic Values

The results of students' responses to the integrated PBL learning model of Islamic values are shown in Figure 3.

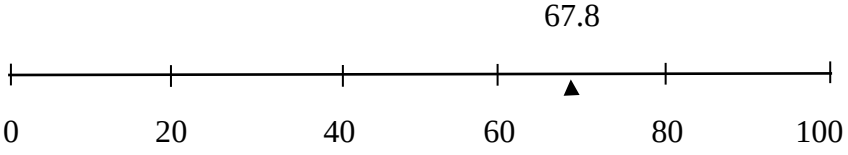

Figure 3. A diagram of average student responses in general

The average score of student responses in general to the PBL model integrated with Islamic values with mind mapping assessment is 67.8. If interpreted based on the questionnaire rating scale range, it is categorized in the criteria of interest. So, it can be concluded that applying the PBL model that integrates Islamic values with mind mapping assessments to improve students' creative thinking skills is generally well received by students, with positive responses in the interested category.

Student responses in the study were obtained based on the results of the analysis of the questionnaire instrument, which was adjusted to the research indicators. This questionnaire was only distributed to the experimental class. This is because only in the experimental class was the application of the integrated PBL model of Islamic values carried out. Thus, respondents who need to be given a questionnaire are the only respondents who receive virus subject matter with a PBL model that integrates Islamic values with a mind mapping assessment.

Based on the results of data analysis in Figure 3 regarding student responses in general to the integrated PBL model of Islamic values, the response results are 67.8. This value indicates that the student's response to applying the integrated PBL model of Islamic values with a mind mapping assessment can be accepted with a positive response in the interested category. This is also supported by the results of the analysis of the percentage of each student's response to the integrated PBL model of Islamic values with a mind mapping assessment, which also obtained a positive response in the category of moderately interested (27%) and the interested category (73%). So, it can be concluded that applying the integrated PBL model of Islamic values with a mind mapping assessment received a positive response from students in the interested category.

This data is one of the accurate references that grade X students of SMAN 1 Dukupuntang responded positively to the learning process related to implementing the PBL model integrated with Islamic values , with mind mapping assessments carried out by the teacher. This positive response shows that students are comfortable and happy when the PBL model is integrated with Islamic values, with mind mapping assessments when learning online. Therefore, applying the PBL model that incorporates Islamic values with a mind mapping assessment is feasible to use in the teaching and learning process, adapted to the material and learning objectives (Sari et al., 2019). Then, it was also strengthened in the study, which concluded that the average positive student response to applying the PBL model to improve problem-solving abilities reached 76.32% (Sari, 2021).

4. Conclusion

Student learning activities during the learning process have increased with an average of 88.1, which is included in the outstanding category. The creative thinking skills of the experimental class students (85) were higher than those of the control class (70). The results of the hypothesis test show the Asymp value. Sig. (2-tailed) $0.000 < 0.05$. So, H_a is accepted and H_0 is rejected, or there is a significant difference in students' CTS through applying the PBL model that integrates Islamic values with a mind mapping assessment. Positive student responses reached an average of 67.8 responses categorized as interested. Applying the PBL model integrated with Islamic values , with a mind mapping assessment, proved well received by the respondents.

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