

The Effect of Gender-Based Project Based Learning (PjBL) Ecomedia Pop Up Book Learning Model on Sociology Subject Learning Outcomes

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A B S T R A C T

This study focuses on efforts to improve student learning outcomes in the subject of Sociology at SMA Negeri 1 Slawi. It was found that student learning outcomes were still suboptimal, attributed to a lack of variation in teaching methods, minimal active student engagement, and limited learning media. To address these issues, the study implemented a Project Based Learning (PjBL) model based on ecomedia. Using a quantitative method and factorial design, the research involved 72 tenth-grade students, with class X.9 serving as the experimental group and class X.8 as the control group. Through the analysis of pre-test and post-test scores, the study evaluated the differences in learning outcomes before and after the implementation of the PjBL model. The results indicated that the ecomedia-based PjBL model had a significant positive impact on student learning outcomes for both male and female students, with no notable differences between the two. These findings highlight the importance of developing teaching methods that combine conventional elements with PjBL, as well as encouraging teachers to be more creative in utilizing learning media to make the teaching and learning process more engaging and effective for students.

Keywords: *PjBL, Gender, Learning Outcomes*

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INTRODUCTION

Learning is a process of interaction between students and teachers and learning resources at school. The learning process can be in the form of assistance provided by the teacher so that students gain knowledge, knowledge, mastery of skills and habits, as well as the formation of attitudes and beliefs in students. In other words, learning is a process to help students learn well. Winarti (2019) argues that the learning process in schools is an integrated educational process, and is systematically coordinated with clear evaluations and measures. One of the important components in education is the learning process that cannot be separated from the teacher. Teachers have an important role in creating active and effective learning. Therefore, a teacher must choose media and learning models that improve and can involve students to play an active role in learning activities, but until now teachers still use conventional learning models in learning.

The birth of the independent learning curriculum is a form of renewal and improvement of the 2013 curriculum or what is commonly known as the concept of independent learning which has the main essence of changing the learning pattern from teacher centered to student centered and focusing on the freedom to learn independently and creatively. In independent learning, the role of the teacher becomes increasingly

The Effect of Gender-Based Project Based Learning (PjBL) Ecomedia Pop Up Book Learning Model on Sociology Subject Learning Outcomes important because in addition to being a facilitator, the teacher is also required to be a motivator, prioritize students above their career interests and become a driving force to take actions aimed at providing the best for students.

According to Panginan (2022) the independent learning curriculum not only gives freedom to students in developing their potential, but gives freedom to education units to manage a curriculum based on regional autonomy and provides freedom for teachers to design learning, lesson plans that have been complained about because of the detailed and rigid structure and requires teachers to follow the learning stages that have been made resulting in teachers spending more time on administrative matters, with the implementation of an independent learning curriculum all designs and lesson plans are made more concise by containing important components so that teachers have plenty of time to evaluate learning.

Sociology subject is class X in the independent curriculum contained in social studies subject matter which is a merger and fusion of disciplines, namely history, sociology, economics, and geography. In the Merdeka Curriculum, the intracurricular learning process is diverse where the content will be optimized so that students have enough time to explore concepts and strengthen competencies. Teachers have the flexibility to choose various teaching tools so that learning can be tailored to the learning needs and interests of students. Sociology class X subject matter has a focus on individual and community studies.

According to Dewi (2019) in learning sociology, students are expected to be able to understand the existence of society and be able to interact directly in society by showing tolerance for differences that exist in society. Indicators of student learning success in sociology lessons are how students' understanding of various social symptoms in society and what problems may arise in society by looking at students' learning achievements in the learning process. In the study of individuals and society, there is material about the variety of social symptoms that exist in a multicultural society through the basic concepts of sociology. Variety of social symptoms is a phenomenon that affects or is affected by the behavior of creatures around society. The way we do the things we do is influenced by the phenomena we face at any given time. There are several changes and even conflicts in the unification of social dimensions that exist in humans to interact with each other as social beings.

The symptoms that exist in this social life occur spontaneously and generally cause changes, both changes that lead to something positive or negative. Therefore, this material is very important to be understood by the younger generation now as a provision for students to live in society and students are able to find various kinds of efforts to solve social problems that occur in society as a step to overcome negative social symptoms. The role of the younger generation, as agents of change, is highly coveted as part of problem solving or social problem solvers in society.

According to Saido in Agustin and Yoga (2022: 4) teachers tend to teach students to memorize concepts, while problem-based, collaborative and investigative learning is still not implemented by teachers. Meanwhile, the results of Sopandi's 2019 research in Agustin and Yoga (2022: 4) state that teachers tend not to understand the syntax of innovative learning models that have been used so far so that the use of conventional models remains a mainstay in teaching. In learning at school teachers should choose and use models, strategies, methods, approaches, techniques and media that involve students actively in learning. To increase the involvement of students in Sociology subjects, it is necessary to use a Sociology learning model with a scientific approach, one of which is the Project Based Learning model.

According to Halimah and Marwati (2022: 39) Project Based Learning is interpreted as a learning approach that prioritizes the involvement of students or what is known as a student centered learning approach. Through PjBL, learners are involved in exploring important and meaningful questions through the process of investigation and collaboration. According to Kovalyova et al in Halimah and Iis (2022: 116) PjBL is a dynamic learning approach because it teaches learners to explore real-world problems and challenges while

The Effect of Gender-Based Project Based Learning (PjBL) Ecomedia Pop Up Book Learning Model on Sociology Subject Learning Outcomes developing cross-curriculum skills while working in groups collaboratively. In a project-based learning environment, collaboration occurs between all members, both learners and teachers, and to support learners' creativity through PjBL. According to Sani in Dewi (2019) Project-Based Learning (PBL) is a teaching and learning strategy that involves students to work on a project that is useful for solving problems in society or the environment. The problem studied is a complex problem and requires mastery of the subject matter in an effort to solve it. This learning allows learners to develop their creativity in designing and creating projects that can be utilized to solve problems. In project-based learning, learners are given the task of developing themes or topics in learning by conducting realistic project activities. In addition, the application of project-based learning encourages the growth of creativity, independence, responsibility, confidence and critical and analytical thinking in students. (Sulaeman, 2020: 5).

In this study, researchers will apply a project-based learning model, with the hope of improving student learning outcomes and developing all their potential by creating a project in the form of ecomedia as a Sociology learning media. The making of this ecomedia is expected to foster mastery of soft skills that are very important for the life of each individual to be able to compete in the 21st century. Ecomedia learning is an effort, a way to maximize the function and usefulness of an item (especially items that are considered not used) to be used as basic material in making learning media. Ecomedia learning is one form of simple learning media that can be developed in the learning process (Hendrasmoto and Nur, 2018: 63).

The use of this sociology Ecomedia can function as a learning medium and learning strategy. The characteristics of Sociology subjects that teach abstract concepts and knowledge require media that can be easily used in various activities or learning processes including to stimulate the learning process, deliver learning materials and evaluate learning. While as a learning strategy, Ecomedia emphasizes the principle of learning objectives to be achieved and this is based on the principle of media development that learning media can be created by teachers and students (Hendrasmoto and Nur, 2020: 84-86).

The learning process is basically a process of teacher interaction with students, either directly or indirectly. In an interaction, the teacher should have an idea or an idea to meet the needs of students in the learning process, namely with learning models. Models in learning are very important, because they can support the achievement of a goal in learning.

One of the learning models that can be developed and adopted to place students at the center and improve learning outcomes is the application of the Project Based Learning (PBL) model. According to Halimah (2022: 39) PjBL is a learning approach that prioritizes learner involvement or is student centered. Through PjBL, learners are involved in exploring important and meaningful questions through a process of investigation and collaboration. This opinion can be interpreted that with the PjBL model, students can be directly involved in the learning process carried out by the teacher so that through this learning it is hoped that teachers and students can explore the abilities of students to the fullest.

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state (Rita, 2020). In the learning process, it cannot be denied that it involves two learning objects, namely male and female students. When the learning process takes place, both male and female students will compete with each other in achieving the goals they have, especially with regard to learning outcomes.

According to Niederle & Vesterlund in Avila (2021), students' learning outcomes, apart from being influenced by the learning model, are also influenced by gender or sex. Gender is a difference that is quite visible in public schools, but rarely or even not observed in the world of education. Ideally, male and female students have equal learning outcomes, but it turns out that there are many studies that reveal gender differences in learning outcomes.

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The difference in learning outcomes between male and female students is called the gender gap concept.

Learning outcomes are related to cognitive learning outcomes which are concerned with intellectual learning outcomes consisting of six aspects, namely knowledge or memory, understanding, application, analysis, synthesis, and evaluation. The first two aspects are called low-level cognitive aspects and the next four aspects include higher-level cognitive. (Sudjana, 2014). Cognitive learning outcomes that are less than optimal at school are deemed necessary to improve the quality of cognitive learning outcomes, related to the ability of students to master the content of learning that must be better.

Learning media needs to be created and used to help students understand the teaching material. Although the development of science and technology is increasingly advanced, and encourages optimal utilization of technological results in learning. Teacher innovation and creativity in facilitating students in creating and developing learning media to assist the learning process cannot be separated from school support in the form of facilities and infrastructure, policies and school systems. School limitations in supporting teacher innovation and creativity will have little effect on the learning process. So it is a challenge for teachers to be more creative in utilizing and using tools/media that are cheap and efficient even though they are simple.

One of the learning media innovations is the use of Pop Up Book. Wati in Winarti (2019) states that Pop Up Book is a 3-dimensional book that can move by opening and closing and its visualization is interesting by using paper as a material for folds, rolls, shapes, wheels or loops. Pop Up Book media can give its own impression to students in order to attract attention and can increase the enthusiasm for learning of students. According to Arum in Winda (2022) this Pop-Up Book learning media stimulates students' thoughts, feelings, attention, interests and learning outcomes so that the teaching and learning process can run smoothly and students are not bored or bored with this learning because it is not focused on teachers who always lecture.

Wulandari (2019) states that Pop Up Book media can attract students' interest in learning because it is made with elements of motion and 3-dimensional elements when the book is opened. Pop Up Book media can make it easier for students to understand the material presented by the teacher and can capture what is explained by the teacher, students can also be active and enthusiastic about making creations. With an innovative and creative learning model, it is hoped that students will be active, creative, and happy with learning so that learning objectives can be carried out properly. According to Hendrastomo and Januarti (2018: 64-65) making learning ecomedia means also teaching students good environmental habits by reusing and recycling used items at school. From this side, learners are not only invited and heard but learners will demonstrate how to live an environmentally friendly life. This is an appropriate and effective way to teach ecoliving awareness, implementation in an adiwiyata school, teach creativity and save a lot of money on learning activities.

The environment around us can be used as a learning resource. The environment includes, the community around the school, the physical environment around the school, materials that are left over or not used, used materials and when processed can be used as a source or tool in learning, as well as natural events and events that occur in society. So, environmental learning is an understanding of certain symptoms or behavior of objects or scientific observations of something around as teaching material for students before and after receiving material from schools by bringing experiences and discoveries with what they encounter in their environment (Akhirudin, 2017: 80).

So far, students have been learning in the classroom, in the coming years students can learn outside the classroom or outing class so that they can discuss with the teacher not only listening to lectures from the teacher, but encouraging students to be more courageous to appear in public, clever in socializing, creative, and innovative. This is also in line with the concept of independent learning where the new curriculum focuses on the freedom to learn independently and creatively.

Aini in Dawson (2016) states that independent learning is an idea that frees teachers and students in determining the learning system. The purpose of independent learning is to create an enjoyable education for students and teachers because so far education in Indonesia has emphasized the knowledge aspect rather than the skills aspect. Independent learning also emphasizes aspects of character development in accordance with the values of the Indonesian nation.

SMA N 1 Slawi is a school that implements the independent curriculum and will go towards an independent adiwiyata school, so the making of ecomedia in Sociology learning supports the program. Students will learn to understand Sociology material which has a special character where the material taught tends to be abstract and difficult to understand. This ecomedia can be a special strategy as a medium that can bridge students learning abstract material into reality, because basically Sociology materials exist and are real in society. Therefore, in the process of teaching and learning activities teachers and students must be able to work together to build a learning atmosphere that is fun, encouraging and certainly not boring because in essence learning is an interaction between students and the environment.

The objectives of this study are to examine the impact of the Project Based Learning (PjBL) Eco media Pop Up Book learning model on the sociology learning outcomes of male and female students in class X at SMA N 1 Slawi during the 2023/2024 academic year. Specifically, the study aims to determine whether the PjBL Eco media Pop Up Book model significantly influences the learning outcomes of male students, as well as female students, in sociology subjects. Additionally, the study seeks to explore whether there are significant differences in the learning outcomes between male and female students who use the PjBL model compared to those who use conventional learning models in the same class.

METHOD

This research is quantitative research that uses numbers and statistical analysis, based on the philosophy of positivism to examine certain populations or samples. According to Sugiyono (2022: 23), this research collects data with research instruments and analyses it quantitatively to describe and test hypotheses. The design used is a factorial design, which considers moderator variables that affect the relationship between the independent variable, namely the Project Based Learning (PjBL) learning model, and the dependent variable, namely learning outcomes moderated by gender (Sugiyono, 2020: 119). The study population consisted of 106 grade X students taken from 3 classes taught by researchers.

In analysing the data, researchers used the classical assumption test, which included normality test and homogeneity test. In addition, researchers also apply quantitative analysis which includes Paired Sample T-Test and Two Way Anova test. Then, hypothesis testing was also carried out after the normality test which stated that the data were normally distributed and the homogeneity test which stated that the data of both classes had homogeneous variances.

FINDINGS AND DISCUSSION

Pre-Test and Post-Test Learning Outcomes of Class X.9

Table 1. Pre-Test and Post-Test Results of Class X.9

	N	Minimum	Maximum	Average	Deviasi
Pretest	36	57	90	74,06	9,252
Post test	36	77	97	89,31	3,897

Based on table 1 which contains the results of the pretest and posttest, it can be seen that the pretest to posttest scores have increased well. The average pretest score was 74.06

The Effect of Gender-Based Project Based Learning (PjBL) Ecomedia Pop Up Book Learning Model on Sociology Subject Learning Outcomes with the lowest score of 57 and the highest score of 90. While the posttest score experienced a good change, this was evidenced by the average score obtained of 89.31 with the lowest score of 77 and the highest score of 97.

Description of Pre-Test Data Class X.9

Class X.9 is the experimental class used for research with the Project Based Learning (PjBL) learning model using Ecomedia Pop Up Book. Before being given treatment in the form of a Project Based Learning (PjBL) learning model using Ecomedia Pop Up Book, pretest questions are given to students first to measure initial abilities. Data on the initial learning outcomes (pretest) of students on cognitive aspects have been calculated with SPSS assisted statistical calculations as follows:

Table 2. Analysis of Pre-Test Score Description of Class X.8 and X.9

	N	Minimum	Maximum	Average	Deviasi
Control Pretest	36	50	93	73,14	12,345
Experiment Pretest	36	57	90	74,06	9,252

Table 2 presents the descriptive analysis of pretest scores for two groups of Grade X learners, namely the control (X.8) and experimental (X.9) groups with 36 learners each. The minimum score for the control group was 50, while that for the experimental group was 57, with the maximum score of the control group being 93 and that of the experimental group being 90. The mean pretest score showed that the experimental group obtained 74.06 which was higher than that of the control group which reached 73.14 indicating better academic performance in the experimental group although the standard deviation of the control group was higher (12.345) than that of the experimental group (9.252). Overall, this table shows that the experimental group only had a higher mean score, but the learners' academic performance was lower compared to the control group.

Description of Post-Test Data of Class X.8 and X.9

Data on students' post-test results were obtained after students received treatment during learning in the form of a Project Based Learning (PjBL) learning model using Ecomedia Pop Up Book. Data collection was carried out in classes X.8 and X.9, each class totaling 36 students. The average final learning outcomes (posttest) of the material Variety of Social symptoms based on SPSS calculations are as follows in table 3.

Table 3. Analysis of Post-Test Score Description of Class X.8 and X.9

	N	Minimum	Maximum	Average	Deviasi
Control Pretest	36	81	97	88,67	4,243
Experiment Pretest	36	77	97	89,31	3,897

Table 3 presents a descriptive analysis of posttest scores for two groups of grade X learners, namely the control and experimental groups, each consisting of 36 learners. The minimum score for the control group was 77, while that for the experimental group was 81, while the maximum score for both the control and experimental groups was 97. The mean of the posttest scores shows that the experimental group scored a mean of 89.31, higher than the control group whose mean was 88.67, indicating better academic performance in the experimental group, although the standard deviation of the control group was greater at 4.243 compared to the experimental group which had a standard deviation of 3.897, indicating no greater variation in learner performance in the experimental group. Overall, this table shows that after the learning intervention, the experimental group performed better in the posttest than the control group.

Table 4. Paired Sample T-Test results of male gender class X.9

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	74,50	12	8,006	2,311
	Post_Test	89,42	12	2,712	,783

Referring to the results of the Paired sample T test displayed in table Y, it can be seen that the average learning outcomes of male students in class X.9 are Pre test is known to be 74.50 and post test is 89.42. These results show that there is a difference in the average learning outcomes before and after the application of the PjBL ecomedia Pop Up Book learning model.

Table 5. Significance Results of Paired Sample T-Test (T-test) of male gender class X.9

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	Pretest - Post_Test	-14,917	7,982	2,304	-19,988	-9,845	-6,473	11	,000

In table 5. it is known that the significance value is 0.000 or <0.05 , so it can be concluded that there is a significant difference. In other words, the Project Based Learning (PjBL) ecomedia Pop Up Book learning model has a significant effect on the learning outcomes of sociology subjects in male students of class X SMA N 1 Slawi Semester 2 of the 2023/2024 academic year.

Table 6. Paired Sample T-Test Results of female gender class X.9

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	73,83	24	9,972	2,036
	Post_Test	89,25	24	4,426	,903

Referring to the results of the Paired sample T test displayed in table Y, it can be seen that the average learning outcomes of female students in class X.9 are Pre test is known to be 73.83 and post test is 89.25. These results indicate that there is a difference in the average learning outcomes before and after the application of the PjBL ecomedia Pop Up Book learning model.

Table 7. Significance Results of Paired Sample T-Test (T-test) of female gender class X.9

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	Pretest - Post_Test	-15,417	11,201	2,286	-20,147	-10,687	-6,743	23	,000

In table 7. it is known that the significance value is 0.000 or <0.05 , so it can be concluded that there is a significant difference. In other words, the Project Based Learning (PjBL) ecomedia Pop Up Book learning model has a significant effect on the learning outcomes of sociology subjects in female students in class X SMA N 1 Slawi Semester 2 of the 2023/2024 academic year.

Table 8. Two Way ANOVA Normality Test

Description	Statistics	df	Significance
Standardized Residual for Learning Outcomes	0,967	72	0,057

Table 8 shows the results of the residual normality test for the learning outcomes variable in the Two Way ANOVA analysis. The test results obtained a statistical value of 0.967 and a degree of freedom (df) of 72, obtained a significance (p-value) of 0.057. Because the significance value is greater than 0.05, it can be concluded that the residual data is normally distributed. This shows that the normality assumption, which is one of the important requirements for the validity of the Two Way ANOVA analysis, has been met. Furthermore, the Two Way ANOVA test was conducted to determine the effect of independent variables on the dependent variable and the effect of the interaction of independent variables on the dependent variable in table 9 below.

Table 9. Two Way ANOVA Test Results

Description	F	Sig.
Gender	1,053	0,308
Learning Model	1,053	0,308
Gender*Learning Model	1,417	0,238

Table 9 presents the results of the two-way analysis of variance (Two Way ANOVA) that evaluates the effect of learning outcomes and learning models on the observed variables. The results show that gender has an F value of 1.053 with a significance (Sig.) of 0.308, indicating no significant difference.

The learning model also had a significant effect with an F value of 1.053 and Sig. 0,308. In addition, the interaction between gender and learning model showed an F value of 1.417 with Sig. 0.238, indicating that the combination of these two variables does not significantly affect learning outcomes. Overall, both gender and learning model, either individually or in interaction, have an insignificant impact on students' learning outcomes.

Table 10. Differences in learning outcomes between male and female genders using PjBL and conventional learning models.

Descriptive Statistics

Dependent Variable:

Gender		Mean	Std. Deviation	N
Female	PjBL	89,42	4,432	24
	Conventional	89,25	4,426	24
	Total	89,33	4,382	48
Male	PjBL	87,17	3,538	12
	Conventional	89,42	2,712	12
	Total	88,29	3,290	24
Total	PjBL	88,67	4,243	36
	Conventional	89,31	3,897	36
	Total	88,99	4,058	72

Referring to the results of table 10, it can be seen that the average learning outcomes of male students in class X.9 with PjBL is known to be 87.17 while for class X.8 with the Conventional model is known to be 89.42. These results show that there is a difference in the average learning outcomes of male students between the experimental class and the control class. For female students in class x.9 with PjBL, the average learning outcome is known to be 89.42 while class X.8 with the conventional model is known to be 89.25. From these results it can be concluded that the average learning outcomes of the female gender are better than the male gender in the experimental class.

As for the results of the gender interaction test and the PjBL learning model on learning outcomes can be seen in the following table:

Table 11. Significance test of differences in learning outcomes between male and female genders using PjBL and conventional learning models.

Tests of Between-Subjects Effects

Dependent Variable:

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	48,069 ^a	3	16,023	,972	,411
Intercept	504810,250	1	504810,250	30624,129	,000
Gender	17,361	1	17,361	1,053	,308
Model_Learning	17,361	1	17,361	1,053	,308
Model_Learning	23,361	1	23,361	1,417	,238
Error	1120,917	68	16,484		
Total	571303,000	72			
Corrected Total	1168,986	71			

a. R Squared = .041 (Adjusted R Squared = -.001)

Referring to table 11, it can be seen that the significance value of the PjBL learning model is $0.308 > 0.05$. This shows that statistically there is no significant difference in learning outcomes between PjBL and conventional learning models. As for the relationship between gender and learning models, it is known that the significance value is $0.238 > 0.05$, which means that gender factors with PjBL and conventional learning models have no statistically significant effect on learning outcomes.

Referring to the research results previously described, it can be concluded that there are no significant differences in learning outcomes in sociology subjects between male students and female students who use the Project Based Learning (PjBL) learning model with those who use the conventional model in class X Semester 2 SMA N 1 Slawi 2023/2024 Study Year.

CONCLUSIONS

The study finds a significant influence of the ecomedia-based Project Based Learning (PjBL) learning model on the sociology learning outcomes of both male and female students in class X at SMA N 1 Slawi during the 2023/2024 academic year. The model positively impacts the learning outcomes of sociology for both male and female students. However, the study also reveals that there is no significant difference in learning outcomes between male and female students who use the PjBL model compared to those who follow the conventional learning model in the same class during the second semester of the academic year 2023/2024.

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