

## THE INFLUENCE OF THE PjBL VS DIRECT INSTRUCTIONAL MODEL AND INITIAL ABILITY ON KNOWLEDGE AND SKILLS

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### ABSTRACT

*The objectives of this development are to (1) To examine differences Model Project Based Learning (PjBL) and initial ability to learn knowledge and skills in economics subjects. This experimental research was carried out using a Factorial 2 x 2 with multivariate analysis technique (Anonymous). The subjects in this study are grade XI students consisting of four classes with 130 students SMA Negeri 1 Ketapang. The subjects that were the focus of the experiment were taken at classical randomization, namely four classes of ABCD from SMA Negeri 1 Ketapang. The hypothesis of this study was tested using a statistical test analysis multivariate (Anonymous). The results of the calculation show that: (1) There is a difference Knowledge students who use model PjBL and methods direct instruction in grade XI students SMA Negeri 1 Ketapang, (2) There is a difference Knowledge students who have Initial abilities tall and who has Initial abilities low in grade XI students SMA Negeri 1 Ketapang, (3) There is an interaction between model PjBL and methods direct instruction with Initial abilities against Knowledge in grade XI students SMA Negeri 1 Ketapang, (4) There is a difference Skills students who use model PjBL and methods direct instruction in grade XI students SMA Negeri 1 Ketapang, (5) There is a difference Skills students who have Initial abilities tall and who has Initial abilities low in grade XI students SMA Negeri 1 Ketapang, (6) There is an interaction between model PjBL and methods direct instruction with Initial abilities against Skills in grade XI students SMA Negeri 1 Ketapang. Based on the results of the study, it was concluded that by using model PjBL and Initial abilities can improve Knowledge and Skills students in Economics class XI SMA Negeri 1 Ketapang.*

**KEYWORDS** PjBL Model, Direct Instructional, Initial Ability, Knowledge, Skills.



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## INTRODUCTION

Economics subjects are inseparable from students' knowledge in improving their intellect. According to (Čavić et al., 2022; Ilahiyyah et al., 2021) Knowledge is essentially everything that is known about an object, including science. Further (Farid et al., 2021; Kundu & Perwez, 2022) It reveals that each type of knowledge essentially answers a specific type of question and has specifics about what (ontology), how (epistemology), and for what (axiology) the knowledge is composed and that these three foundations are interrelated.

In economic learning, teachers pay less attention to knowledge in teaching Economics subjects. During the learning process at school, only practical material or leading to psychomotor aspects is given, but the knowledge or intelligence is rarely learned or only taught a little during practical learning. It should be the ideal goal that the Economics subject is comprehensive, namely concerning the educational aspect, namely the knowledge aspect and the skill aspect. The teaching and learning process is said to be good if students have understood the material that has been taught by the teacher, so that the goals of the learning are achieved. So in good learning, it should include all comprehensive aspects, both knowledge and skill aspects (Rohmah, 2023; Triyanto et al., 2022; Umami, 2022).

Based on interviews with some students of Class XI of SMA Negeri 1 Ketapang, it shows that students do not know much about the knowledge of Economics subjects. Then according to information from the Economics subject teacher that the truth about learning, in fact knowledge or theoretical learning is only taught during practical learning, so that students lack debriefing their knowledge of Economics subjects. The knowledge aspect includes the concepts of Economics Subjects.

Given the importance of education for the community, especially at the elementary to high school levels, the government needs to pay more attention to the world of education so that all elements of society get a proper education. Therefore, it is necessary to improve the quality of education through adequate infrastructure and improve students' knowledge and skills in carrying out learning activities (Nirmalasari & Winarti, 2020; Sumartini et al., 2021). Therefore, teachers have an important role in producing a competent young generation of the nation's successors to be able to compete in this modern era to become the key to national development.

Learning activities at the high school level, especially in Economics Subjects, there are still many students who have difficulties in understanding Economics Subjects, some of which are abstract. This is coupled with the fact that there are still many educators who teach only by the lecture method (direct instructional) and are rarely accompanied by practicum or demonstrations, making it more difficult for students to understand Economics subjects. The tendency to use this direct instructional method makes many students less actively participate in learning activities, making students easily bored and bored. Therefore, educators are required to be skilled in organizing learning activities and be able to choose the appropriate learning method or model to use.

The learning model is an important part of learning activities. However, in schools there are still many educators who tend to use a learning model centered on educators. The problems mentioned above were also found in Class XI of SMA

Negeri 1 Ketapang. Based on the results of initial observations, it was found that learning activities more often use the direct instruction model, but not all phases are implemented.

In carrying out learning activities, educators often go through a phase where students try directly or visualize the material being taught and tend to only provide material through lectures. Students also rarely do experiments or practicums. This is what makes learning activities monotonous or less varied in the delivery of physics material. This makes students only do listening and note-taking activities, thus making the interaction between educators and students very minimal. This problem can affect students' interest in learning and make students' physics learning outcomes low, this can be seen from the results of the Final School Examination (UAS) of students who are still under the KKM and many students do not like learning Economics subjects.

Efforts to overcome the problem of students' knowledge and skills by being able to create appropriate, fun learning innovations and encourage students to be able to express their creativity through the learning process. One of the learning innovations that can train and develop students' knowledge and skills by using a learning model Project Based Learning (PjBL) (Izzah et al., 2021; Rais et al., 2021). The PjBL learning model is a learning model that can bridge the achievement of knowledge and skill development, in PjBL students go through a wider inquiry process (searching in their own way) to respond to complex questions, problems or challenges (Karnando et al., 2021; Rahman et al., 2021). Based on previous research, it has been shown that PjBL has an effect on students' creative skills and learning outcomes (Fajria et al., 2022; Rahmadana, 2022; Wahyudi et al., 2021).

PjBL is a project-based learning model where students design a problem and solve it themselves, so that it can increase students' creativity in producing their own problem solving, forming more meaningful learning activities so that they are easy to remember (Chen & Yang, 2021; Kundu, 2021; Sari & Prasetyo, 2021). This PjBL learning model can help students by acquiring new concepts, new experiences, and can increase students' creativity in solving or solving a problem or in producing a product or work (Faridah et al., 2022; Maksum & Purwanto, 2022; Mursid et al., 2022).

PjBL has the characteristics that students can make decisions and can create frameworks, design processes to achieve results, from the results in the form of products or works will be evaluated for quality (Guo et al., 2021; Yamada, 2021; Zayyinah et al., 2022). PjBL is a learning model that aims for students to play an active role in learning, manage assignment time when studying, solve problems, combine the right learning, and produce a product or a work according to the results of creative thinking (Saidaturrahmi et al., 2021; Yin & Huat, 2021).

One of the characteristics analyzed in the PjBL learning model is initial ability. Initial ability is the level of knowledge that students have before the start of learning. Initial abilities are often considered the same by teachers when in reality this is not necessarily the case. According to the ability early has the greatest impact on learning. Those who have good starting abilities can learn better. The research predicts that early ability also affects learning outcomes, so researchers choose early ability as the moderator variable.

## RESEARCH METHODS

Regarding the type of research and variables, the design of this study uses a 2 x 2 factorial with a multivariate analysis technique (*Anonymous*). The research design is as follows:

**Table 1 Research Design**

Learning Strategy (A)	Initial Ability Level (B)	
	High starting ability (B1)	Low starting ability (B2)
<i>Model Project Based Learning (PjBL) (A1)</i>	(A1B1)	(A1B2)
<i>Metode direct instruction (A2)</i>	(A2B1)	(A2B2)

The design of this study is shown by a matrix-shaped table consisting of 4 cells generally written as matrix A for learning strategies and matrix B as initial ability. In this case, matrix (A1) is the *Project Based Learning Model (PjBL)* and (A2) is the *direct instruction method*. For the matrix (B1) the initial ability is high and while (B2) the initial ability is low. The initial proficiency level is high when students score above the median score, while the score is equal to or below the median in the group at the low initial ability level.

In this study, the author uses the Random Sampling technique, Random Sampling is a way of sampling by providing the same opportunity for the population to be used as a sample member. One of the methods used in random sampling is *Quota Sampling*. *Quota Sampling* is a method of sampling that is not based on a predetermined number (Suggestion, 2017).

Next, the researcher takes 2 groups/class among the 4 existing groups/classes which are then determined into the control group and the experimental group as in the following table.

**Table 2 Research Subject**

Population		Subject		Information
Class	Student	Class	Sum	
4	130	XI-MIPA1	35	Kelas <i>Model Project Based Learning (PjBL)</i>
		XI-MIPA2	35	
		XI-MIPS1	30	Direct instruction method class
		XI-MIPS1	30	

To test the hypothesis that has been put forward in the previous discussion, a data analysis technique is used, namely: Multivariate analysis technique. (Manova). The requirement for the use of inferential statistics in testing research hypotheses is to pay attention to the distribution of data, and the distribution of the data must meet the Normality (Suggestion, 2019). Therefore, before the data is used for testing research hypotheses, it is necessary to first conduct normality and homogeneity testing. After the data is known to be normally distributed and homogeneous, then for the testing of the research hypothesis, inferential statistical analysis is used, in this case the Multivariate

(Manova) analysis. The normality test used the Kolmogorov Smirnov test and the homogeneity test used the Levine test with SPSS 25.

## RESULT AND DISCUSSION

In accordance with the research problems that have been submitted in chapter I and the hypotheses that have been submitted in chapter II as well as to answer the research problems and test the hypotheses that have been raised, an analysis of the value of Economics learning outcomes is carried out.

The following will present the results of the research which include: statistical description of the value of Economics learning outcomes, the results of the requirements test to use statistical analysis of reliability tests, validity, normality, homogeneity, and statistical analysis of Manova used to test the hypothesis that has been processed.

The learning outcomes of students obtained based on the value of economic learning outcomes in each group given the PjBL model and the group given the *direct instruction method* are presented in the following tables and diagrams:

**Table 3 Description of Economics Learning Outcome Data**

		Descriptive Statistics			
	MODEL MENGAJAR	KEMAMPUAN AWAL	Mean	Std. Deviation	N
PENGETAHUAN	PJBL	tinggi	69.2973	6.45439	37
		rendah	76.3571	4.95322	28
		Total	72.3385	6.79678	65
	DIRECT INSTRUCTION	tinggi	62.3125	1.81544	16
		rendah	62.6939	1.85072	49
		Total	62.6000	1.83542	65
	Total	tinggi	67.1887	6.34598	53
		rendah	67.6623	7.39240	77
		Total	67.4692	6.96301	130
KETERAMPILAN	PJBL	tinggi	69.2973	6.45439	37
		rendah	76.3571	4.95322	28
		Total	72.3385	6.79678	65
	DIRECT INSTRUCTION	tinggi	62.3125	1.81544	16
		rendah	62.6939	1.85072	49
		Total	62.6000	1.83542	65
	Total	tinggi	67.1887	6.34598	53
		rendah	67.6623	7.39240	77
		Total	67.4692	6.96301	130

(Source: processed SPSS)

From the table above, it can be explained that the total value of learning outcomes with the PjBL model on knowledge has a mean of 72, 3385 and a standard deviation of 6.79678. Of the 65 students who were given the PjBL model, 37 students had high initial abilities and 28 students had low initial abilities. The average (*mean*) of students who have a high starting ability is 69.2973 with a standard deviation of 6.45439, while

students who have an average low starting ability of 76.3571 with a standard deviation of 4.95322.

The total value of learning outcomes with *the direct instruction* method on knowledge has a mean of 62.6000 and a standard deviation of 1.85072. Of the 65 students who were given *the direct instruction* method, 16 students had a high initial ability and 49 students had a low initial ability to the value of knowledge. The average (*mean*) of students who have a high starting ability is 62.3125 with a standard deviation of 1.81544, while the average low starting ability (*mean*) is 62.6939 with a standard deviation of 1.85072.

From the table above, it can be explained that the total value of learning outcomes with the PjBL model on skills has a mean of 72.3385 and a standard deviation of 6.79678. Of the 65 students who were given the PjBL model, 37 students had high initial abilities and 28 students had low initial abilities. The average (*mean*) of students who have a high starting ability is 69.2973 with a standard deviation of 6.45439, while students who have an average low starting ability of 76.3571 with a standard deviation of 4.95322.

The total value of learning outcomes with *the direct instruction* method on skills has a mean of 62.6000 and a standard deviation of 1.85072. Of the 65 students who were given the *direct instruction* method, 16 students had a high initial ability and 49 students had a low initial ability to value knowledge. The average (*mean*) of students who have a high starting ability is 62.3125 with a standard deviation of 1.81544, while the average low starting ability (*mean*) is 62.6939 with a standard deviation of 1.85072.

The hypothesis test of this study uses multivariate analysis. The researcher uses *SPSS for windows 25.0* to perform the calculation of the multivariate analysis test. The calculation is used to test hypotheses 1, 2, 3, 4, 5, and 6. A summary of the calculation results is presented in the following table:

**Table 4 Multivariant Hypothesis Test Results**

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	PENGETAHUAN	3878.373 <sup>a</sup>	3	1292.791	68.557	.000
	KETERAMPILAN	3878.373 <sup>a</sup>	3	1292.791	68.557	.000
Intercept	PENGETAHUAN	502969.734	1	502969.734	26672.593	.000
	KETERAMPILAN	502969.734	1	502969.734	26672.593	.000
MODEL	PENGETAHUAN	2927.182	1	2927.182	155.229	.000
	KETERAMPILAN	2927.182	1	2927.182	155.229	.000
KEMAMPUAN_AWAL	PENGETAHUAN	380.172	1	380.172	20.161	.000
	KETERAMPILAN	380.172	1	380.172	20.161	.000
MODEL * KEMAMPUAN_AWAL	PENGETAHUAN	306.228	1	306.228	16.239	.000
	KETERAMPILAN	306.228	1	306.228	16.239	.000
Error	PENGETAHUAN	2376.004	126	18.857		
	KETERAMPILAN	2376.004	126	18.857		
Total	PENGETAHUAN	598027.000	130			
	KETERAMPILAN	598027.000	130			
Corrected Total	PENGETAHUAN	6254.377	129			
	KETERAMPILAN	6254.377	129			

a. R Squared = .620 (Adjusted R Squared = .611)

Source: (processed by SPSS)

### 1. Hypothesis Testing 1

Ho : There was no significant difference in student knowledge in Economics between the group of students who learned to apply the PjBL model and the group of students who applied the direct instruction *method of learning*.

Hi : There is a significant difference in student knowledge in Economics between the group of students who apply the PjBL model and the group of students who apply the direct instruction *method of learning*.

Based on the results of data analysis with multivariate analysis, a value with a *p value* of 0.000 (*p value* < 0.05) was obtained, which means that Ho was rejected and Hi was accepted, meaning that there was a significant difference in student knowledge in Economics subjects between the group of students who learned to apply the PjBL model and the group of students who applied the direct *instruction method* of learning. Thus, it can be said that the application of the PjBL model has a better influence than the direct instruction *method* on students' knowledge.

### 2. Hypothesis Testing 2

Ho : There was no significant difference in students' knowledge in Economics subjects, between the group of students and high starting ability and the group of students with low starting ability.



- Hi : There is a significant difference in student knowledge in Economics subjects, between the group of students with high starting ability and the group of students with low starting ability.

Based on the results of the data analysis, the value of  $P$  value 0,001 ( $P$  value  $< 0.05$ ) so that  $H_0$  was rejected and  $H_1$  was accepted, which means that there is a significant difference in student knowledge in Economics subjects, between student groups and Initial abilities high and group of students Initial abilities low. Therefore, it can be said that Initial abilities high has a better influence than Initial abilities which is low on the results of student knowledge.

### 3. Hypothesis Testing 3

- $H_0$  : There was no significant interaction between the application of the PjBL model and initial abilities and students' knowledge in Economics subjects.
- $H_1$  : There was a significant interaction between the application of the PjBL model and initial abilities and students' knowledge in Economics subjects.

From the results of ANAVA two value paths  $p$  value = 0,000 ( $P$  value  $< 0.05$ ) so that  $H_0$  is rejected and  $H_1$  is accepted, which means that there is a significant interaction between the application of model PjBL and method *direct instruction* and Initial abilities with students' knowledge in Economics subjects.

### 4. Hypothesis Testing 4

- $H_0$  : There was no significant difference in student skills in Economics between the group of students who learned to apply the PjBL model and the group of students who applied the direct instruction *method of learning*.
- $H_1$  : There was a significant difference in student skills in Economics between the group of students who applied the PjBL model and the group of students who applied the direct instruction *method of learning*.

Based on the results of data analysis with multivariate analysis, a value with  $p$  value 0.000 ( $p$  value  $< 0.05$ ) was obtained, which means that  $H_0$  was rejected and  $H_1$  was accepted, meaning that there was a significant difference in student skills in Economics between the group of students who learned to apply the PjBL model and the group of students who applied the direct instruction method of learning. Thus, it can be said that the application of the PjBL model has a better influence than the direct instruction *method* on students' skills.

### 5. Hypothesis Testing 5

- $H_0$  : There was no significant difference in student skills in Economics subjects, between the group of students and high starting ability and the group of students with low starting ability.



Hi : There is a significant difference in student skills in Economics subjects, between the group of students with high starting ability and the group of students with low starting ability.

Based on the results of the data analysis, the value of  $P\text{ value } 0,001$  ( $P\text{ value } < 0.05$ ) so that  $H_0$  was rejected and  $H_1$  was accepted, which means that there is a significant difference in student skills in Economics subjects, between student groups and Initial abilities high and group of students Initial abilities low. Therefore, it can be said that Initial abilities high has a better influence than Initial abilities which is low to the results of students' skills.

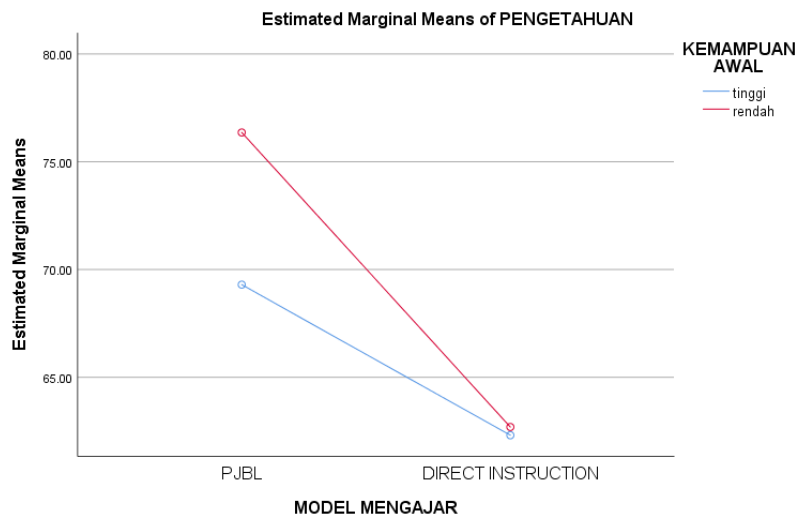
#### 6. Hypothesis Testing 6

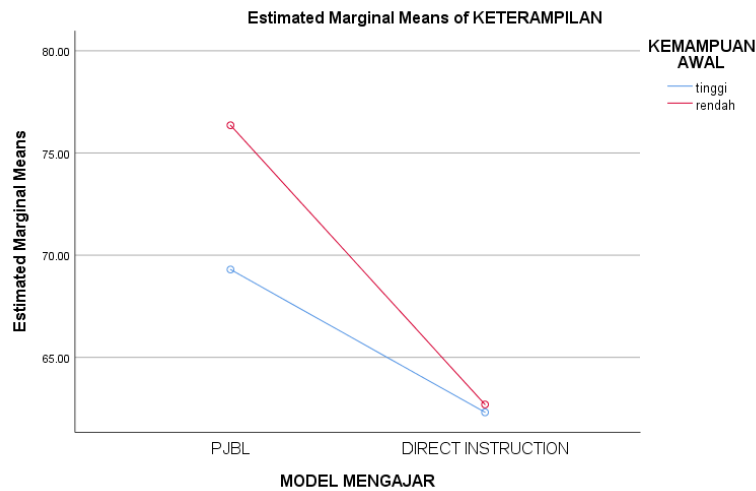
$H_0$  : There was no significant interaction between the application of the PjBL model and the initial ability with students' Skills in Economics subjects.

$H_1$  : There was a significant interaction between the application of the PjBL model and initial abilities with students' Skills in Economics subjects.

From the results of ANAVA two value paths  $p\text{ value } = 0,000$  ( $P\text{ value } < 0.05$ ) so that  $H_0$  is rejected and  $H_1$  is accepted, which means that there is a significant interaction between the application of model PjBL and method *direct instruction* and Initial abilities with students' skills in Economics subjects.

Significant results there is an interaction between the application of the direct instruction *method* and initial abilities with students' Knowledge and Skills in Economics subject is also strengthened by Figure 1, as follows:





**Figure 1 Interaction Results**

Figure 1 shows that there is a meeting line or intersection of students' Knowledge and Skills data in Economics subjects between low and high initial ability in the control group (direct instruction *method*) and experiment (PjBL model).

**A. There is a Difference in Knowledge between Groups of Students whose Learning Uses the PjBL model and Groups of Students whose Learning Uses the direct instruction method**

Based on the results of the hypothesis 1 test that has been calculated, showing a significance level of  $0.000 < 0.05$ , it can be concluded that the direction of the difference is shown by the average knowledge with the PjBL model and the direct instruction method which is shown by the Economics learning outcomes of students who have high initial ability and who have initial ability low in grade XI students of SMA Negeri 1 Ketapang. There is a difference in the knowledge of students who use the PjBL model with the direct instruction method in grade XI students of SMA Negeri 1 Ketapang.

Based on the results of the hypothesis test above that the PjBL model can improve students' knowledge, the researcher found the difference in knowledge between the PjBL model and the direct instruction method and showed a significant number of knowledge. Dimiyati & Mudjiono (2013:135) stated that the PjBL model is a learning approach that relates the material learned to the real life of students, both in the family, school, community and citizen environment, with the aim of finding the meaning of the material for their lives.

Based on research conducted at S SMA Negeri 1 Ketapang, it shows that the PjBL model naturally seeks the meaning of the context in accordance with the real situation of a person's environment through the search for reasonable and useful relationships.

Through the combination of the material learned with daily experience, students produce the basics of in-depth knowledge. Students are able to use their knowledge to solve new and unprecedented problems by increasing their experience and knowledge. Students can build their knowledge that is applied in daily life by combining the subject matter they have received at school.

According to Trianto (2007:108), contextual learning refers to the theory of constructivist learning, where the contextual learning model emphasizes that learning is not just memorization, recording and listening. However, students must be able to construct (build) knowledge in their own minds from the results of observation and understanding of something that is happening around them. Knowledge must be whole and inseparable. The teaching and learning process is more student-centered than teacher-centered.

Most of the time the teaching and learning process takes place based on learning activities for students of SMA Negeri 1 Ketapang. In this study, the researcher showed that the PjBL model in learning became more meaningful and real. This means that students can capture the relationship between learning experiences at school and real life. This is very important, because by being able to correlate the material found with real life, not only for students the material functions functionally, but the material they learn is closely embedded in the student's memory, so it will not be easily forgotten.

Thus, the researcher concluded that his research conducted at SMA Negeri 1 Ketapang that the PjBL model is a more productive learning and is able to foster the strengthening of concepts to students because of the PjBL model, students are guided to find their own knowledge. Through the philosophical foundation of constructivism, students are expected to learn through experience, not memorization. The PjBL model is not only a place to obtain information, but as a place to test the data of their findings in the field.

The application of the PjBL model in schools provides opportunities for students to do meaningful tasks, providing meaningful experiences to students. This learning is carried out through group work, discussion, and mutual correction between friends by providing opportunities for students to create a sense of togetherness, cooperation, and mutual understanding between each other in depth.

#### **B. Differences in Student Knowledge in Economics between the Group of Students Who Have High Initial Ability and the Group of Students Who Have Low Initial Ability**

Based on the results of the hypothesis 2 test that has been calculated, showing a significance level of  $0.000 < 0.05$ , it can be concluded that there is a difference in the biology learning outcomes of students who have high initial ability and low initial ability in grade XI students of SMA Negeri 1 Ketapang.

Based on the results of research conducted at SMA Negeri 1 Ketapang, it was found that there was a difference in the learning outcomes of Economics students who had high initial abilities and those who had low initial abilities and the researcher showed that: (1) Mastery of the concept of students who had high initial abilities through the PjBL model higher than students with low initial ability. (2) Students' creative thinking ability through the application of the PjBL model is more creative than the direct instruction method. (3) The ability to compile students' concept maps through the application of the PjBL model is more active than the direct instruction method. (4) Students' mastery of concepts has a strong effect on the ability to solve problems and compile concept maps through the application of the PjBL model compared to the direct instruction method. (5) The learning outcomes or grades obtained by students who have high initial abilities are more prominent and have approached the SKM (Minimum Graduation Standard) of the grades that have been set by the school than those who have low initial ability.

According to Dimiyati & Mudjiono (2013), the high and low initial ability shows the difference in individual tendencies in striving to achieve an achievement. Initial ability is the desire that activates, drives, channels and directs individual attitudes and behaviors to learn. The overall motivation is both from outside and within students by creating a series of efforts to prepare certain conditions that lead to learning activities so that the goals can be achieved.

Thus, the results of the research at SMA Negeri 1 Ketapang, the researcher revealed that early ability determines learning perseverance. Students who have early abilities and high enthusiasm for learning are influenced by several factors, namely encouragement from those around them, high optimism, goals achieved, awards if they get good grades, and more attention from parents. High initial ability can affect student learning outcomes. In the classroom, the researcher found many students who were enthusiastic about learning, paid attention to their teachers, asked a lot of questions in class, had a high sense of curiosity, and took their assignments seriously.

Meanwhile, the low initial ability according to research at SMA Negeri 1 Ketapang can be caused by many factors. These factors are low self-confidence, laziness to learn, lack of concentration, lack of attention from parents, and no one to encourage. Low initial ability can cause students to be lazy to learn so that it can cause students to get low learning outcomes. In the classroom, the researcher found that some students were lazy to study, lazy to do assignments, had no desire to know what other friends were doing, did not care about their teachers, did not care about their grades, and had no sense of enthusiasm in the classroom.

### **C. Interaction between the Influence of the PjBL model, direct instruction method and students' initial ability on Students' Knowledge in Economics Subjects**

Based on the results of the hypothesis 3 test that has been calculated, showing a significance level of 0.041 and less than 0.05, it can be concluded that there is an interaction between the PjBL model and the direct instruction method with the initial ability to Knowledge in grade XI students of SMA Negeri 1 Ketapang.

Based on hypothesis testing using a multivariate analysis formula, it turns out that this third hypothesis is also proven. This makes it clear that using the PjBL model, the direct instruction method and the initial ability to Knowledge together provide a significant interaction on the achievement of Economics learning outcomes.

In a study conducted at SMA Negeri 1 Ketapang, it was found that there was a difference in the learning outcomes of students who used the PjBL model with the direct instruction method because the PjBL model was more dominant in interacting with students and was included in the four main principles in the learning process (Trianto, 2007), namely First, interaction process (students actively interact with teachers, peers, multimedia, references, environment). Second, the communication process (students communicate their learning experiences with teachers and other peers through stories, dialogues). Third, the reflection process, (students rethink about the meaning of what they have learned, and what they have done). Fourth, the exploration process (students experience directly by involving all their senses through observation, experiments, and investigations).

Based on the results of the research, the researcher revealed that using the PjBL model that must be considered is understanding the characteristics of students, getting

to know students individually, utilizing student behavior in organizing learning, developing critical thinking, creativity, and problem-solving skills, developing the classroom as an interesting learning environment, Utilizing the environment as a source of learning, providing good feedback to improve learning activities, distinguishing between physically active and mentally active.

For the direct instruction method in the research applied at SMA Negeri 1 Ketapang, the researcher showed that there was no good interaction from the direct instruction method, only that students knew and memorized the subject matter. In the selection of information or materials in the classroom is based on the needs of students, even though in the classroom the level of students' abilities is different so that researchers will have difficulty in determining the subject matter because the level of achievement is not the same. The learning process with the direct instruction method appears clear between students who have high abilities and poor abilities, which then causes inconfidence for students who lack ability.

The researcher pointed out his research that there are often difficulties in keeping students interested in what they are learning, teaching activities become verbalism. Students who are more responsive from the visual side will be a loss and students who are more auditory can receive it more. It is boring for too long and students are passive, and it is difficult to control the extent of students' knowledge acquisition

Thus, in this study, it can be said that the interaction between the PjBL model, with the direct instruction method and the initial ability to Knowledge can generate stimulation both from within (internally) and from outside (external) students which causes stimulation to learn seriously in different ways to achieve the desired goals.

#### **D. There is a Difference in the Effect of Skills between Groups of Students whose Learning Uses the PjBL model and Groups of Students whose Learning Uses the direct instruction method**

Based on the results of the hypothesis 4 test that has been calculated, showing a significance level of  $0.000 < 0.05$ , it can be concluded that the direction of the difference is shown by the average of Skills with the PjBL model and the direct instruction method where the difference is shown by the Economics learning outcomes of students who have high initial abilities and those who have initial abilities low in grade XI students of SMA Negeri 1 Ketapang. There are differences in the skills of students who use the PjBL model with the direct instruction method in grade XI students of SMA Negeri 1 Ketapang.

Based on the results of the above hypothesis test that the PjBL model can improve students' skills, the researcher found the difference in skills between the PjBL model and the direct instruction method and showed a significant number on economic learning outcomes. Dimiyati & Mudjiono (2013) stated that the PjBL model is a learning approach that relates the material learned to the real life of students, both in the family, school, community and citizen environment, with the aim of finding the meaning of the material for their lives.

Based on research conducted at SMA Negeri 1 Ketapang, it shows that the PjBL model naturally seeks the meaning of the context according to the real situation of a person's environment through the search for reasonable and useful relationships.

Through the combination of the material learned with daily experience, students produce the basics of in-depth knowledge. Students are able to use their knowledge to solve new and unprecedented problems by increasing their experience and knowledge. Students can build their knowledge that is applied in daily life by combining the subject matter they have received at school.

According to Trianto (2007:108), contextual learning refers to the theory of constructivist learning, where the contextual learning model emphasizes that learning is not just memorization, recording and listening. However, students must be able to construct (build) knowledge in their own minds from the results of observation and understanding of something that is happening around them. Knowledge must be whole and inseparable. The teaching and learning process is more student-centered than teacher-centered. Most of the time the teaching and learning process takes place based on learning activities for students of SMA Negeri 1 Ketapang.

In this study, the researcher showed that the PjBL model in learning became more meaningful and real. This means that students can capture the relationship between learning experiences at school and real life. This is very important, because by being able to correlate the material found with real life, not only for students the material functions functionally, but the material they learn is closely embedded in the student's memory, so it will not be easily forgotten.

Thus, the researcher concluded that his research conducted at SMA Negeri 1 Ketapang that the PjBL model is a more productive learning and is able to foster the strengthening of concepts to students because of the PjBL model, students are guided to find their own knowledge. Through the philosophical foundation of constructivism, students are expected to learn through experience, not memorization. The PjBL model is not only a place to obtain information, but as a place to test the data of their findings in the field.

The application of the PjBL model in schools provides opportunities for students to do meaningful tasks, providing meaningful experiences to students. This learning is carried out through group work, discussion, and mutual correction between friends by providing opportunities for students to create a sense of togetherness, cooperation, and mutual understanding between each other in depth.

#### **E. Skill Differences between Groups of Students Who Have High Starting Ability and Groups of Students Who Have Low Starting Ability**

Based on the results of the hypothesis 2 test that has been calculated, showing a significance level of  $0.000 < 0.05$ , it can be concluded that there is a difference in the biology learning outcomes of students who have high initial ability and low initial ability in grade XI students of SMA Negeri 1 Ketapang.

Based on the results of research conducted at SMA Negeri 1 Ketapang, it was found that there was a difference in the learning outcomes of Economics students who had high initial abilities and those who had low initial abilities and the researcher showed that: (1) Mastery of the concept of students who had high initial abilities through the PjBL model higher than students with low initial ability. (2) Students' creative thinking ability through the application of the PjBL model is more creative than the direct instruction method. (3) The ability to compile students' concept maps through the application of the PjBL model is more active than the direct instruction method. (4)

Students' mastery of concepts has a strong effect on the ability to solve problems and compile concept maps through the application of the PjBL model compared to the direct instruction method. (5) The learning outcomes or grades obtained by students who have high initial abilities are more prominent and have approached the SKM (Minimum Graduation Standard) of the grades that have been set by the school than those who have low initial ability.

According to Dimiyati & Mudjiono (2013), the high and low initial ability shows the difference in individual tendencies in striving to achieve an achievement. Initial ability is the desire that activates, drives, channels and directs individual attitudes and behaviors to learn. The overall motivation is both from outside and within students by creating a series of efforts to prepare certain conditions that lead to learning activities so that the goals can be achieved.

Thus, the results of the research at SMA Negeri 1 Ketapang, the researcher revealed that early ability determines learning perseverance. Students who have early abilities and high enthusiasm for learning are influenced by several factors, namely encouragement from those around them, high optimism, goals achieved, awards if they get good grades, and more attention from parents. High initial ability can affect student learning outcomes. In the classroom, the researcher found many students who were enthusiastic about learning, paid attention to their teachers, asked a lot of questions in class, had a high sense of curiosity, and took their assignments seriously.

Meanwhile, the low initial ability according to research at SMA Negeri 1 Ketapang can be caused by many factors. These factors are low self-confidence, laziness to learn, lack of concentration, lack of attention from parents, and no one to encourage. Low initial ability can cause students to be lazy to learn so that it can cause students to get low learning outcomes. In the classroom, the researcher found that some students were lazy to study, lazy to do assignments, had no desire to know what other friends were doing, did not care about their teachers, did not care about their grades, and had no sense of enthusiasm in the classroom.

#### **F. Interaction between the Influence of the PjBL model, direct instruction method and Students' initial abilities on Skills**

Based on the results of the hypothesis 3 test that has been calculated, showing a significance level of 0.041 and less than 0.05, it can be concluded that there is an interaction between the PjBL model and the direct instruction method with the initial ability to Skills in grade XI students of SMA Negeri 1 Ketapang.

Based on hypothesis testing using a multivariate analysis formula, it turns out that this third hypothesis is also proven. This makes it clear that using the PjBL model, the direct instruction method and the initial ability to skills together provide a significant interaction on the achievement of economic learning outcomes.

In the research conducted at SMA Negeri 1 Ketapang, it was found that there was a difference in the learning outcomes of students who used the PjBL model with the direct instruction method because the PjBL model was more dominant in interacting with students and was included in the four main principles in the learning process (Trianto, 20071), namely First, interaction process (students actively interact with teachers, peers, multimedia, references, environment). Second, the communication process (students communicate their learning experiences with teachers and other peers



through stories, dialogues). Third, the reflection process, (students rethink about the meaning of what they have learned, and what they have done). Fourth, the exploration process (students experience directly by involving all their senses through observation, experiments, and investigations).

Based on the results of the research, the researcher revealed that using the PjBL model that must be considered is understanding the characteristics of students, getting to know students individually, utilizing student behavior in organizing learning, developing critical thinking, creativity, and problem-solving skills, developing the classroom as an interesting learning environment, Utilizing the environment as a source of learning, providing good feedback to improve learning activities, distinguishing between physically active and mentally active.

For the direct instruction method in the research applied at SMA Negeri 1 Ketapang, the researcher showed that there was no good interaction from the direct instruction method, only that students knew and memorized the subject matter. In the selection of information or materials in the classroom is based on the needs of students, even though in the classroom the level of students' abilities is different so that researchers will have difficulty in determining the subject matter because the level of achievement is not the same. The learning process with the direct instruction method appears clear between students who have high abilities and poor abilities, which then causes inconfidence for students who lack ability.

The researcher pointed out his research that there are often difficulties in keeping students interested in what they are learning, teaching activities become verbalism. Students who are more responsive from the visual side will be a loss and students who are more auditory can receive it more. It is boring for too long and students are passive, and it is difficult to control the extent of students' learning achievement

Thus, in this study, it can be said that the interaction between the PjBL model, with the direct instruction method and the initial ability to Skills can cause stimulation both from within (internally) and from outside (external) students which causes stimulation to learn seriously in different ways to achieve the desired goals.

## CONCLUSION

Based on the results of the research and discussion that have been described, it can be concluded as follows: (1) There is a difference in the knowledge of students who use the PjBL model and the direct instruction method in grade XI students of SMA Negeri 1 Ketapang, (2) There is a difference in the knowledge of students who have high initial abilities and those who have initial abilities low in grade XI students of SMA Negeri 1 Ketapang, (3) There is an interaction between the PjBL model and the direct instruction method with the initial ability to Knowledge in grade XI students of SMA Negeri 1 Ketapang, (4) There is a difference in the skills of students who use the PjBL model and the direct instruction method in grade XI students of SMA Negeri 1 Ketapang, (5) There is a difference in the skills of students who have high initial ability and those who have low initial ability in grade XI students of SMA Negeri 1 Ketapang, and (6) There is an interaction between the PjBL model and the direct instruction method with initial ability to Skills in grade XI students of SMA Negeri 1 Ketapang.

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