Original Article

e-ISSN: 2721-7175 p-ISSN: 2089-2341

Character education facing the vuca era through the PJBL model in penjas subjects

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Authors' Contribution: A – Study Design, B – Data Collection, C – Statistical Analysis, D – Manuscript Preparation, E – Funds Collection

Abstract: The aim of this research is to find out: differences between the learning model and Interest in learning in the Character Education of PENJAS Subjects. This experimental research was carried out using a 2x2 factorial design. The subjects in this research were class VIII students consisting of four classes with 110 group B students at the Insan Scholar Kindergarten. The subjects that were the focus of the experiment were taken at random, namely group B of the Insan Scholar Kindergarten. This research hypothesis was tested using the Analysis of Variant (Anova) statistical test. The calculation results show that: Based on the results of hypothesis testing and discussion, it can be concluded as follows: (1) There is a difference in the influence of using Project-Based Learning and conventional methods on Character Education in PENJAS Subjects, (2) There is a difference in the influence of high interest in learning and low interest in learning on character education in PENJAS subjects, and (3) There is an interaction effect between the learning model and interest in learning on the character education of the PENJAS subject.
Keywords: Character Education, VUCA, PjBL Model, PENJAS Subjects

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Recevied: 2024-06-11; Accepted: 2024-12-30; Published online: 2024-12-31

INTRODUCTION

Educational contributions are very important for students. In education, students have the opportunity to actively develop their potential and competencies so that they have spiritual intelligence, emotional intelligence, personality, noble character, and are skilled in various things needed for themselves, society, nation and state. In order for education to be truly functional so that it can realize the things that have been stated, the education provided must be truly adaptive to current developments. As mandated in (Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, 2003) which states that the national education system must be able to guarantee equal distribution of educational opportunities, improve the quality and relevance and efficiency of education management to face challenges in accordance with the changing demands of local life, national and global.

Various things are facing education now. Fast-moving technological developments, unstoppable flow of information, natural disasters, pandemics and global warming are part of the things faced by the Indonesian nation which have an impact on society, as stated (Afkarina et al., 2023; Guo et al., 2023; Woltés & Fernández-Mesa, 2023) that technology has entered and is applied in all elements of life so it is no longer foreign to humans. The application of technology has positive and negative impacts on human life. This creates Volatility, Uncertainty, Complexity, Ambiguity (VUCA), namely situations and conditions of change that occur very quickly, uncertainly, complexly and ambiguously in various areas of life, including education (Bömelburg & Gassmann, 2024; Fuentealba et al., 2023; Main, 2023) .

These realistic conditions of course require anticipation and solutions. The government is trying to make various efforts, including adapting the curriculum to the demands of Human Resources in the XXI Century, Freedom of Learning. Likewise with Physical Education learning. Physical education learning as a form of realization of education plays a role in overcoming and finding solutions to various problems in education, especially education in the VUCA era.

Physical education learning is a system. This means that the success of Physical Education learning depends on the learning components involved in it. Learning components include students, lecturers, learning objectives, learning materials, learning models, learning media, learning evaluation, and so on. Thus, the solution to the phenomenon currently being faced by education which has been described previously is of course related to the various components in the learning system that determine the success of learning. Therefore, one solution to educational problems is to analyze each component in Physical Education learning.

Among the learning components, the learning model is a component that contributes greatly to learning because when the learning model is used all the other components are integrated into the model used.

The learning model required by the current Curriculum, namely the 2013 Curriculum, is a model that can create a learning process by emphasizing meaningful student activities. The essence of active students is that students experience an efficient and effective learning process mentally and experientially (Gunawan, 2024; Rahma & Anggreani, 2024) . Apart from that, the model chosen by lecturers should be a 21st century learning model with new orientations in building competence with the main approach being student center learning and a constructivist learning paradigm with lecturers remaining active (Altatri Adelisha, 2024; Anwar et al., 2024; Lailatussaadah et al., 2024) .

One model that is assumed to be able to realize learning that meets demands based on the phenomena faced in the VUCA era is the Project Based Learning (PjBL) model. This is in line with the characteristics of PjBL that PjBL is a pedagogical approach that allows students to learn while being actively involved with meaningful problems (Afrilianto et al., 2022; Sari & Faizin, 2023; Sinaga et al., 2022) . Students are given the opportunity to solve problems in a collaborative environment, create mental models for learning, and form independent learning habits through practice and reflection (Affandi, 2024; Namira et al., 2024; Simarmata et al., 2024) . Research studies that discuss Character Education Facing the VUCA Era Through the PjBL Model have been widely conducted, but each target or research location has different problems, research conducted by (Syamsuri & Bur, 2023)The Role of Indonesian Language and Literature Learning in Forming Character in the VUCA Era, but in this study the problems are similar. about the lack of Character Education Facing the VUCA Era Through the PjBL Model in PENJAS Subjects. This requires Character Education Facing the VUCA Era Through the PjBL Model to vary. For this reason, this study focuses more on how to apply Character Education Facing the VUCA Era Through the PjBL Model in PENJAS Subjects. Thus, this study aims to ensure that the application of Character Education Facing the VUCA Era Through the PjBL Model in PENJAS Subjects can be developed according to needs Through students' learning interests in learning activities so that more active and effective learning is created. In addition, this research is expected to help improve Character Education in this learning.

The research that has been conducted shows that the PjBL model can not only improve student knowledge and skills, but also student attitudes. Thus, the use of PjBL in Physical

Education learning in the VUCA era is assumed to be a solution to the problems that occurred in that era which was more demanding on student character formation.

MATERIAL AND METHODS

This study uses an experimental research method. The experimental method is defined as a method with a systematic form with the aim of finding the influence of one variable on another variable by providing special treatment and strict control in a condition. The research design used is a pre- experimental one group pre-test- posttest design. This design involves one group that is given a pre-test (O), given treatment (X) and given a post-test. The success of the treatment is determined by comparing the pre-test and post-test values.

In the one group pre-test-post-test pre-experimental study, the first stage carried out was to determine the sample to be used as a research sample and group it into one research class. The next stage was to provide a pre-test to measure the condition of students' learning interest before being given treatment using the PjBL Model. The next stage was that the sample was given treatment using the PjBL Model. Then, the last stage was that the sample was given a post-test to measure the condition of interest in learning the PENJAS Subject after being given the PjBL Model treatment. The purpose of using the PjBL Model in the PENJAS Subject is to determine the effect of Character Education Facing the VUCA Era Through the PjBL Model and learning interest towards learning outcomes of PENJAS Subject. The design of this study will be presented in table 1

Table 1. One group pre-test post-test design

O_1	X	O_2

Information:

O1 : Pre-test
O2 : Post Test
X : treatment

This experimental procedure was carried out with the following steps:

1. Preparation stage, includes:
   a. Research design
   b. Literature study
   c. Creation of learning media and research instruments.
   d. Validation of learning media and research instruments.
2. Research implementation stages, including:
   a. Grouping samples into one research class.
   b. Conduct a pre-test to determine the condition of students' learning motivation.
   c. The Use of the PjBL Model in PENJAS Subjects . The Process of Using the PjBL Model are as follows: (1) conditioning of the research classroom, (2) opening of learning, carried

out by the subject teacher, (3) a brief explanation of the PjBL Model in the PENJAS Subject by the researcher; (4) application of the PjBL Model in the PENJA S Subject , (5) Providing a post-test to determine the condition of students' learning interest after being given treatment with the PjBL Model .

3. Data processing and analysis
4. Summarize the research results

The research procedure above is arranged with a systematic flow. The explanation of the procedure above can be seen in Figure 1.

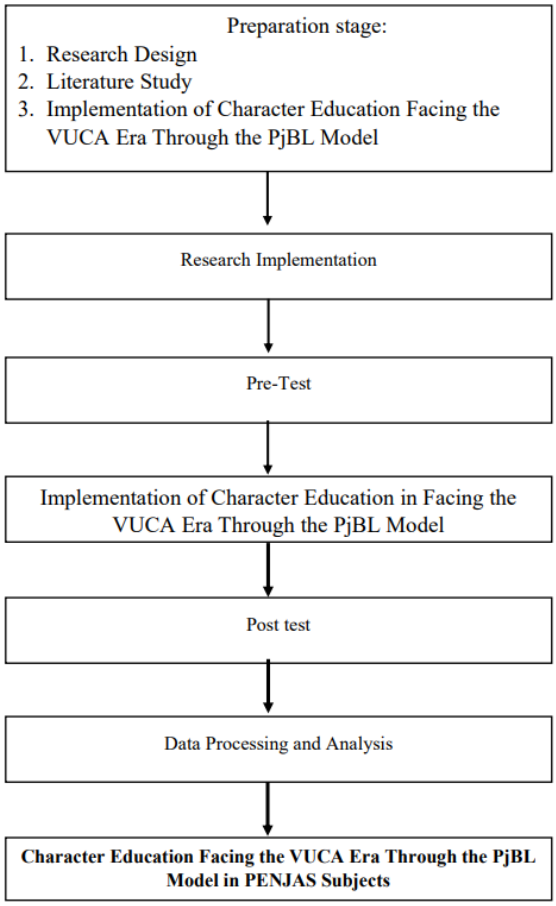

Figure 1. Research Procedure

This type of research is quantitative with a *quasi-experimental design type.* Experimental research has three variables, namely the independent variable, *the* dependent variable *and* the moderator variable.

Table 2. Research Design

Strategy (A)	**Interest Level (B)**	
	Interest (B1)	Interest (B2)
PjBL model ($A_{1)}$)	(A_1B_1)	(A_1B_2)
Conventional Method ($A_{2)}$)	(A_2B_2)	(A_2B_2)

This research design is shown by a metric table consisting of 4 cells, generally written as metric A for learning strategies. and metric B as Learning interest. In this case the metric (A1) is the PjBL Model and (A2) is the Expository learning method. For matrix (B1) the interest in learning is high and while (B2) the interest in learning is low. The level of interest in learning is high if the student gets a score above the median score, while the score is the same or below the median in the group at the level of low interest in learning.

Sugiyono, (2019) states that the population is the entire object of research, while according to (Sugiyono, 2019) Population is a generalized area consisting of: objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then recycled. The population is divided into two, namely the general population and the target population. The general population is state junior high school students in Surabaya consisting of 4 classes.

Table 3 Research Samples

No.	School name	Population	Sample	Peng Technique. Sample
1.	State Middle School in Surabaya	140	140	Random Sampling
	Amount	140	140	

For Public Middle Schools in Surabaya, it consists of 2 classes with different learning, group B 1 and group B 2 with the PjBL model and group B 3 and group B 4 with the conventional method.

Population. This means that the larger the sample used, the more likely it is to be a *representative example* of the population, the data is more accurate and more precise. This research took a sample of two classes totaling 55 students. In this research, the sampling method used was the *Random Sampling technique. Random Sampling* Technique is a sampling technique by randomizing groups, not individual subjects. Sugiyono, (2019), Each member in the cluster taken at random is the required sample (Sugiyono, 2019) .

The data collection techniques that researchers use is: (1) Observation, (2) Questionnaires, and (3) Tests. Before carrying out data analysis with quantitative correlation using multiple linear regression analysis techniques, several prerequisite tests must be carried out, namely the Normality test, homogeneity test, while to test the hypothesis using SPSS series 25 for Windows software. Before carrying out the multiple linear regression test, prerequisite tests are first carried out, namely the Normality test and homogeneity test as conditions for research to be carried out.

RESULTS

In the section below we will discuss hypothesis testing regarding differences in student learning outcomes based on their level of learning interest, namely low and high levels of learning interest. Then it will also be explained about student learning outcomes which are reviewed based on the model used, namely the PjBL Model with conventional methods (see Figure 2) and finally, the interaction pattern between two factors will be tested, namely the joint influence between the learning model used and the level of interest. students' learning about Character Education in the PENJAS subject

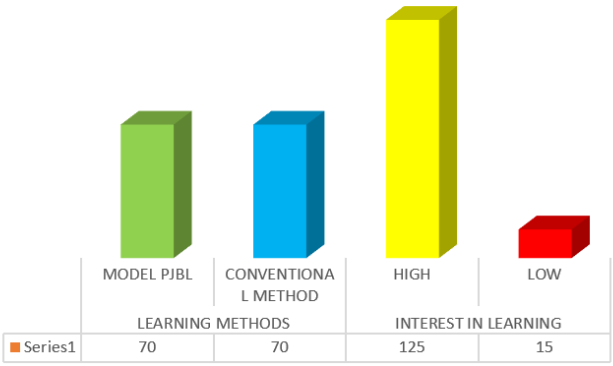

Figure 2. Data on differences between PjBL models and interest in learning

Learning Results using Learning Interest in Figure 2 above, the test results of student learning interest data are displayed using a low learning interest level and a high learning interest level. For data on student learning outcomes using the low learning interest level, there were 15 students, while the high learning interest level was 125 students.

Overall descriptive statistical data regarding learning methods, interest in learning, and character education for PENJAS subjects can be seen in the following table 3.

Table 3. Descriptive Statistics

Descriptive Statistics

Dependent Variable: LEARNING OUTCOMES OF CHARACTER EDUCATION

LEARNING METHODS	INTEREST IN LEARNING	Mean	Std. Deviation	N
MODEL PjBL	HIGH	76.5873	4.29041	63
	LOW	80.0000	.00000	7
	Total	76.9286	4.19565	70
CONVENTIONAL METHOD	HIGH	61.2258	2.03590	62
	LOW	51.8750	2.64237	8
	Total	60.1571	3.65401	70
Total	HIGH	68.9680	8.40884	125
	LOW	65.0000	14.64338	15
	Total	68.5429	9.28399	140

Statistical data from the results of SPSS 25 calculations between learning methods, learning interests, and learning outcomes with a total of 120 students obtained the following results: (1) Character Education for PENJAS Subjects on the PjBL Model obtained an average *(mean)* of 76.9286 and standard deviation 4.19565. Meanwhile, the conventional method obtained an average *(mean)* of 60.1571 and a standard deviation of 3.65401, and (2) High learning interest in the PjBL Model obtained N: 63 and low learning interest obtained N: 7. Meanwhile, high interest in learning in the conventional method was obtained at N.62 and low interest in learning was obtained at N: 8.

This research hypothesis was tested using two-way analysis of variance. Researchers used SPSS 25 to calculate the two-way analysis of variance test. In SPSS 25, hypothesis testing is obtained from the results of *Tests of Between-Subjects Effects.* From *the print* out In detail, we can find out the results of hypothesis tests 1, 2 and 3. A summary of the calculation results can be presented in the following table 4.

Table 4. Summary of Two-Way Variance Analysis Calculation Results

Tests of Between-Subjects Effects

Dependent Variable: LEARNING OUTCOMES OF CHARACTER EDUCATION

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10537.759[a]	3	3512.586	331.058	.000
Intercept	242552.764	1	242552.764	22860.396	.000
METHODES	6306.544	1	6306.544	594.387	.000
INTEREST_LEARNING	117.592	1	117.592	11.083	.001
METHODES * INTEREST_LEARNING	543.279	1	543.279	51.204	.000
Error	1442.984	136	10.610		
Total	669718.000	140			
Corrected Total	11980.743	139			

a. R Squared = .880 (Adjusted R Squared = .877)

Data analysis to test hypotheses 1, 2 and 3 is as follows.

Calculating the SPSS 25 results for interest in learning obtained a significance value of 0.000 and the value of 0.001 is less than 0.05, so it can be concluded that Ho is rejected and Ha is accepted. This means that there is a significant influence on character education in the PENJAS subject between students who have high interest in learning and students who have low interest in learning.

The results of calculating the interaction between learning methods and interest in learning using SPSS 25 obtained a significance value of 0.000 and the value of 0.000 is less than

0.05, so it can be concluded that Ho is rejected and Ha is accepted. Which means that there is a significant interaction of use PjBL model and conventional method with Interest in learning about Character Education for Physical Education Subjects.

The results of the three hypothesis tests carried out using SPSS 25, all the hypotheses proposed in this study were proven, because the results of the data analysis showed significant numbers. A significant result is that there is an interaction between the application of the PjBL Model and the conventional method Interest in learning about Character Education in the PENJAS subject is also strengthened by Figure 3, as follows:

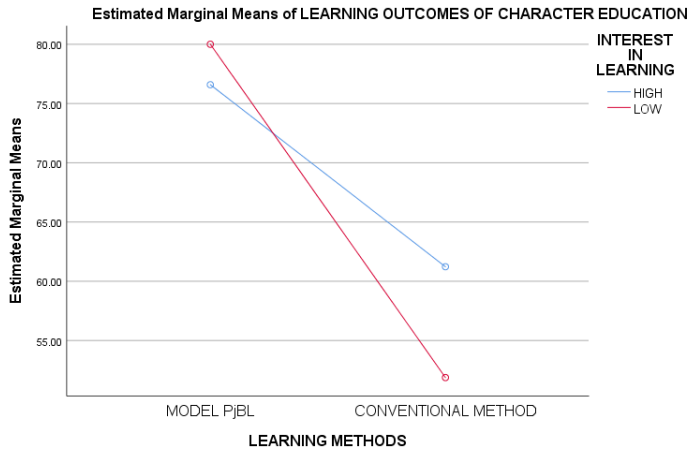

Figure 1. PjBL Model Interaction and Interest in learning

Figure 3 shows that there is a converging line or intersection of data on Character Education for Physical Education Subjects between low and high interest in learning in the control group (Conventional method) and the PjBL Model experimental group.

DISCUSSION

A. Discussion and discussion of the first hypothesis

The first hypothesis of this thesis states that there is a difference in the Character Education of Physical Education Subjects between those using the PjBL Model and those using the Conventional method, then a statistical test is carried out. From the results of statistical analysis using two-way SPSS ANOVA, it was found that the calculated F value was 24.858 and the probability of 0.000 was smaller than the real level of 0.05 so that Ho was rejected, so there was a difference in the Character Education of PE Subjects between those taught using the PjBL Model and those taught using Conventional method.

Differences in character education for PE and PE subjects between those taught using the PjBL model and those taught using conventional methods This is because learning with the

PjBL Model is a way of mastering learning materials through developing students' imagination and appreciation. Students develop imagination and appreciation by acting as living characters or inanimate objects. This method involves a lot of students and makes students enjoy learning and this method has added value, namely: a) it can guarantee the participation of all students and provide equal opportunities to demonstrate their ability to work together to achieve success, and b) the game is a fun experience for students (Budiarti et al., 2023; Nurjanah et al., 2023 ;

Play is often associated with children's activities that are carried out spontaneously and in a happy atmosphere. By playing in groups, children will have an assessment of themselves regarding their strengths so that they can help form a positive self-concept, good emotional management, have a high sense of empathy, have good self-control, and have a high sense of responsibility. Seeing the great benefits of play for children's lives, innovations can be made using play as a learning method. Because playing can help students understand the subject matter more deeply by playing games about the subject matter presented. The learning innovation that has been carried out is known as the role-playing learning method or PjBL Model (Andika & Anwar, 2023; Nur Sopa et al., 2023; Rico Ardiansyah et al., 2023) .

B. Discussion and Discussion of the Second Hypothesis

The second hypothesis of this thesis states that there is a difference in the Character Education of Physical Education Subjects between those who have high interest in learning and those who have low interest in learning.

From the results of statistical analysis using two-way ANOVA in SPSS, it was found that the calculated F value was 231.698 and the probability of 0.000 was smaller than the real level of 0.05 so that Ho was rejected, so there was a difference in the Character Education of Physical Education Subjects between those who had an interest in learning and those who had an interest in learning. low. The group of students with high interest in learning has a better average score for Character Education in PENJAS subjects than the group of students with low interest in learning. This difference is because interest in learning is closely related to ability, so people say there is ability contained in the person of someone who is full of interest.

The difference in character education for PES subjects between those who have a high interest in learning and those who have a low interest in learning is because interest in learning is a driving or pulling force that causes behavior towards a certain goal. With interest in learning, there will be an urge to do something in relation to achieving goals. A person will do

something if he has a goal for his actions, and because there is a clear goal, there will be an urge to achieve it. Interest in learning will cause a change in the energy that exists in humans, both regarding the soul, feelings and emotions, so that they then act or do something to achieve the goal (Aulia et al., 2021; Fadilla et al., 2020; Khairiyah & Fernandes, 2021) .

Interest in learning is one of the factors that can improve the quality of learning, because students will study seriously if they have a high interest in learning. Every teacher should be curious about why and how children learn and adapt themselves to the learning conditions in their environment. This will increase the teacher's understanding and insight, thereby enabling the learning process to take place more effectively and optimally, because knowledge about children's psychology related to educational problems can be used as a basis for learning so that students are willing and able to learn as well as possible.

To achieve success in the learning process, the interest in learning factor is the main key. A teacher must know exactly why a student has various motives in learning. There are four categories that a good teacher needs to know related to interest in learning "why students learn" (Fathuroji et al., 2021; Sembiring et al., 2023; Ubaidi A, Rifa Nabila, 2023), namely (1) Interest in learning intrinsic (students learn because they are interested in the tasks given), (2) instrumental learning interest (students learn because they will receive consequences: reward or punishment), (3) social learning interest (students learn because their ideas and ideas want to be appreciated), and (4) Interest in learning (students learn because they want to show others that they are capable of carrying out the tasks given by their teacher). Interest in learning can be interpreted as the driving force that exists within a person to carry out certain activities in order to achieve a goal, namely success in learning. Even interest in learning can be interpreted as an internal condition (preparedness).

Interest is a change in energy within a person which is marked by the emergence of a " feeling " and is preceded by a response to a goal. From this definition, there are three main elements/characteristics of interest in learning, namely that interest initiates changes in energy, is characterized by feelings, and is stimulated by a goal. However, in essence, interest is a psychological condition that encourages someone to do something. In learning activities, interest can be said to be the overall driving force within students which gives rise to, ensures continuity and provides direction to learning activities, so that it is hoped that goals can be achieved. In learning activities, interest is very necessary, because someone who does not have interest in learning will not be able to carry out learning activities. There are two interests,

namely Intrinsic Interest and Extrinsic Interest (Hermawan et al., 2020; Irkhamni et al., 2021; Sagala, 2023) . (a) Intrinsic Interest. This type of interest arises from within the individual himself without any coercion from other people, but based on his own will. (b) Extrinsic Interest. This type of interest arises as a result of influence from outside the individual, whether due to invitations, orders, or coercion from other people so that under these circumstances students want to do something or learn. For students who always pay attention to the lesson material provided, it is not a problem for the teacher. Because within the student there is interest, namely intrinsic interest. Such students usually consciously pay attention to the teacher's explanation. They are more curious about the subject matter provided. The various distractions around him are less able to influence him to distract him. It's different for students who have no interest within themselves, so extrinsic interest, which is encouragement from outside themselves, is absolutely necessary. Here the teacher's task is to arouse students' interest so that they want to learn.

C. Discussion and Discussion of the Third Hypothesis

The third hypothesis of this thesis states that there is an interaction between the use of learning methods and interest in learning about character education in PE subjects, then a statistical test is carried out. From the results of statistical analysis using two-way ANOVA in SPSS, it was found that the calculated F value was 18.017 and the probability of 0.000 was smaller than the real level of 0.05 so that Ho was rejected, so there was an interaction between the use of learning methods and interest in learning towards Character Education in PE Subjects.

This interaction is because there are many factors that influence the character education of students in PENJAS subjects. Character Education in PENJAS subjects can be interpreted as the results achieved by individuals after experiencing a learning process within a certain period of time. Character Education in PENJAS subjects is also defined as the maximum ability achieved by a person in an endeavor that produces knowledge or skill values (Salamah et al., 2022; Widiasih & Suanthara, 2022; Wijaya et al., 2020) . Character Education in PENJAS subjects can also be called actual skills *that* a person obtains after studying, potential skills, namely basic abilities in the form of dispositions possessed by individuals to achieve achievement. These actual skills and potential skills can be put into a more general term, namely ability (Arifuddin et al., 2022; Dewi et al., 2019; Istiningsih & Dharma, 2024) .

From the definition above, it can be concluded that Character Education in the PENJAS Subject can be interpreted as the results achieved by students after the students concerned are meant in this research as actual skills, not potential skills. Student achievement in subjects is influenced by factors within the students who are studying which include IQ, interests, talents, health and external factors of students who are studying which include teachers, teaching materials, exercises, facilities for student learning, place at school or at home and in the student's social environment (Asih & Nisa, 2024; Astutik et al., 2021; Suartama et al., 2023) .

Character Education for Physical Education Subjects is a term to indicate an achievement of a level of success regarding a goal because an effort has been made by someone (Ghaffar, 2024; Muchtar et al., 2024; Yefrizon, 2024) . Character Education in PENJAS subjects is an achievement that shows the level of success a person has achieved because they have made optimal learning efforts. Based on the description above, Character Education for PENJAS subjects in this research is the results achieved by students after learning activities. Measuring the results achieved after the learning process is through evaluation using good quality measuring instruments. The measuring tool is an achievement test which refers to the cognitive domain in written form. Based on the research findings above, it can be said that there are many factors that influence the character education of students in PENJAS subjects. However, this research is only limited to interest in learning and learning with the PjBL model and methods Conventional. Because of this, it is necessary to reveal again whether students who have a high interest in learning will have high character education in PENJAS subjects, and students who have high interest in learning and learning using the PjBL model will also have high character education in PENJAS subjects.

From the research results, it can be seen that the average score of students who have a high interest in learning in learning with the PjBL model is 84.70. The average score of students who have high interest in learning in learning using conventional methods is 75.36. The average score of students who have low interest in learning in learning with the PjBL Model is 65.00. The average score of students who have low interest in learning in learning using conventional methods is 64.25. The average score of students who have a high interest in learning is 80.41. The average score of students who have low interest in learning is 64.58. The average student score learning with the PjBL Model is 75.00. The average student score for learning using the conventional method is 68.82. The overall average student score was 71.84.

From the table above, it can be seen that the average score of students in the learning treatment using the PjBL model is better than the average score of students in the learning treatment using the conventional method, both in the group of students who have high interest in learning and the group of students who have low interest in learning. . So learning using the PjBL Model is expected to provide better Character Education for PENJAS Subjects. Meanwhile, the average score of students who have a high interest in learning in learning using conventional methods is 75.36. The average score of students who have low interest in learning in learning with the PjBL Model is 65.00. So for students with high interest in learning, learning using the conventional method provides better results than students who are interested in learning using the PjBL model. So for students who have a high interest in learning, learning using conventional methods is sufficient, but for students who have a low interest in learning, they need to use the PjBL model.

CONCLUSION

Based on the results of hypothesis testing and discussion, it can be concluded as follows: (1) There is a difference in the influence of using Project-Based Learning and conventional methods on Character Education in PENJAS Subjects, namely that students who use Project-Based Learning are better at PENJAS Subjects than students who use conventional method, (2) There is a difference in the influence of high interest in learning and low interest in learning on character education in PENJAS subjects, namely students with high interest in learning are better in PENJAS subjects than students with low interest in learning, and (3) There is an interaction effect between learning model and interest in learning towards character education in PE subjects, in this case interest as a moderator variable really supports the strong relationship between the independent variable and the dependent variable. The effect of using project-based learning with high interest can improve PENJAS subjects

Acknowledgments: Thank Support for Team and Universitas PGRI Adi Buana Surabaya
Conflicts of Interest: "The authors declare no conflict of interest."

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