The Effect of Problem Based Learning (PBL) Based on Local Wisdom in Making Lemang *Kancung Beruk* on Students' Critical Thinking Skills

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Abstract: This study aims to determine how the effect of local wisdom- based PBL model on making Lemang *Kancung Beruk* on critical thinking skills. The research method is a quasi-experimental form of non-equivalent pretest-posttest control group design with purposive sampling technique. The research population was Phase D of SMP Negeri 6 Sungai Penuh, the research sample was class VII A and VII B with a total of 36 students, 18 students each from class VII A as the experimental class and class VII B as the control class. Data collection techniques used FRISCO indicator critical thinking ability essay tests and observation sheets. Data analysis technique used one-way Ancova test with initial critical thinking ability as covariate. The results showed that the average value of the experimental class posttest results was higher at 88.19 than the control class 70.60. The hypothesis test results obtained the value [$F_{(1.33)} = 49.515$, $p < 0.001$, $\eta p2 = 0.600$] showing the significance of $p < 0.001$ which means < 0.05, meaning that there is an effect of the local wisdom-based PBL model on making Lemang *Kancung Beruk* with an effect size value of $\eta p2 = 0.600$ has a large effect.

Keywords: Critical thinking skill; Local wisdom; Problem based learning

Introduction

The quality of education is determined by the existence of the curriculum used. Curriculum changes are always changing during this time, it is intended that students are able to adapt to changing times. The problem that occurs among students is that many students do not fully understand the curriculum that is being used but in a relatively fast time must adapt again to the new curriculum. This makes students do not have sufficient opportunities to optimize the potential that should be developed.

The progress in the field of education can be seen from the government's efforts in improving the curriculum. The independent curriculum is present to prepare students in the era of global human resource competition. This is in line with Kepmendikbudristek Number 56 of 2022 concerning guidelines for implementing the curriculum in the context of restoring learning with an independent curriculum as the realization of the new curriculum. The latest essence of the independent curriculum refers to project-based learning and case method with local content-based learning resources (Fahrozy et al., 2022).

Many competencies are required to be mastered in 21st century learning. The competencies that need to be mastered are 4C, which are critical thinking, collaboration, communication, and creativity (Trilling & Fadel, 2012). In fact, in the field, the skills of 4C have not been optimized, the impact of non-optimal 4C skills can cause students to be less able to master the material. One of the most visible of the 4C skills in everyday life that has not been optimized is critical thinking skills. Critical thinking is needed to train students' thinking skills. If students' critical thinking skills are not empowered, students have difficulty solving problems in everyday life. Therefore, it is necessary to train critical thinking

skills, especially those related to local content so that they can solve real-life problems (Hadi et al., 2019b).

Based on the results of observations of researchers at SMP Negeri 6 Sungai Penuh, 4C skills, especially critical thinking, are still not optimal. This can be seen when given a problem to students, students have not been able to fully focus, have not been able to provide reasons, inference, understand the situation, explain conclusion and overview. This is what affects student scores which are classified as low. The impact is that students cannot achieve the minimum completeness criteria in a lesson. The facts in the field are also evidenced by the results of teacher interviews stating that teachers experience obstacles in learning science, especially substance material and its changes, because the material is still abstract even though the material and the process of changing substances are often applied in everyday life such as in making Lemang *Kancung Beruk*. Therefore, this learning can also be done through local content-based problem solving.

One of the strategies that can be done to train critical thinking skills is by familiarizing students to solve problems. The problem-based learning (PBL) model can be used as an alternative to train students' critical thinking skills. This is supported by research of Astuti (2019), that the learning model that can improve critical thinking skills is the PBL model. As for local content so that learning material is more contextualized, changing abstract material to be more real can be used based on local wisdom. This is in line with research of Avitrananda et al. (2020), which states that the implementation of PBL based on local wisdom can improve critical thinking skills, because students have prior knowledge about the local wisdom of the area, so that students become active in the learning process and students can think critically.

Previous research only examined the effect of problem-based learning on critical thinking skills (Anto et al., 2022). Meanwhile, there are still few who examine PBL models based on local wisdom, and no one has examined the local wisdom of the Kerinci-Sungai Penuh Region, namely Lemang *Kancung Beruk* to be integrated in science learning. Especially the science material of substances and their changes. For this reason, researchers feel the need to prove whether the same PBL model based on local wisdom applies or even further improves students' critical thinking skills.

The local wisdom taken in this research is the making of Lemang *Kancung Beruk*, which is wrapped using a semar bag (*Nepenthes* sp.) which is served at the kenduri sko traditional event (Mutiara & Fridayati, 2022). Lemang *Kancung Beruk* is the local wisdom of the Kerinci region which is a specialty of the Lempur area from glutinous rice wrapped in a semar bag (*Nepenthes* sp.), this food has been passed down from generation to

generation and is usually eaten using crimson sauce (Helida & Abubakar, 2018). Lemang is identical to being cooked in bamboo and then burned (Sari & Hudaidah, 2021). However, Lemang *Kancung Beruk* has a difference, the way to wrap this lemang is unique because it uses a semar bag and then cooked by steaming.

One of the advantages of the PBL model is that the use of the PBL learning model requires students to be actively involved in learning. This is in line with research of Puteri (2023) which states that one of the advantages of PBL is that it can increase student activity in learning activities. The influence of local wisdom-based PBL on students' critical thinking skills is inseparable from the characteristics of PBL which uses problems to stimulate, contextualize, and integrate learning (Budiarti & Airlanda, 2019).

With the advantages of the PBL model on students' critical thinking skills. This is also supported by the results of Hasanah et al. (2020) which found that students taught using the local wisdom-based PBL model obtained higher average knowledge learning outcomes than the average learning outcomes using conventional learning with the direct learning (DL) model. Therefore, this study aims to see how the effect of problem-based learning (PBL) based on local wisdom on making Lemang *Kancung Beruk* on students' critical thinking skills.

Method

This research uses a quantitative approach with a quasi-experimental research type and a "Pretest-post-test control group design" research design. The sample selection in this study used a non-probability sampling technique with purposive sampling type. The samples in this research were the VII-A class which consisted of 18 students and the VII-B class which consisted of 18 students. VII-B class is the control class and VII-A class is the experimental class are presented in Table 1.

Table 1. Pretest-posttest control group desain

Class	Pretest	Treatment	Postest
Experimental	T_1	X_1	T_2
Control	T_3	X_2	T_4

Description:
T_1 : Experimental class test before treatment
T_2 : Experimental class test after treatment
X_1 : Learning treatment with problem-based learning model based on local wisdom in making lemang *kacung beruk*.
X_2 : Learning treatment with Model *Direct Learning* (DL)
T_3 : Control class test before treatment
T_4 : Control class test after treatment

The instrument used in this research is test questions in the form of essays with FRISCO indicators namely (Focus, reason, inference, situation, conclusion and overview). The data taken are students' pretest-posttest scores on a scale of 0-100. The instrument used in this research is a test question in the form of an essay with FRISCO indicators, namely (Focus, reason, inference, situation, conclusion and overview). The data taken in the form of student pretest-posttest scores on a scale of 0-100. Then the observation sheet instrument for the implementation of the model syntax. The observation sheet data taken in the form of the implementation of the experimental class and control class syntax using a 1-4 interval linkert scale.

Data analysis was carried out in three stages. The first stage is an analysis of the percentage of critical thinking skills using descriptive statistics, namely the average student score and the percentage increase in student scores for each indicator of critical thinking. In the second stage, an analyzing the consistency of the implementation of the syntax of the learning model with simple linear regression. In the third stage, Ancova test was carried out to see the effect of PBL model based on local wisdom in making Lemang *Kancung Beruk* on students' critical thinking skills. Before carrying out the Ancova test, normality, homogeneity and linearity tests are first carried out. The normality test uses the Kolmogorof Smirnov test and the homogeneity test uses the F test. The decision making criteria for the normality test are if P value > 0.05 then the data is normally distributed. The same is true for the homogeneity test, if P value > 0.05 then the data comes from the same variant. And linearity test criteria if the probability value> 0.05 then the relationship between variables.

The same for the Ancova test if sig value < 0.05 then the research hypothesis is accepted, with the hypothesis

that there is an influence of the PBL model based on lokal wisdom on students' critical thinking skills. To assist data processing, SPSS software was used.

Result and Discussion

Research Results on the Level of Critical Thinking Skills

Pretest questions are given before treatment and posttest questions are given after treatment. From these two tests, data on students' critical thinking skills are presented in Table 2.

Table 2. Critical thinking ability pretest- posttest data

Class	Pretest average	Posttest average	Difference
Experimental class	43.75	70.60	26.85
Control class	43.98	88.19	44.21

Table 2 shows The average value of the experimental class and control class of each of the 18 students in the pretest and posttest increased, the average value of the control class pretest was 43.75 and the experimental class was 43.98, this shows that between the experimental class and the control class had the same initial ability with the difference in the average pretest value not much different, namely 0.23. While the average posttest value in the control class is 70.60 and the experimental class is 88.19, this shows that there is a difference in the final ability with an average difference in value of 17.59, that after being given the average treatment of the experimental class from pretest to posttest is higher with a difference of 44.21 compared to the control class 26.85, meaning that there is an effect of treatment (treatment) from the PBL model based on local wisdom on making Lemang *Kancung Beruk* on students' critical thinking skills.
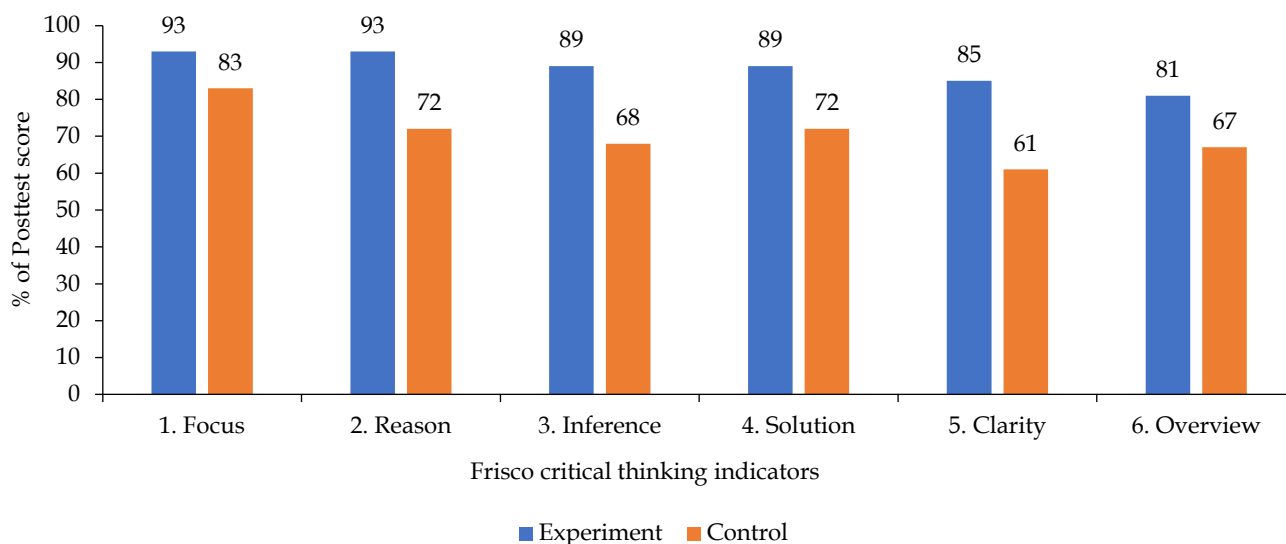

Figure 1. Diagram of percentage (%) of students' posttest score on each KBK indicator

Description: KBK = Critical thinking skills; 1 = Focus (Focusing the question); 2 = Reason (Analyzing the argument); 3 = Inference (Making conclusions); 4 = Situation (Understanding the situation); 5 = Clarity (Explaining further explanation); 6 = Overview (Reviewing the problem thoroughly).

Based on Figure 1, the percentage results of students' posttest scores on each KBK indicator of experimental and control classes for six FRISCO

indicator essay questions informs that the experimental class shows a greater percentage than the control class with focus and reason indicators (93%) obtaining the highest percentage of results, inference and solution (89%), clarity (85%) and the lowest overview indicator (81%). Meanwhile, the control class showed that the highest student KBK indicators remained in the focus indicator (83%), reason and solution (72%), inference (68%), overview (67%) and the lowest in the clarity indicator (67%).
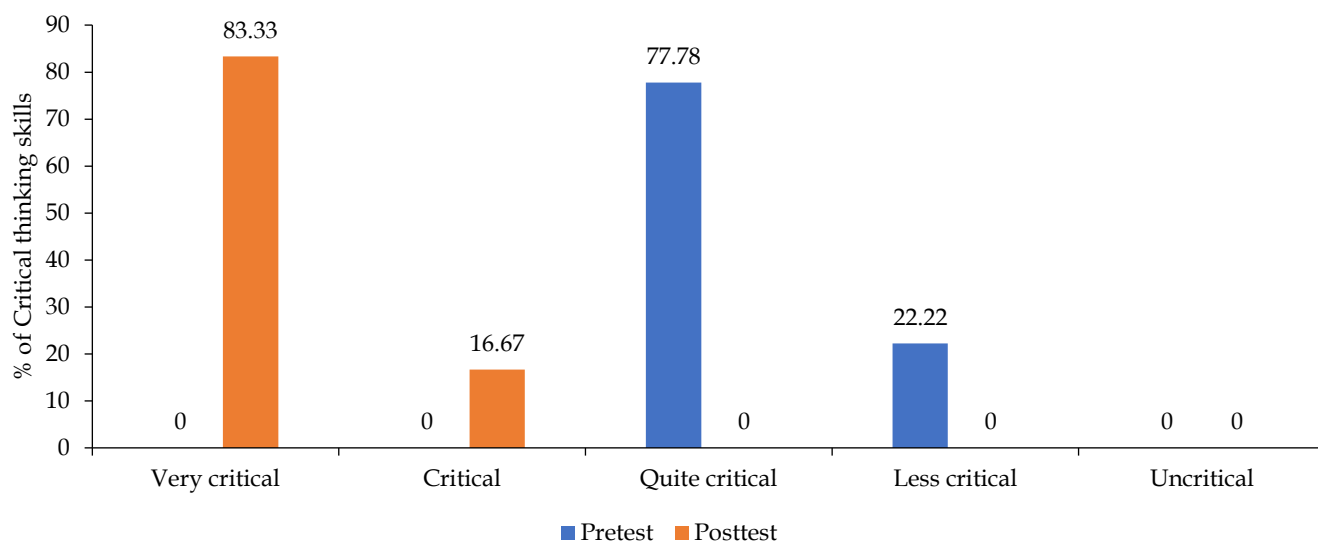

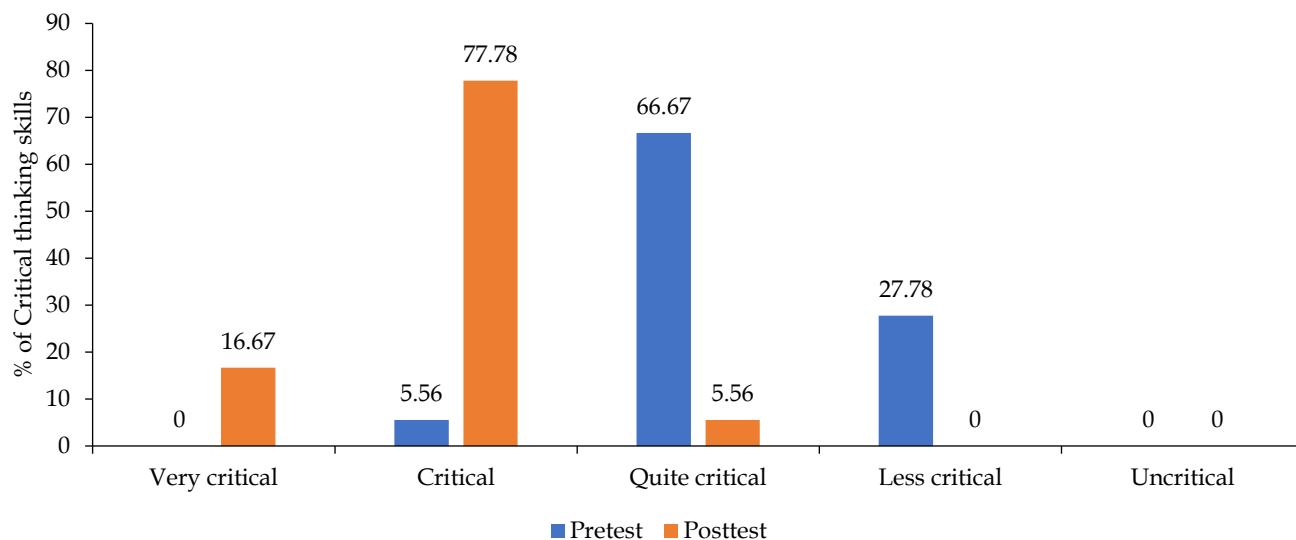**Figure 2.** Graph of category of critical thinking skills experimental class

Figure 3. Graph of category of critical thinking skills control class

Based on Figure 3, the results of the acquisition of the percentage of critical thinking skills of the control class also have an increase from pretest to posttest scores. The category is very critical from 0 to 16.67%, and the highest category is critical in the posttest score of

77.78% from the pretest score of 0%, quite critical 66.67 to 5.56%, less critical 27.78 to 0%, while the lowest in the category is not critical 0%. This also shows that there is an increase in critical thinking skills with the direct learning (DL) learning model.

The results of the analysis of Figures 1 and 2 of the critical thinking skills categories above, show that the experimental class of the problem-based learning (PBL) based on local wisdom is dominated by the very critical category 83.33% and critical 16.67%. While the control class is dominated by the critical category 77.78%, and the value is very critical 16.67%. This is also in line with Kartika et al. (2022), that the wisdom-based PBL model provides a higher difference in critical thinking skills compared to students who use conventional learning models. The results of other studies also show that the application of PBL plays an important role in improving student skills which is identical to involving students actively tends to encourage students to improve their critical thinking skills (Hardiantiningsih et al., 2023).

Consistency Test Results of Model Syntax Implementation
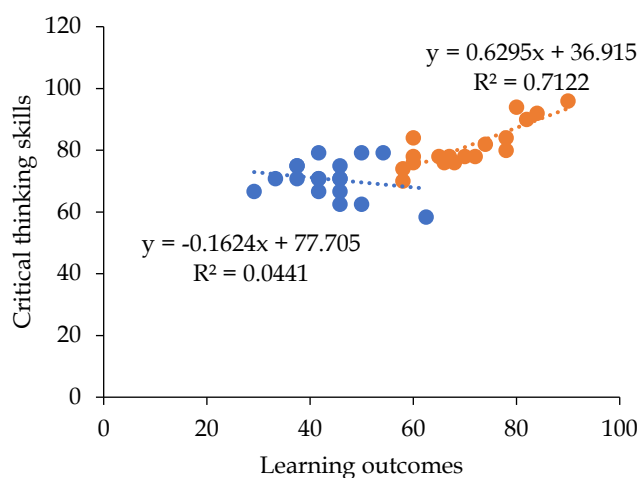*Consistency of Syntax Implementation of Direct Learning (DL) Model*

Figure 4. Consistency graph of implementation of Direct Learning (DL) model syntax in the control class

Based on Figure 4, test the consistency of syntax implementation using multiple regression, on the results of the syntax implementation consistency test there is a parallel test (parallel) and a coincident test (coincident). In the parallel test, the parallel value is < 0.001. In addition, the coincident test was also obtained with a coincident value of 0.023. So that the implementation of the direct learning model syntax in the control class is informed as parallel and incoincident, meaning that the syntax of the learning model in this class is consistently implemented.

Consistency of Syntax Implementation of PBL Model Based on Local Wisdom

Based on Figure 5, the consistency test of syntax implementation is used using multiple regression, on

the results of the syntax implementation consistency test there is a parallel test (parallel) and a coincident test (coincident). In the parallel test, a parallel value of < 0.001 was obtained. In addition, the coincident test was also obtained with a coincident value of 0.003. So that the implementation of the syntax of the PBL model based on local wisdom in the experimental class is informed to be parallel (parallel) and incoincident (not coincident), meaning that the syntax of the learning model in this class is consistently implemented.
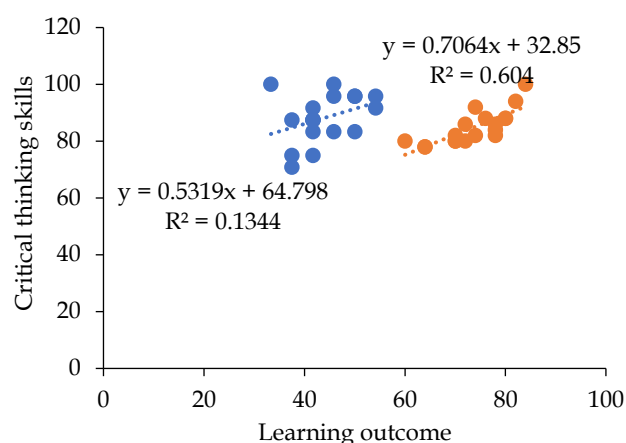

Figure 5. Graph of consistency of syntax implementation of PBL Model Based on Local Wisdom in experiment class

One-Way Ancova Assumptions

Table 3. Residual normality test results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Residual for Post	.141	36	.069	.965	36	.295

a. Lilliefors Significance Correction

The Kolmogorov-Smirnov test results inform that the residual data of students' critical thinking is normally distributed normal [$D(36) = 0.141$, $p = 0.069$].

Table 4. Data variance homogeneity test results

F	df1	df2	Sig.
1.650	1	34	.208

Dependent Variable: Students' Final Critical Thinking.
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Design: Intercept + Pre + Class

The results of Leven's test inform us that the variance of students' critical thinking ability data between one class and another is homogeneous [$F(1.34) = 1.650$, $p = 0.208$].

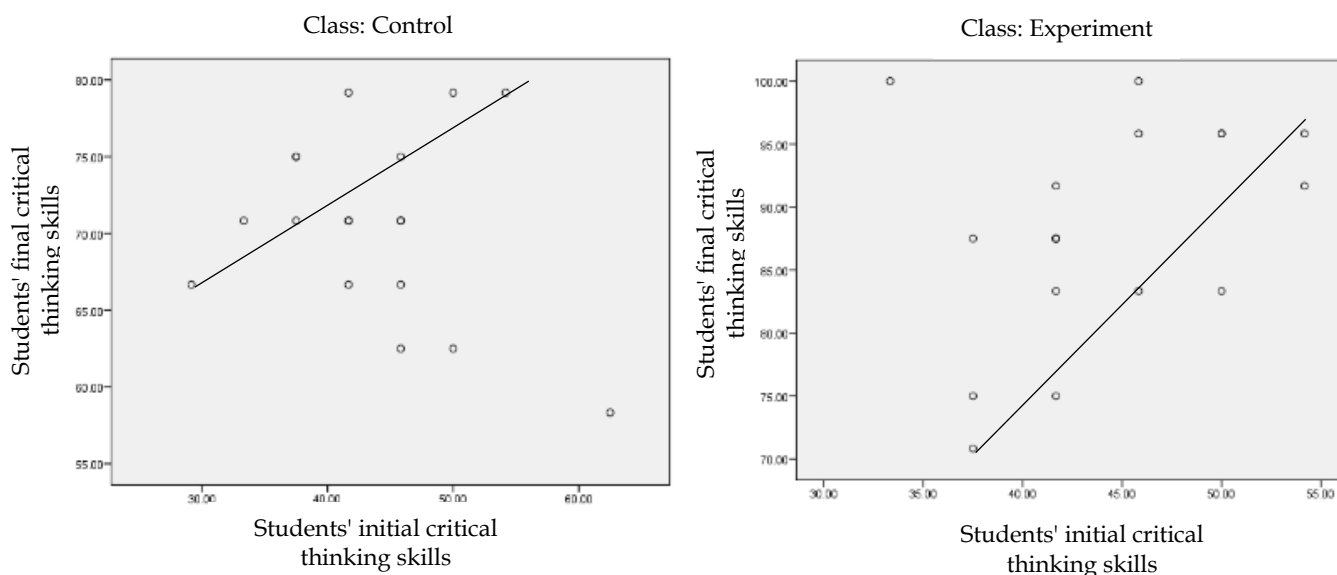*Linearity Test Results of Pretest and Posttest Data in Both Classes*

Figure 6. Scatter plot graph of linearity test of pretest and posttest data

Based on Figure 6, the scatter plot results show that there is linearity in the pretest and posttest data of students' critical thinking skills in both classes.

Table 5. Regression slope homogeneity test results

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	2981.192ᵃ	3	993.731	19.046	.000
Intercept	3882.554	1	3882.554	74.415	.000
Class	31.850	1	31.850	.610	.440
Pre	51.409	1	51.409	.985	.328
Class * Pre	181.437	1	181.437	3.478	.071
Error	1669.584	32	52.175		
Total	231593.445	36			
Corrected Total	4650.776	35			

a. R Squared = .641 (Adjusted R Squared = .607)
Dependent Variable: Students' Final Critical Thinking

The test results showed that the regression slope of the interaction of the independent variable with the covariate on the dependent variable was homogeneous [$F(1.32) = 3.478$, $p = 0.71$].

Hypothesis Test

The one-way ancova assumptions have all been met so that the one-way ancova analysis can be used to test the hypothesis of this study. Then proceed with hypothesis testing and effect size testing.

Table 6. Tests of between-subjects effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2799.755ᵃ	2	1399.877	24.957	.000	.602
Intercept	4638.096	1	4638.096	82.688	.000	.715
Pre	14.554	1	14.554	.259	.614	.008
Class	2777.386	1	2777.386	49.515	<.001	.600
Error	1851.022	33	56.092			
Total	231593.445	36				
Corrected Total	4650.776	35				

a. R Squared = .602 (Adjusted R Squared = .578)
Dependent Variable: Students' Final Critical Thinking

The results of the one-way ancova test inform that the use of local wisdom-based PBL model on making Lemang *Kancung Beruk* has a major effect on critical thinking skills by controlling students' initial critical thinking skills [$F(1.33) = 49.515$, $p < 0.001$, $\eta p2 = 0.600$]. Based on the SPSS ancova test table above, it shows that the p value is < 0.001, meaning that the significance value is < 0.05 so that H0 is rejected and H1 is accepted, which means that there is an influence with a large effect based on the effect size test ($\eta p2 = 0.600$). Then there is no further test because the variance consists of only two classes.

Research Results on the Influence of PBL model Based Lokal Wisdom in Making Lemang Kancung Beruk on Students Crtical Thinking Skills

Based on the results of the one-way ancova hypothesis test conducted, it is proven that there is an

effect of the local wisdom-based PBL model on making Lemang *Kancung Beruk* on critical thinking skills by controlling students' initial critical thinking skills. The effect of the learning model in the experimental class is in the category of a large effect on students' KBK based on the effect size value. In each stage of the syntax of the PBL model based on local wisdom in making Lemang *Kancung Beruk* is linked to the measured student critical thinking indicators. These indicators include F (focus), R (reason), I (inference), S (solution), C (clarity), O (overview).

The magnitude of the influence of the model in the experimental class is strengthened by supporting data from the activities of experimental and control class students on KBK indicators, then teacher activities in the use of model syntax in experimental and control classes with student and teacher activity observation sheets by observers. This is because observation is one of the main ways to understand how students and teachers apply model syntax during the learning process (Mariam et al., 2019).This opinion is supported by Destianingsih et al. (2016) that researchers can find out how much student involvement and enthusiasm, because students who actively and enthusiastically participate in learning will be better prepared to learn independently, solve problems and develop critical thinking skills.

Based on the results of the experimental class student activity observation sheet (PBL based on local wisdom) on the KBK indicator, it was found that student activities from 4 meetings were all in the critical category with the highest indicator in focus and the lowest in overview. While the activity of control class students (DL) on KBK indicators obtained only focus and reason in the critical category, the rest of the indicators of inference, situation, clarty and overview in the category are quite critical. The data from the observation of student activity on the experimental class critical thinking indicators are in the critical category, this means that students are able to focus, able to provide reasons or quick ideas, able to conclude, able to provide further explanation and thorough explanation.

The high focus indicator is due to the indicator being implemented very well in the initial syntax of the first 30 minutes of learning by displaying stimuli and problems in the form of videos, so that concentration, students' willingness to learn is still high by involving audio-visuals that are interesting to students. The low overview indicator in the experimental class in the study was due to the indicator being at the final syntax stage of learning, so that the concentration, focus and willingness to learn of students began to decrease. This is supported by research by Dewi et al. (2019) that normally students have a high level of concentration focus in the first 1 hour of learning, and classes that are given a problem stimulus will be more focused than just using the lecture method of direct learning.

The results of observations of teacher activity per meeting in the experimental class of the PBL model based on local wisdom in making Lemang *Kancung Beruk* are in the category of well done, as well as the control class of the direct learning (DL) model. While the results of observations of teacher activity in the control class model, the highest stage is in the syntax of demonstrating knowledge and skills at the 2nd meeting. In the experimental class, the highest syntax stage is in orienting the problem to students and developing presenting work at the 2nd meeting, this is because in the experimental class the 2nd meeting in the application of PBL based on local wisdom is carried out with a field visit to the place of making Lemang *Kancung Beruk*, so that students recognize the problem directly and students are able to be more active and collaborative in learning.

The aspects of collaboration and activity are two characteristics monitored in the implementation of the local wisdom-based PBL model. The way students collaborate in small groups solving problems, discussing shows how much they are involved in the material. Based on observations made while students were learning, students actively participated in answering the teacher's questions and providing their own ideas in response to their peers' ideas. The division of tasks among group members when completing LKPD, field trip activities on making Lemang *Kancung Beruk*. The local wisdom-based PBL model requires student involvement in the learning process, which allows for an active learning process. This is supported by Puteri (2023), who argues that active involvement in learning activities is one of the advantages of the PBL model. The characteristics of the PBL model using problems to stimulate, contextualize with local content, and integrate learning are closely related to the effect of PBL based on local wisdom on students' critical thinking (Budiarti & Airlanda, 2019).

The increase in students' KBK from pretest to posttest from the PBL experimental class based on local wisdom on making Lemang *Kancung Beruk* is also strengthened by the data from the multiple regression test results to determine the consistency of the implementation of the model syntax, the consistency test results show that the experimental model obtained a parallel value < 0.001 and incoincident 0.003, so that the implementation of the syntax of the local wisdom-based PBL model in the experimental class is informed to be parallel (parallel) and incoincident (not coincident), meaning that the syntax of the learning model in this class is not only well implemented based on observation results but also consistently implemented based on data.

The results of the analysis of the average posttest score show that the experimental class value of the PBL model based on local wisdom on making Lemang *Kancung Beruk* is higher at 88.19 than the control class value of the direct learning (DL) model of 70.60, so that from these data it can be seen that the average posttest score of students in the experimental class there is a big influence of the PBL model based on local wisdom on making Lemang *Kancung Beruk* on critical thinking skills by controlling students' initial critical thinking skills. This is in line with Hasanah et al. (2020) that students taught by the PBL model based on local wisdom on average have higher critical thinking skills compared to the direct learning (DL) model.

The essay test questions given in measuring students' critical thinking skills are of course related to the problem solving process in making Lemang *Kancung Beruk* through video displays, pictures and LKPD presented, then also field visits to the place where Lemang *Kancung Beruk* is made. During classroom learning, students are given several different problems at each meeting, problems regarding the types of special foods that become local wisdom at the kenduri sko traditional event with Lemang *Kancung Beruk* which is the target content domain through videos. Then the next problem is about the fading of local wisdom in making Lemang *Kancung Beruk*, so that making lemang is only limited to parents who make it, even very few students or the current generation have ever tried to eat Lemang *Kancung Beruk* let alone make it. The problems that are oriented to students are related to the science material of substances and their changes, in the sub-materials of substances and the form of substances, changes in the form of substances, physical and chemical changes and the density of substances. Students are directed to analyze the ingredients in making Lemang *Kancung Beruk* by explaining the meaning and local beliefs about this local wisdom such as fluffy glutinous rice which means that in the local community shows unity and intimacy, white coconut milk means sincerity of heart, without the slightest loss, semar bags as a container means a rich and fertile place. This indicates that the local wisdom in making Lemang *Kancung Beruk* contains many moral messages as a form of gratitude for the harvest in the area which is realized in the traditional event kenduri sko.

The application of the local wisdom-based PBL model in this study makes students able to polarize the local wisdom of Lemang *Kancung Beruk*, students are able to identify the characteristics of substances and the form of substances from the ingredients, tools, and even the manufacturing process from start to finish by categorizing each stage in the material of substances and their changes with a field trip to the place of making Lemang *Kancung Beruk* to see the manufacturing process

directly. So that students are able to analyze changes in the form of substances that occur in the process of making Lemang *Kancung Beruk* according to the dose and size. In addition, students are also able to analyze the characteristics of physical and chemical changes in the manufacture of Lemang *Kancung Beruk* and the density or density of substances. This makes students able to answer critical thinking skills indicator questions well because learning displays problems with direct field visits so that the level of student focus becomes the basis for student decisions or answers. This is in line with Kartini & Putra (2020), that some of the factors that influence students' abilities are teachers, facilities provided, learning models, social aspects that exist inside and outside the school, and internal student characteristics such as motivation and willingness.

The increase in students' KBK in the PBL model based on local wisdom is supported by several theories about the advantages of the PBL model based on local wisdom, namely problem orientation by presenting several cases and phenomena at the beginning of learning, students develop skills in cooperative activities and build relationships in groups, group work, focus and concentration so that students' understanding of prior knowledge and what needs to be known can solve the problems presented (Sari et al., 2022). This is supported by Uliyandari et al. (2021) which states that PBL model learning applies real-world problems to students to encourage critical thinking, not rote understanding, but also interpreting the problem.

In addition, the PBL model based on local wisdom in making Lemang *Kancung Beruk* science material phase D substances and their changes can increase knowledge, increase students' KBK because learning associated with local wisdom is oriented towards cultural integrity or community traditions, more contextual in learning materials (Mahardika et al., 2022). This is also supported by Hadi et al. (2019a) stated that local wisdom-based learning is a learning praxis that is very relevant to the development of thinking skills. This learning is based on the utilization of local wisdom, which is sourced from all conditions, real life, and phenomena in the surrounding environment, as a source of science learning, to empower the local potential that exists in each region.

The local wisdom-based PBL model places a strong emphasis on using real-world issues as a framework for teaching students how to think critically and solve problems, this is what makes the local wisdom-based PBL model superior to learning with the direct learning (DL) model." In addition, local wisdom-based learning is more in line with the concept of learning and the surrounding environment, so learning is more interactive and approachable, the material taught is not too different from 'what is often seen or contextual, making it possible to get new learning experiences.' This

is supported by Lubis et al. (2022) in general, students "understand the subject matter and local cultural values contained in the surrounding area where they live, thus helping students develop explanations of scientific phenomena, solve problems, understand concepts, and improve critical thinking skills."

The results of essay questions using six indicators of students' KBK according to Ennis (2011), namely FRISCO, get an average percentage of the posttest value of the KBK of the PBL model based on local wisdom is higher, dominated by very critical compared to the DL model." The results of data analysis show that the highest KBK facts in the experimental class FRISCO indicators are in the focus and reason indicators (93%), The high focus and reason indicators in the study were influenced by the readiness and proficiency of the teacher to revive the learning atmosphere to stay focused and interested. In addition, several other factors that influence are the application of learning according to student needs, learning based on local wisdom, learning innovations that utilize technology and contextualized substance and its changes in everyday life (Fadilla et al., 2021).

Based on the criteria and indicators of critical thinking according to Ennis, Focus students must be able to understand the problems presented by the teacher, the facts that occur students are really able to understand the problems related to local wisdom in making Lemang *Kancung Beruk*, this is because the local content displayed in learning is the local wisdom of making Lemang *Kancung Beruk* which is close to students, so that students become familiar and can relate the problems presented to the material of substances and their changes, besides that because the teacher conveys the problem through video exposure accompanied by teacher explanations that are brief and easy for students to understand. This contradicts the results of Pratiwi & Setyaningtyas (2020) research, because the presentation of the problem is only a story without a video, without a local content base so that students' ability is limited in imagining the problem presented in the focus indicator.

Furthermore, namely reason, students are able to compose designs about solving cases clearly, able to argue with convincing reasons, the fact is that in research students are able to compose answer sentences to solve problems clearly. The high reason indicator in the experimental class is also influenced by the focus indicator, where students who focus very well in learning will respond to convey responses or opinions about the stimulus of what the focus indicator shows.

Therefore, the focus and reason indicators in this study are the findings of the highest critical thinking indicators at each meeting. This is also in line with the results of the assessment of the student activity observation sheet in this study which shows the results

of activity on students' KBK indicators in the critical category and the highest on the focus indicator. Then it is also supported by observations of teacher activity syntax implementation by observers that the application of focus indicators is a very good implementation indicator in the syntax of PBL based on local wisdom in making Lemang *Kancung Beruk*.

Students' critical thinking skills focus and reason indicators in the PBL model based on local wisdom are developed in the syntax of learning activities through the student problem orientation stage and the stage of organizing students carried out in the initial 30 minutes of learning where the focus, psychic and willingness to learn students are still high. This is in line with Setyani & Ismah (2018), the strength of a person's learning after 30 minutes will decrease, the tendency to decrease student attention and focus is parallel to the length of time the learning is carried out and the model applied to students, so that students are not bored and continue to interact in learning. This is confirmed by Lidiawati et al. (2022) that in the application of focus indicators, students can choose appropriate experiments to prove a phenomenon with various types of experiments presented while reason is presented through discourse, questions about the problems displayed to explain the supporting reasons.

The next KBK indicator is followed by inference and situation (89%), inference is drawing conclusions from observations made during the experiment, making conclusions or problem solving decisions that are reasonable and convincing." In the application of the local wisdom-based PBL model in the experimental class, the inference indicator is developed in the syntax stage of guiding individual or group investigations given a discourse in the form of LKPD, completing LKPD in groups about making Lemang *Kancung Beruk*, concluding the results of observations.

In the implementation of these indicators, students have been able to carry out discussions well, high curiosity, responsibility and thoroughness and cooperation in groups. In addition, the teacher also provides keywords such as when Lemang *Kancung Beruk* is cooked on the stove with medium heat, if the lid of the pot is opened, the steamer water will sound and evaporate, the evaporation process is a change in the form of what substance and from what substance. The teacher also provides discussion references such as sources to read so that students do not experience difficulties when looking for answers to cases or problems.

The situation indicator understands the problem situation through relevant terms and parts." In line with Lidiawati et al. (2022) that students' ability to predict the results of observations from an experiment is indicated by the situation indicator. This indicator is developed

through the activity of explaining or presenting the results of making Lemang *Kancung Beruk* which is developed and related to substance material and its changes at the syntax stage of developing and presenting learning outcomes. The implementation of situation indicators in the "PBL model based on local wisdom in making Lemang *Kancung Beruk* is carried out by the teacher during observations to the field visited or preparing the results of problem solving on LKPD discourse related to substance material and its changes in the form of cartons, LKPD reports per group.

The last two indicators are clarity (85%) testing students' ability to identify types of substance changes, and overview (81%) the ability to verify, make decisions or conclusions as a whole from what they think (Nur et al., 2023). In applying the local wisdom-based PBL model in the experimental class, the clarity indicator makes observations, observations in the field, classifies the types of changes in substances from what is observed and then presents. While overview, question and answer, discussion about what is presented, and making conclusions from a comprehensive decision related to the material. The clarity indicator in the local wisdom-based PBL learning process on making Lemang *Kancung Beruk* can be maximized "at the stage of evaluating the results of problem solving." While the overview can be increased in the syntax stage of analyzing and evaluating the results of the work.

Based on these results, it can be seen even though the percentage is high with 81%. The overview indicator has the lowest score of the six indicators. This is due to several factors including the overview seen from the learning syntax is in the last syntax before the closing stage, where student focus and concentration are reduced. Another factor is that some students do not carry out checking and checking activities from start to finish. So that some experience problems in making decisions or conclusions as a whole from what is observed. In addition, students' memory capacity to remember learning from four meetings is limited, they remember more sub-chapters than the whole at once. This is supported by the results of Setiana et al. (2020) which states that the overview indicator is the lowest indicator of FRISCO, the reason is because based on the questionnaire analysis of the overview of the FRISCO KBK indicators in their research, students understand the material subchapters more than the material as a whole and make overall decisions from what is done.

When referring to the six indicators that have been described one by one, a thought can be drawn "that students who think critically will provide information" based on authentic evidence, this thinking is in line with the results of Fitriani et al. (2020) which analyzes that the application of PBL based on local wisdom plays an important role in improving critical thinking skills.

Hardiantiningsih et al. (2023) also suggested that "when a similar PBL model is used, students will be actively involved, student involvement tends to help them improve critical thinking skills.

Conclusion

The research findings lead to the conclusion that there is an effect of the local wisdom-based PBL model on making Lemang *Kancung Beruk* on critical thinking skills by controlling students' initial critical thinking skills at a significance level of $p < 0.001$ and effect size $\eta p2 = 0.600$ on the science material of substances and their changes, this is also seen in the average posttest value of the experimental class much higher than the control class. So that there are differences in students' critical thinking skills before and after using the model in the experimental class.

Conflicts of Interest
The authors declare that there is no conflict of interest regarding the publication of this paper.

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