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Integrated Cooperative Learning Model of Local Wisdom Values on Mastery of Science Concepts

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Abstract: Learning models are guidelines for educators in planning classroom learning, starting from preparing tools, media and learning instruments, to assessment tools that lead to efforts to achieve learning objectives. This study aims to test the effect of implementing integrated cooperative learning media with local wisdom values on the mastery of science concepts at SMPN 2 Telaga Biru. The research design used is a One-Shot Case Study Design, and this study uses two classes as samples. The data analysis techniques used are the normality test and the hypothesis test. Cognitive learning outcomes through hypothesis testing criteria, where the experimental class has a t-count value of 11.19, and the replication class has a t-count value of 15.36. While the t-table value in the experimental class and replication class is 2.07. From the results of data testing, the t-count value ≥ t-table with a level of $\propto = 0.05$ for the two classes, it can be concluded that H_0 is rejected and $_{H1}$ is accepted. The results of the study showed a significant increase in concept mastery after the implementation of the cooperative learning model. The implementation of the cooperative learning model can change the pattern of student interaction for the better because it contains steps and designs. Data analysis showed that the average posttest score was higher than the KKTP score. This study concludes that the implementation of the cooperative learning model can be an effective alternative to improve mastery of science concepts.

Keywords: Cooperative Learning Model; Local wisdom; Science Concept.

Introduction

Education is a conscious and planned effort to create an atmosphere and learning process so that students actively develop their potential to have spiritual, religious strength, self-control, personality, intelligence, noble morals, and skills needed for themselves and society. Education is expected to produce the next generation of the nation with intelligent and qualified individuals, which means the generation is able to utilize existing progress [1]. Education is a process of acculturation, namely the instillation of values and norms in the order of national and state life, making humans into beings with noble character, noble morals, and culture.

Local wisdom, as a cultural wealth of a region, has moral values and knowledge and is a source of contextual knowledge. These values emerge from society in various forms, such as customary rules, which are unwritten rules and are still respected [2]. Local wisdom is a view of life and knowledge, as well as various life strategies that are manifested in activities carried out by local communities to respond to various problems and meet their needs [3].

Huyula in Gorontalo society can be seen in several types [4], namely: (1) *Ambu* is an activity of helping each other for the common good or better known as community service, Ambu is also one of the methods used by society to resolve problems that exist in society such as: quarrels between residents, differences of opinion, (2) *Hileiya* is an activity of spontaneous helping which is considered an obligation as a member of society, (3) *ti,ayo* is an activity of mutual cooperation between groups of people to do someone's work.

The concept of local wisdom learning is to connect learning with local/regional wealth in the form of knowledge, beliefs, norms, customs, culture, insights, and so on, which are ancestral heritage and are maintained as identity and guidelines to teach us how to act appropriately in life. Therefore, teachers must be creative and innovative in creating learning that instils cultural values in students. One of them is choosing a learning model that can help students integrate local wisdom into learning.

The learning model is a guideline for educators in planning classroom learning, starting from preparing tools, media and learning instruments, to assessment tools that lead to efforts to achieve learning objectives [5]. The definition above is in line with Isrok'atun's opinion [6] A learning model is a structured learning plan which describes the stages of learning sequentially to support students in developing understanding, concepts, and thinking skills to achieve learning objectives. In this study, the learning model used is the cooperative learning model, Think-Pair-Share (TPS).

This cooperative model has many types, one of which is the Think-Pair-Share type. Think Pair Share (TPS) is a type of cooperative learning designed to influence student interaction patterns [7]. Introduced by Frang Lyman and colleagues at the University of Maryland in 1981, with the idea of waiting time or thinking, TPS is an effective way to

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vary the atmosphere of class discussion patterns. Think Pair Share (TPS) learning invites students to play an active role in learning where individual thinking processes occur (Think), then continued with a discussion stage with a partner after previously thinking individually (Pair), and finally sharing the results of the discussion learning with their classmates (Share) [8].

The implementation of the TPS, the cooperative learning model, helps students get used to asking questions to the teacher, dare to express their opinions, and work well together [9]. The Think Pair Share model is a type of cooperative learning that can create affective and enjoyable learning, reduce boredom, provide motivation, and improve learning outcomes [10]. Think Pair Share (TPS) learning invites students to play an active role in learning where the individual thinking process occurs (Think), then continues with a discussion stage with a partner after previously thinking individually (Pair), and finally sharing the results of the discussion with classmates (Share) [11].

The advantages and disadvantages of the Think Pair Share (TPS) cooperative learning model are as follows [12]: (1) The advantages of the Think Pair Share learning model include: (a) allowing students to work alone and collaborate with others; (b) being able to maximise student participation. (2) Disadvantages of the model Learning Think Pair Share include: (a) many groups reporting discussion topics; (b) ideas generated are limited.

The existence of a learning model can help learning run smoothly, for example, in science learning. Learning can be interpreted as a product of continuous interaction between development and life experience. In a more complex sense, learning is essentially a conscious effort by teachers to teach students (directing student interaction with other learning resources) in order to achieve the expected goals [13]. The science learning process is oriented towards application skills, developing thinking skills, curiosity, caring and responsible attitudes towards the social and natural environment. Science also aims to display the surrounding biological and natural environment, as well as the various advantages of the archipelago.

Learning can run smoothly because of the learning model. The learning model not only functions to change student behavior as expected, but also functions to develop and improve various aspects of skills related to the learning process, one of which is student learning outcomes. The results achieved by students can be skills, both related to aspects of knowledge, attitudes, and skills that students have after receiving learning experiences [14].

Asep and Haris [15]explain the importance of the results learning. They explain that learning outcomes are everything that belongs to students as a result of the learning activities they do. The learning objectives in this section are a set of learning outcomes that students have achieved through the implementation of learning actions, which generally include new knowledge, skills, and attitudes which students are expected to obtain. Bloom [16] divides learning outcomes into three domains, namely: 1) Cognitive domain, related to intellectual learning outcomes, 2) Affective domain, related to attitudes, and 3) Psychomotor domain, related to skills and abilities to act.

A good learning model will make learning conducive and can affect student learning outcomes, especially in mastering science concepts. Mastery of concepts and principles in science learning is important for the development of students' skills and cognitive aspects. Mastery of concepts is very important in the learning process because with mastery of concepts, students are able to develop their skills in every learning [17].

Based on the description of the problem above, regarding learning models and concept mastery, the researcher wants to know the influence of implementing the cooperative learning model on the mastery of science concepts at SMPN 2 Telaga Biru. This research is expected to be an alternative to science learning in improving student learning outcomes.

Research methods

This type of research is quantitative research with a pre-experimental research design. The research design used is a one-shot case Study Design. This research was conducted in class VIII at SMPN 2 Telaga Biru in the 2024/2025 academic year. The sampling technique in this study was the total sampling technique. The sample used in this study was students of class VIII 1 and VIII 2 of SMPN 2 Telaga Biru, totalling 23 students. The instrument used in this study was the learning outcome test, a measuring tool used to determine the achievement of student learning outcomes. The test instrument is in the form of an objective test of 15 questions and an essay of 5 questions given after the learning is completed (Post-test). The data analysis technique used in this study is the normality test and the hypothesis test. The data normality test is carried out to determine whether the research data is normally distributed or not. [14].

Results and Discussion

The results of the analysis of the knowledge learning outcome test (cognitive) using an assessment sheet in the form of a posttest learning outcome test. Based on the overall posttest results, the average posttest score in the experimental class was 87.21 and in the replication class was 89.39. The test was compiled based on question indicators that were adjusted to the learning indicators, totalling 15 objective questions and 5 essay questions. The level of the test consists of 4 levels, namely level C1 (Knowledge), C2 (Understanding), C3 (Applying), and C4 (Analysing).

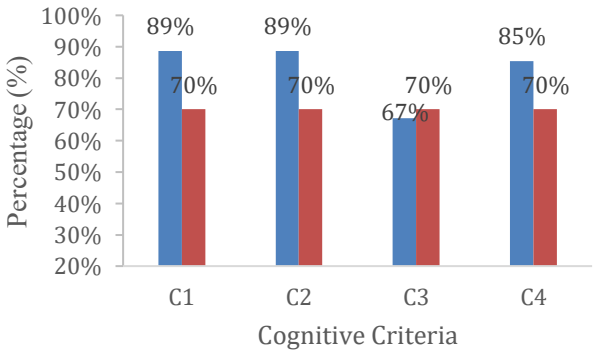

Figure 1. Cognitive Criteria Analysis Diagram of Experimental Class

Based on Figure 1, the cognitive achievement of the experimental class shows that the cognitive criteria C1 to C4

obtained KTTP values lower than the percentage results, except for cognitive C3. With an average percentage at cognitive level C1 of 89, cognitive level C2 of 89%, cognitive level C3 of 67% and cognitive level C4 of 85%.

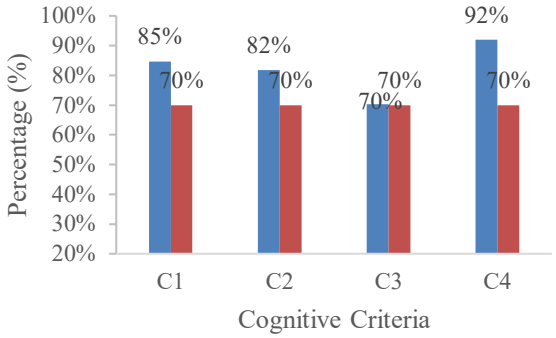

Figure 2. Cognitive Criteria Analysis Diagram of Replication Class Posttest

In Figure 2. shows the overall cognitive achievement of the replication class that cognitive criteria C1 to C4 obtained the percentage of cognitive criteria C1 to C4 *posttest* with an average percentage at cognitive level C1 of 85%, cognitive level C2 of 82%, cognitive level C3 of 70% and at cognitive level C4 of 92%. Furthermore, the cognitive criteria result sheet was tested using a normality test. After it is known that the data is normally distributed, the hypothesis testing is then carried out.

Based on the data from the students' cognitive learning outcomes above, it is known that in the experimental class, the highest value is in cognitive achievement C1 of 89% and the lowest is in cognitive achievement C3 of 67%. While in the replication class, the highest value is in cognitive achievement C4 of 92% and the lowest is in cognitive achievement C3 of 70%. This happens because in cognitive achievement C3, the questions given are about calculations, so many students find it difficult to answer questions from cognitive achievement C3. This is in line with Hijriani's opinion [18], the factor causing the difficulties experienced by students in calculation questions is that students cannot write the correct formula, and cannot carry out the calculation process properly. correct and gradual. This happens because students forget which equation they used, and many students are not careful in working on the questions, so mistakes occur. and errors in carrying out calculations, and one of the causes of students' difficulties in learning physics is due to mathematical difficulties. And the highest scores on cognitive achievement C1 and C4 are because students are directed to analyse and explain the material, so that a deeper understanding of the material is needed.

The results of the cognitive achievements of the experimental class and the replication class are not much different because both classes receive the same treatment, both the replication class and the experimental class, and both measure learning outcomes. This is in line with the opinion [19], cognitive learning outcomes between replication classes and experimental classes are often not much different because the learning process in both classes is designed very similarly**.** The goal is to re-test whether the learning method or teaching method tried in the experimental class really does provide the expected results. If the method is effective, then when repeated exactly in the replication class, the increase in students' thinking and understanding abilities (cognitive) also tends to be similar**.** In addition, researchers usually try to ensure that the initial abilities of students in both classes are not too different**,** so that learning outcomes can be fairly compared. Finally**,** the method of measuring learning outcomes (for example, with tests) is also made the same in both classes. That way, if the learning outcomes in the replication class are similar to those in the experimental class, we are more confident that the learning method tried is indeed effective and not just a coincidence. From the results above, it is known that the average *posttest* score obtained is higher than the KTTP score. The data obtained were then analyzed by including two tests, namely the normality test and the hypothesis test.

Data Normality Test

A data normality test is conducted to determine whether the research data is normally distributed or not. In this study, the researcher used the statistical method used for this normality test is the Kolmogorov Smirnov test. This normality test is carried out on the data from the class, namely the experimental class and the replication class, which received the same treatment using the cooperative model in learning. The results of the data normality test can be seen in Table 1.

Table 1. Results of Cognitive Learning Outcome Data Normality Testing

Class	Fi	K	Status
Experiment	0.47	0.28	Normally Distributed
Replication	1.00	0.28	Normally Distributed

Based on Table 1, the results of the normality test of cognitive learning outcome data, it is known that $F_i \geq K$ for the real level $\alpha = 0.05$. This shows that the research result data for the experimental class, replication normally distributed.

Hypothesis Test

This hypothesis testing aims to determine the picture of the learning outcomes of class VIII students at SMPN 2 Telaga Biru before the implementation of the local wisdom integrated cooperative learning model and after the implementation of the local wisdom integrated cooperative learning model. To test this hypothesis, the one-sample t-test is used.

Table 2. Results of Cognitive Hypothesis Testing

Class	t-count	t-table	Status
Experiment	8.86	2.07	H_1 Accepted
Replication	15.36	2.07	H_1 Accepted

Based on Table 2, the calculated t-count is obtained > t-table, with a confidence level of α=0.05 for the experimental class t count of 8.86 and for the replication class t count of 15.36, then H0 is rejected and H1 is accepted. From the hypothesis testing, it is concluded that the cognitive learning outcomes of students using learning with a cooperative model integrated with local wisdom values experience differences with the KTTP value.

The local wisdom referred to in this study is the *Huyula* culture*,* which is a local wisdom owned by the Gorontalo community and is still used today. According to Koem [20]*Huyula* is a system of mutual cooperation or mutual assistance between community members to meet common needs and interests based on social solidarity. This is reflected in activities carried out together by all members of the community, such as family activities or agricultural activities. In this study, the cultural values *of Huyula* itself are used in the learning process. The *Huyula* values referred to in this study are the first is *Ambu,* which means group work that is done together, for example in doing group assignments given by the teacher; second is *Hileiya*, which is individual work that is done together, for example when a friend experiences a disaster and we help him voluntarily; and the last is *Ti'ayo,* which is the value of empathy possessed by each student, for example students raise funds to help others.

Huyula values in this study can be seen in students when collecting results according to the specified time and entering the classroom on time before learning begins (discipline), not copying friends' work and not relying on friends when completing assignments (independent), not being arbitrary with group members (fair), listening to friends' opinions and accepting the results of discussions during discussions (deliberation), respecting teachers who are teaching and lending stationery to friends (empathy). Huyula culture is very important for the world of education because the impact it has on students is very positive, including mutual cooperation and good cooperation. This study is in line with Worang's opinion. *Huyula* values in general are values that contain the meaning of mutual cooperation in all aspects of community life, both in joy, sorrow and in relation to other aspects of Gorontalo community life [21]. In learning, students can help each other. The concept of huyula will intersect with the values brought in cooperative learning, where students work together to achieve common learning goals.

The cultural values *of Huyula,* namely the habit of mutual cooperation and helping each other in Gorontalo society, are very suitable to be applied in the *Think-Pair-Share (TPS) group learning method. In the TPS model*, students first think for themselves, then discuss with classmates, and finally convey their ideas to the whole class. This method is almost the same as *Huyula,* namely everyone contributes and works together to achieve common goals. Therefore, the values of togetherness and helping each other typical of Huyula can be applied in schools through this TPS learning model, namely students learn together and help each other to understand the lesson. This process not only helps students understand the material better, but also trains social skills such as respecting other people's opinions and working in a team. Therefore, TPS is suitable for use as a learning model for subjects that require a lot of social interaction and collaboration, for example science.

In addition to being able to improve the ability to work together, the Think Pair Share (TPS) learning model is also considered capable of improving learning outcomes because students learn with a more interesting approach thanks to an innovation in learning [22]. The Think Pair and Share (TPS) cooperative learning model focuses on class discussion activities [23]. TPS has clear procedures to give students time to think, provide answers, and interact with each other, helping each other. Through this model, it is expected that students can work together, need each other, and depend on each other in small groups cooperatively. With Think Pair Share (TPS), students learn actively by exchanging ideas with members of their groups. This can increase students' self-esteem, and students also have the opportunity to participate in class discussions and answer the teacher's questions because they have considered the answers, unlike usual learning, where only some students are active.

Based on the discussion above, it can be concluded that the application of the cooperative learning model to students' mastery of science concepts at SMPN 2 Telaga Biru is proven by the posttest score being higher than the KKTP score.

Conclusion

Based on the results of the study, it can be concluded that there is a significant influence when the integrated cooperative learning model of local wisdom is applied to the mastery of science concepts in class VIII of SMPN 2 Telaga Biru. This is indicated by the results of cognitive learning through the hypothesis testing criteria where t-count ≥ t-table with a level of α=0.05 for the experimental and replication classes; therefore, H0 is rejected, and H1 is accepted. So, it can be concluded that there is an influence of the application of the local wisdom integrated cooperative learning model on the mastery of science concepts.

Author Contributions

Delsi Ripo: Conceptualization, Drafting of Original Paper, Methodology; Masra Latjompoh: Methodology; Abdul Haris Odja: Curation, Writing-original drafting; Ritin Uloli: Writing–review and editing; Citron S. Payu: Formal Analysis, Methodology; I Made Hermanto: Validation.

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