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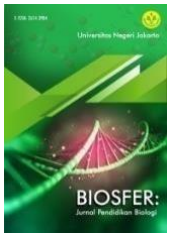

Implementation of PjBL using unila's moodle v-class and its interaction of students' intrinsic factors

Dina Maulina[1*], Nadya Meriza[1], Ismi Rakhmawati[1], Median Agus Priadi[1], Ismu Sukamto[2]

[1] Biology Education, Faculty of Teacher Training and Education, Universitas Lampung, Indonesia
[2] Departemen of Elementary School, Faculty of Teacher Training and Education, Universitas Lampung, Indonesia

*Corresponding author: dina.maulina@fkip.unila.ac.id

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A B S T R A C T

The Main Performance Indicators (IKU) of Higher Education, it has been a mandate the implementation of learning that aims to build and create collaborative and participatory classes. The purpose of this study was aims to analysis the linearity between the implementation of PjBL-based learning using Unila's Moodle v-class with students' intrinsic factors in learning Animal Structure during online learning in realizing collaborative and participatory classes. This research is an experimental-research with posttest-only control design with the population in this study are students of biology education at the University of Lampung, amounting to 371 people. The sample was obtained using purposive sampling technique, as much as 124 students who had taken the Animal Structure course. The results showed that there was a significant difference ($p<0.05$) in student learning outcomes in the control and experimental classes. Nevertheless, there was no influence of intrinsic factors on PjBL results in both classes ($p<0.05$), all students had high intrinsic factors to take part in online learning is high, however the optimizing learning outcomes is not linear.

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INTRODUCTION

Learning development in University is directed to produce competent graduates who are all set to become part of the Industrial revolution 4.0 society. Teacher training programs spearhead educated human resources competencies (Hernawati et al., 2020). Biology Education at the University of Lampung is a program that prepares the availability of human resources in accordance with the achievement of KKNI level 6. This achievement can be done through aligning learning activities with the trends of 21st century needs, preparing competencies from human resources with emphasis on aspects: (1) of knowledge and skills of technology, media, and information; (2) learning and innovation; (3) life and career.The formulation of the learning achievement is reflected upona nation's ideals in order to realize a self-sufficient country by having qualified human resources (Ali et al., 2020).

The 21st-century is characterized by the use of technology and communication in all fields of life, including in the learning process thus becoming a synergistic innovation breakthrough in interdisciplinary learning (Hujjatusnaini et al., 2022). It is an important note that the use of information and communication technology in education is an aspect that determines the speed and success of science (Ali et al., 2020). The development of the 21st century is also marked by many (1) information that are available and accessible at any time; (2) faster computing; (3) automation that replaces routine jobs; and (4) communication that can be done from anywhere and anywhere (Prokopowicz & Gołębiowska, 2021). The expected achievements in the application of 21st-century learning become the basis for the development of achievements in the learning system and process at the higher education level which is directed at the achievement of graduate competencies 6C for HOTS (Communication, Collaboration, Compassion, Critical Thinking, Creative Thinking, Computation logic), Adaptive, Flexible, Leadership, Reading Skill, Writing skill, dan Information Technology Skills (Tang et al., 2020).

The formulation of the reflection on the learning process is stated in Permendikbud No. 49 of 2014 concerning National Standards for Higher Education which are learning must have the characteristics of contextual and student-centered (Education & Standards, 2014). Contextual learning can be achieved through a learning process that is adapted to the demands of the ability to solve problems in the realm of expertise. The focus on the learning process, especially in the field of biology, is the effort of educators in contextualizing lecture material into interesting learning offerings, easy to understand and use as solutions to real-life problem (Maulina et al., 2020). Biology learning, especially in animal structure lectures, the truth lies in empirical evidence. Therefore, observation through practical activities is an alternative to understand, prove and reveal the observed facts. Animal Structure is a compulsory subject in the biology education study program, the University of Lampung which is supported by laboratory activities to prove the truth of science in building contextual learning. The target achieved from this form of contextual learning is to facilitate the thinking (mindset) and understanding of students about the usefulness of learning Animal Structures in achieving Learning Outcomes at Indonesian National Qualification Framework (KKNI) at Level 6 (KKNI, 2015).

Base on observation, facts show that in 2019/2020 odd semesters in online learning the results of studying the Animal Structure course were only 77% of students who passed according to the Course Learning Achievement/ CPMK. It is suspected that the low learning mastery during the learning process in the Animal Structure course has not been able to contextualize the learning material with real life and the realization of online lectures is not achieved. The implementation of the practicum was shifted to the search for literacy from various sources, which became an obstacle in understanding the material. Previous research revealed that students' difficulties in finding learning resources had an impact on students' low understanding (Maulina & Amin, 2016). The low student learning outcomes result in reflection on learning in the Animal Structure course, one way to overcome the problem of contextualizing learning which requires a comprehensive (holistic), integrative and scientific understanding following the Minister of Research, Technology and Higher Education Regulation No. 44 of 2015 article 11 to obtain a form of learning and valuable and meaningful learning experiences for students (Technology, 2015).

The use of technology is a requirement in learning activities. Various media, discussion rooms, and information acquisition with online services are a means of accelerating and facilitating the acquisition of contemporary knowledge. Ownership of gadgets for every learner can be used appropriately and correctly as a form of digital literacy acquisition. Lecturers are obliged to provide direction and guidance in learning activities so that the use of ICT media is effective. Therefore, the integration of ICT in learning activities as a medium for discussion rooms and online tests is something that needs to be implemented.

The University of Lampung in carrying out online learning activities provides lecture facilities using Moodle V-Class, University of Lampung (Riyantika et al., 2021; Saputra & Rahmawati, 2022).

The observations through questionnaires, students taking the Animal Structure course revealed that scientific content in animal structure lectures is considered abstract, therefore media is needed to be able to contextualize and visualize lecture material, which can be done through practical work steps. This incidental implementation has an impact on the regulation of the implementation of learning in higher education in particular. In response to this, one thing that needs to be strengthened in learning is technology readiness (IT). Technology is a requirement and benchmark in the implementation of online learning (Hermann et al., 2015) and one of the absolute things that must be met in every educational unit in the implementation of online learning (Gani, 2014) as long as the policy is set. The alternative that must be available is learning with the help of the Moodle application (Modular Object-Oriented Dynamic Learning Environment) in the form of a Learning Management System (LMS) which is accommodated from each university and or which is available for free online. Problems and phenomena that arise from learning are that every learning that uses technology applications requires the availability of devices in the form of computers, gadgets, internet access, and adequate quotas (Azzahra et al., 2022). This is one of the factors of obstacles and problems in parts of Indonesia that have a variety of geographical, cultural, and socio-economic backgrounds.

The implementation of online learning specifically when it is implemented in science learning will be the main topic of study and how are the ideal conditions for learning science online (Maulina et al., 2021). The nature of science learning, proof, and truth in a field of scientific study is proven based on the observed facts obtained through the results of real empirical data that are contextual in nature (Maulina et al., 2020). Accordingly, observation activities are an alternative to understanding, proving, and revealing existing scientific facts, one of which is through practicum activities and other forms of performance observation (Likita et al., 2020). Laboratory activities to prove science is a form of real learning that can be adopted for the development of contextual learning in the classroom (Rahmawati et al., 2019). However, government policies to implement laboratory-based learning, and observing nature through online learning are difficult to implement. Therefore, it is necessary to make alternative efforts to overcome this. Lecturers at universities are required to be able to design online science learning by considering the achievements of each subject and the expected graduate competencies in the curriculum.

In the Main Performance Indicators (IKU) of Higher Education (Direktorat Jenderal Pendidikan Tinggi, 2021), there is a mandate in carrying out the implementation of learning that aims to build and create collaborative and participatory classes. Collaborative and participatory in its implementation and development is to create qualified learning classes by involving students and stimulating their involvement in the learning process in online/virtual classes. The implication is that learning can be carried out with the criteria of learning methods using project-based group learning. Many studies explain that collaborative learning is quite effective in improving student learning processes. Bedard (Bédard et al., 2012) explained that collaborative learning means learning in group work and not learning in isolation. In this collaborative learning, students are responsible for their learning process and try to find information to answer the questions that are presented to them (Hernawati et al., 2020). The use of online discussion rooms, blended learning, and media test educational games through Quizizz can be used as an alternative in improving students' cognitive, psychographic and affective learning outcomes (Tang et al., 2020). Currently, online learning functions more as a substitute, because this pandemic emergency requires students to have the ability and independence in managing themselves and learning activities during the learning process from home. This process creates a new paradigm, in which educators act more as "facilitators" while students act as "active participants". Educators are required to create better and more interesting techniques and teaching materials, while students are required to actively participate in the learning process.

Animal Structure lectures, the learning process occurs both theoretically and practically. The problem encountered by several science educators is the difficulty in implementing practical online learning processes because practicum is usually carried out in a laboratory setting. In a practicum setting in a structured and tightly controlled laboratory, it will be difficult to create activities that create a sense of autonomy in students (Hernawati et al., 2020). The implementation of Project-Based Learning with the implementation of independent practicums based on the use of Lampung animal local wisdom

resources is one of the learning activities implemented in online learning through the V-Class Unila class by providing easy accessibility in student virtual meeting rooms and synchronous discussion rooms.
In addition to external problems experienced by students, some problems are internal to students. How is the student's intrinsic factor for learning success that requires intrinsic reinforcement (Maulina et al., 2022). The phenomenon of online learning has an impact on students' self-will in carrying out learning. Emotional involvement in the online learning process provides a significant response and progress to learning outcomes. Many previous studies have revealed the advantages and disadvantages of implementing online learning (Maulina et al., 2021). The previous study showed that there had been a significant effect on PjBL with students' intrinsic factors. The fundamental elements of PjBL are well suited to stimulate soft skill development and produce intrinsic motivation in participants (Davis, 2016). Efforts to improve LMS-based online learning, the effectiveness of technology-based models and methods as well as the weaknesses and constraints of online learning, especially on the problems of network constraints and high financing. However, more than that, the main root of the problem faced by students as individuals are how the psychological impact and willingness to carry out online learning that is carried out independently so that they can enjoy a fun learning process and understand a material concept. This research proves that technology based on strengthening students' understanding through PjBL will be a benchmark for the success of online learning with a focus on the achievement of competence in biology learning materials that pays attention to students' intrinsic strengthening. Thus, the purpose of this study was to learning using Unila's Moodle v-class with students' intrinsic factors in learning Animal Structure during online learning in realizing collaborative and participatory classes.

METHODS

Research Design

This research was an experimental study with Posttest-Only Control Design (Table 1). This study has independent and dependent variables. The independent variables were the Project-Based Learning model and student intrinsic factors. The dependent variable in this study is the student's cognitive learning outcomes in animal structure lectures. The research was carried out in the odd semester of the 2021/2022 academic year from June to December 2021.

Table 1
Posttest-Only Control Design

Group	Treatment	Posttest
Experiment Group: Student Supporting Animal Structure course for the 2021/2022 academic year	Project-Based Learning using V Class Unila	Post-test score
Control Group: Student Supporting Animal Structure course for the 2020/2021 academic year	Learning with group discussions and presentations using Unila's V Class	Post-test score

The stages of implementing learning with PBL implementation are carried out through the stages listed in figure 1. The stages of determining the project are given direction and group assignment mapping is guided by the lecturer following the learning outcomes of the subject with 5 working groups, namely pisces, reptiles, amphibians, aves, and mammals. V-Class Unila has been implemented starting from the project determination stage to the result presentation. The stages of project design and project implementation are carried out independently by students and their working groups. Lecturers provide time limits for project implementation and reporting. Lecturers monitor project implementation twice a week, every Monday and Friday. Monitoring activities for project implementation carried out by lecturers also serve as material for performance assessment during the project implementation process. Project results are presented to other groups for input, objections, and suggestions for improvement of the results. Project-based learning activities closed with a reflection on the results of project reporting from each group and project evaluation activities.

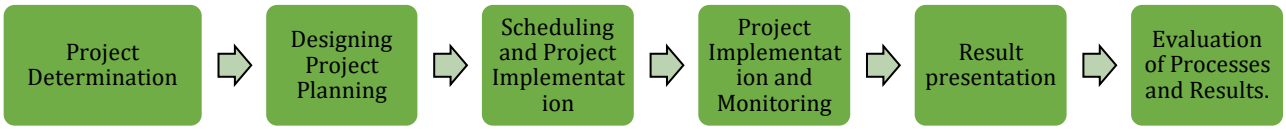

Figure 1. Stages of Implementation Project-Based Learning

Population and Samples

The population in this study were all students of biology education, Faculty of Teacher Training and Education, the University of Lampung totaling 371 people. The sample was obtained using a purposive sampling technique, totaling 124 students who had taken the Animal Structure course and carried out online lectures using V Class at the University of Lampung. Determination of the experimental group amounted to 62 people and the control group amounted to 62 people. The experimental group is biology education students who take the Animal Structure course for the 2021/2022 Academic Year. The control group is students who have taken the Animal Structure course for the 2020/2021 Academic Year.

Instrument

The instruments of this research include instruments related to the independent and dependent variables. The instruments on the independent variables consist of: (1) the implementation of lectures in the experimental class using PjBL learning observation sheets and student response questionnaires. (2) Student intrinsic factor instrument. Intrinsic factor indicators are interest, competence, effort, pressure, compulsion, usefulness, and relevance (Lin & Wang, 2021; Maulina et al., 2022; Reeve, 2012). The number of question items is 40 questions in the range of each statement item having a minimum score of 1 and a maximum score of 7 on the criteria from very incorrect to very true. Item statements about each indicator are given positive and negative statements.

The instrument on the dependent variable is a cognitive question given after treatment (posttest). Question items are arranged based on the competencies listed in the learning outcomes of the course, namely analyzing the structure of vertebrate organs (pisces, reptiles, amphibians, aves, and mammals) which include: (a) basic animal tissues (b) integumentary system, (c) skeletal system, (d) muscular system, (e) nervous system, (f) endocrine system, (g) circulatory system, (h) respiration, (i) digestive system, (j) urinary system, and (k) reproductive system. There are 55 questions that have been validated by experts and the results of instrument testing. The test is administered using a quizizz.

Table 2
Indicator of intrinsic factor

No	Indicator	Item qustion
1	Interest in problem	6
2	Competence	6
3	Learning tenacity	4
4	Stress in learning	4
5	compulsion in learning	6
6	Usefulness	6
7	Connection	8

Procedure

This research is an experimental studythatis implemented with the stage as shown in figure 2. The study was conducted based on the results study on the implementation of online learning for one semester. Observation and learning activities indicated the presence problem in learning exhaustiveness. This shows the lack of students' understanding of the subject matter so there is a need for a learning model to improve learning outcomes and student activity.

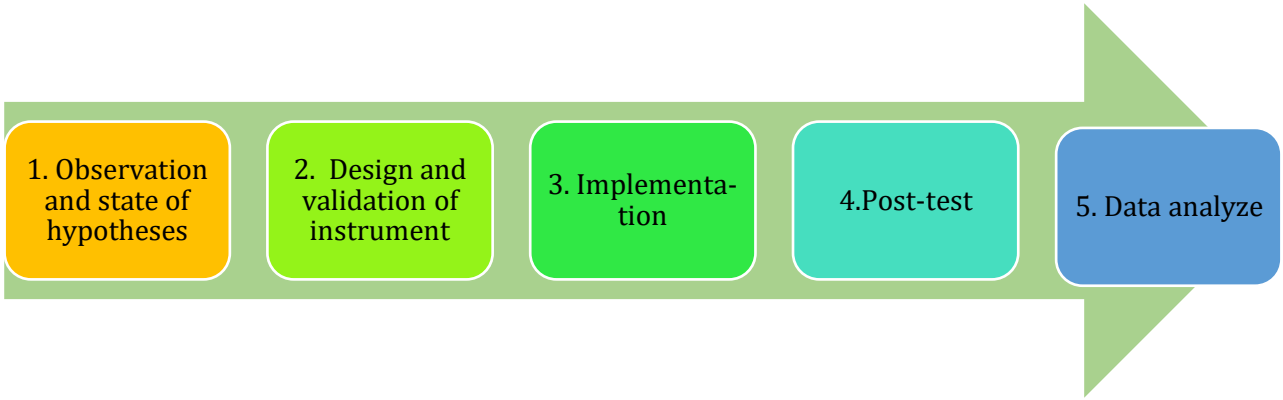

Figure 2. Research Procedure

Data Analysis Techniques

The collected data were analyzed using the Kolmogorov-Smirnov test for knowing the normality and the data homogeneity test used the Fisher test (F-test) at the significance level of 0.05. The hypothesis is tested using simple regression analysis at a significance level of 0.005 with the SPSS version 25.

RESULTS AND DISCUSSION

The product of PjBL of animal structure subject matters is presented in Table.3. Implementation of learning in the control and experimental classes is carried out by integrating technology in lectures using the Unila V-Class moodle. The experimental sample consisted of 62 students who were divided into 2 experimental classes with the same experimental treatment. The implementation of PjBL is carried out by giving projects to students in groups to build a comprehensive understanding. The form of the project is in the form of learning videos resulting from students conducting experimental activities on the implementation of veterinary surgery related to animal structure material as well as reviewing and analyzing based on the facts observed from the results of the surgery. Each class of vertebrates was observed, studied and compared its parts and functions starting from the integument, skeletal, muscular, nervous, endocrine, circulatory, respiratory, digestive, urinary and reproductive systems. The results of student studies and discussions are brought to a discussion forum and a questions session in the Unila V-class moodle, for further confirmation of conclusions based on observed facts and data with valid reference sources.

The results obtained showed that PjBL was able to improve student understanding compared to the control class ($p<0.05$) which was shown in the post-test results (Tabel 7). The group of students has a project on what to do. The steps are following what was conveyed by (Flemming, 2000) where the lecturer provides a focus for the project, identify essential knowledge and skill areas to be learned through project activities, introduce the project and involves students in shaping it, established project timelines and milestone, monitoring students progress, evaluate the project, reflect on gathered data and next steps At the final stage, the lecturer also provides an assessment and reinforcement of the product or project that has been produced by students. The steps are also in line with SEAQIL (Hamidah et al., 2020) which stated that the project-based learning method includes several activities; choosing a project topic, designing a project plan, creating a project timeline, finishing the project, assessing, and evaluating the project. From the lecturers' experience, students can quickly grasp their understanding of the project-based learning activities and adapt successfully yet progressively to such teaching methods (Hira & Anderson, 2021). At the end of the project, students presented the result to the lecturer and another group. The representative of the group delivered their final result and each group gives an overall assessment. As the final stage, reflection was done mainly related to the process of project-based learning to the group in general as well as the presenters.

The application of project-based learning can achieve deeper learning objectives, as seen from the learning outcomes. The results of the calculation of the average value of learning outcomes obtained in the experimental class are higher than the control class. This proves that the effectiveness of learning using PjBL in the experimental class is more effective than the control class. This is supported by the statement of (Domenici, 2022) the 'STEAM project-based learning' activities, revealed that most of the objectives were successfully reached, succeeded in increasing students' cognitive levels in literacy

(Sugianto, 2022), were practiced and effective to enhance student's productive competences (Jalinus et al., 2017).

Table 3
Experimental class project results

Classses of Animal Project	Class A Experimental Group Products	Class B Experimental Group Products
Pisces	https://bit.ly/piscesA	https://bit.ly/PiscesB
Reptil	https://youtu.be/pHUsKZ2X0ZE	https://drive.google.com/file/d/1FwVvXZ6RhEx8lquCzuT0EdZaydi9gIX_/view?usp=drivesdk
Amphibi	https://youtu.be/A9pi_tKEybo	https://youtu.be/8QIVKhBLq3I
Aves	https://youtu.be/1pPY0kSgf8c	https://youtu.be/L6ntdmA0pz8
Mamalia	https://youtu.be/Khhhf5Zd3wY	https://drive.google.com/file/d/1FwVvXZ6RhEx8lquCzuT0EdZaydi9gIX_/view?usp=drivesdk

Table 4
Learning Outcomes in Animal Structure Subject Matters

Data	Experimental Class	Control Class
Maximum score	90	76
Minimum Score	66	58
Average	72	65

Table 4 showed that the average learning outcome of the experimental class was higher than the control class. The prerequisite tests included normality test using Kolmogorov-Smirnov test and homogeneity test using F-test (α = 0.05). The tests used SPSS version 23. Data is normally distributed if the significance value is more than α. The normality test results can be seen in Table 5.

Tabel 5
Normality Test

Class	Test Result	Sig	α	Description
Experiment	Learning outcomes	.066	0.05	Normal
Control	Learning outcomes	.087	0.05	Normal

The statistical value Kolmogorov- Smirnov known result data learning outcomes in the experimental group and the control group is 0.66 and 0.087, when compared to the two data with a significance value of 0.05, the significance value of learning outcomes data experimental and control groups greater than the criterion of significance score 0.05 (Table 5.). Therefore, statistically the score data social studies learning outcomes of the experimental group as well as a distributed control group normal. Regarding the homogeneity test, data is homogeneous if the significance value is more than α. The homogeneity test results are presented in Table 6

Table 6.
Homogeneity Test

Class	Test Result	Sig	α	Description
Experiment	Learning outcomes	0.603	0.05	Homogeneous
Control	Learning outcomes	0.691	0.05	Homogeneous

Table 6, showed the calculation criteria, the H_0 was accepted at α = 0.05meaning that the data of the test score of the students' learning outcomes in both classes were homogeneous. The t-test used an independent t-test for post-test was utilized to identify the effect of the PjBL model and intrinsic motivation on the students learning outcomes. The hypothesis testing used the independent t-test to identify the effect of the Pjbl and intrinsic motivation on learning outcomes.

Table 7, indicates that the significance values of the independent t-test of learning outcomes were 0.000<0.05. The results of data tabulation to measure the seven indicators of intrinsic learning

motivation. Figure 3 has represented the percentage of achievement of student learning motivation indicators from cycle I. The highest aspect reached is usefulness and the lowest aspect reached is stress in learning. The regression testing was used to identify the relationship between intrinsic motivation on learning outcomes. The test results are indicated in Table 8.

Table 7.
Independent t-test of learning outcome experiment class

Class	N	Mean	SD	Sig.	α	Description
Experiment	51	71.92	4.303	0.000	0.05	Sig.<0.05

Table 9 represents that thestudents' intrinsic motivation ability is in the high category, but has no effect on student learning outcomes (p<0.05). All students have high motivation in carrying out learning. Students are interested and feel happy in carrying out online learning. Figure 3 shows the results of the data showing that the intrinsic motivation of students in carrying out and participating in animal structure learning activities is very good. Students were very enthusiastic about the problems presented (76.6%) and felt the benefits of studying material in animal structure lectures (76.2%). However, in the process of implementing PjBL learning using the V-Class (online) there are still many obstacles. Especially in the syntax of designing and planning projects at the beginning, students still experience obstacles in collaborating and formulating initial projects that are in line with the intrinsic motivation score in the stress in Learning section (Fishbach & Woolley, 2022) and (Pelikan et al., 2021). Students get pressure during learning. Another assumption that was found was that there were still several forms of learning cognitive assessments that were not in line with the PjBL series carried out by students (Bai et al., 2021). In addtion, causing high self-motivation in carrying out learning is not accompanied by high learning outcomes (Table 8 and Table 9).

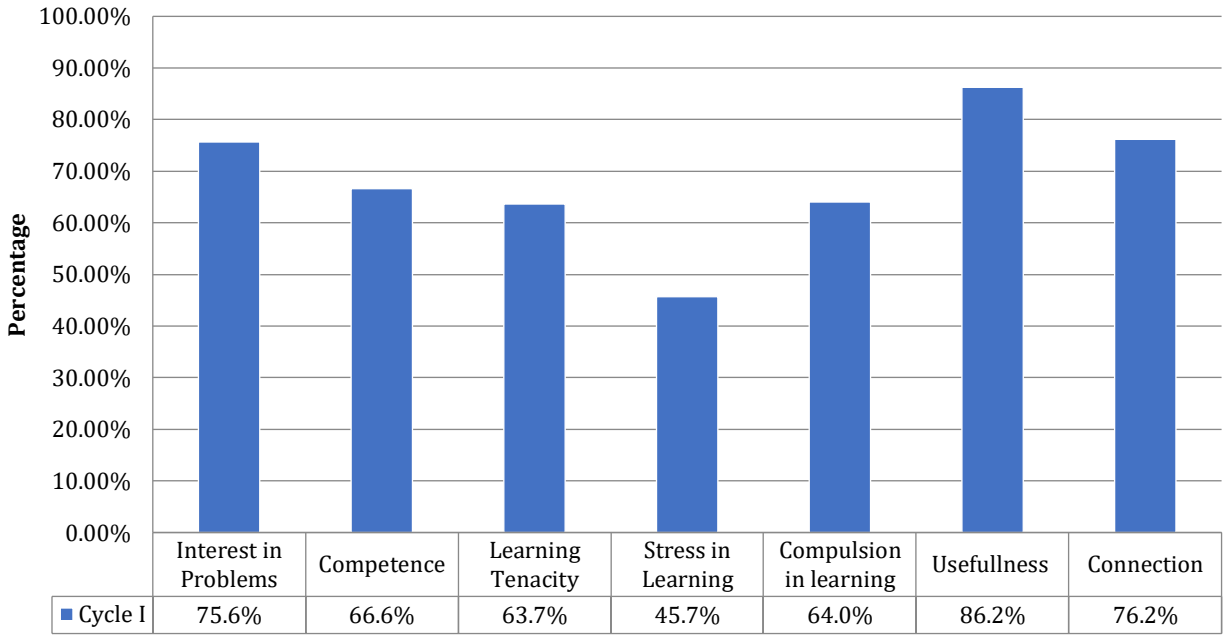

Figure 3. Percentage of Achievement of Student Learning Motivation Indicators

Table 8.
Regression test of learning outcome and intrinsic motivation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.810	1	.810	.043	.837[b]
Residual	924.877	49	18.875		
Total	925.686	50			

Intrinsic motivation simultaneously has no significant effect on learning outcomes (0.837>0.05). From table 9 it is known that t count 0.207 < t table 2.679 so that there is no influence of intrinsic

motivation on learning outcomes.

Table 9.
The independent variable regression coefficients model of learning outcomes

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	70.777	5.558		12.734	.000
Intrinsic motivation	.007	.036	.030	.207	.837

The regression model can be used to create a regression equation that describes the relationship of the intrinsic motivation to the learning outcome. Based on these data, the regression equation Y = 70.777 + 0.007 X can predict the dependent variable.

The linearity test is one of the classical assumption tests that is carried out to determine the linear nature of the distribution of data between X and Y variables. It is necessary to know whether the linear nature of the X and Y relationship affects the validity level of the resulting regression model. So, no matter how good the resulting regression model with a high R squared is, if the data does not have a linear nature, it is likely that an estimation error will occur. The linearity test is shown in figure 4. Based on the scatter plot above, the distribution of values in the plot forms a random pattern, so the assumption of linearity was fulfilled.

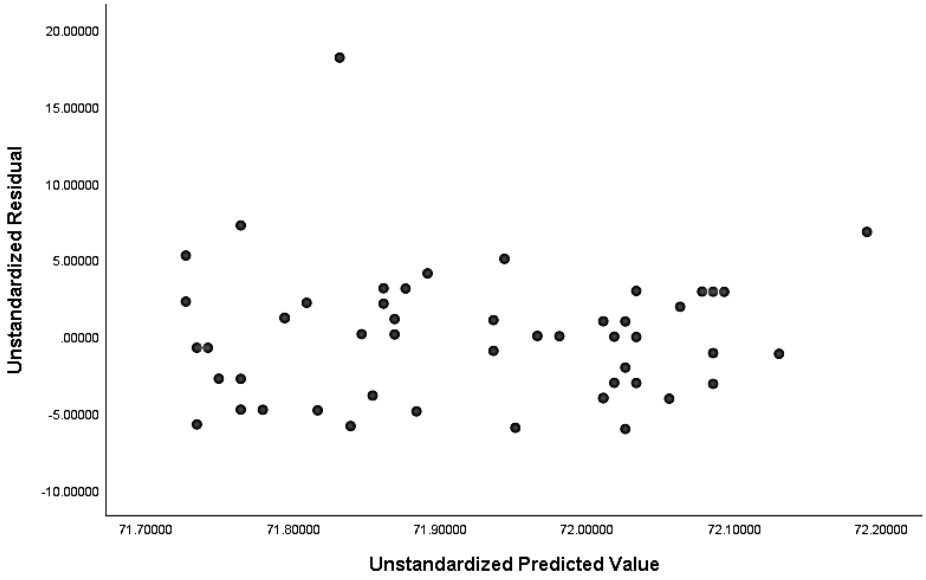

Figure 4. Linearity test

To evaluate the impact of the proposed project-based learning and intrinsic motivation was conducted a survey at the end of the learning process. The student's response was described in Figure 4. This survey consists of 7 indicators which are divided into 40 questions. Based on the survey results, it is known that all students have high intrinsic motivation (≥60) in all indicators except for the stress in learning indicator about 45.7%. The independent variable regression coefficients model of learning outcomes obtained a significance of 0.000 and an alpha of 0.05. Because sig < 0.05 (0.000 < 0.05) with a 95% confidence, then the hypothesis is accepted. If it can be concluded that intrinsic learning motivation has a positive influence on learning outcomes. It has happened because the syntax in this learning model contains various activities that encourage students to think and play an active role therefore the students could be understand better the material being discus. The correlation of project-based learning, intrinsic motivation, and learning outcomes reinforce the result of previous studies (Filippatou & Kaldi, 2010); (Hira & Anderson, 2021) and (Tanaka, 2022).

CONCLUSION

The Unila's Moodle V-Class has an impact on the high intrinsic factor of students to participate

in online learning. There was a significant difference in learning outcomes between the experimental class (using v-Class) compared to the control class. However, there was no relationship between student learning outcomes with high intrinsic factor.

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