CHAPTER III
METHODOLOGY

3.1 Research Method

The method used in this research is pre-experimental research. The quantitative research method used is experimental research design. Borg & Gall (1993) cited by (Okpatrioka, 2023) stated that experimental research is the most reliable scientific research (most valid) because it is conducted with strict control of confounding variables outside the experiment. The experimental research design is divided into three parts: pre-experimental research, precise experimental research, and quasi-experimental research. The experimental research used in this research is the pre-experimental design. It is called a pre-experimental design because this design is not yet a natural experiment. Because there are still external variables that affect the dependent variables. So, the experimental results, which are the dependent variable, are not just the result of the experiment. This can happen because there are no control variables, and the sample is not randomly selected (Creswell & Creswell, 2018). To the research, this method was used to analyze the data by describing or presenting the collected data as it is.

3.2 Research design

This study followed a one-group pretest and posttest design. In this design, there is no control group to compare with the experimental group (Creswell & Creswell, 2018). The pretest was used to measure the initial understanding of the students. After the treatment, a posttest will be given during the final activity to measure any changes in their knowledge. In this way, the results of the treatment can be more accurately known because they can be compared to the state before the treatment. The design of this research can be shown in Table 3.1.

Table 3.1 Research design

Pretest	Treatment	Post-test
O_1	X	O_2

(Creswell & Creswell, 2018)

Description:

O_1 = Pretest score before treatment.

O_2 = Post-test score after treatment given.

X = Treatment is done by implementing an electrical circuit project into learning activities.

Based on Table 3.1, it is explained that the pretest-posttest is used without control variables. According to Creswell and Creswell (2018) this design includes a pretest measure followed by a treatment and a posttest for a single group. (O_1), implementation of electrical circuit projects as treatment (X), and the final post-test (O_2) to determine the results after implementation. Treatment. The research design was taken at the time of the process and the results of student products creative thinking in modeling electrical circuits into human blood circulation.

3.3 Population and Sample

This research was conducted in a Boarding School in Bandung Barat that used the national curriculum of 2013. A population is a set of units that possess variable characteristics under observation and for which studies' findings may be generalized(Shukla, 2020). The population of this research there are 68 students of 8th-grade junior high school students which determine by random sampling technique to get the participants for completing this research. The characteristics of participants in this research can be described in Table 3.2.

Table 3.2 Characteristics of participants

Participants	Age			Total	Frequency
	12 years	13 years	14 years		
Male	4	6	2	12	35%
Female	5	10	7	22	65%
Total	**9**	**16**	**9**	**34**	**100%**

Sampling is choosing a statistically representative sample of individuals from the population of interest(Majid, 2018). The sampling technique used a simple random sampling technique; this was done with the consideration that the position of students in the class is applied randomly without looking at the ranking of grades, gender, students, and student groups so that students have been randomly distributed in the specified class. In addition, the number of students in the class is the same; students receive material based on the same curriculum and have the same instructional time. The researcher selects the participants who can, willing, and

available to be studied (Creswell & Creswell, 2018). Based on Table 3.2 there are 34 students from VII-B will be participated on this research consists of 12 male students and 22 female students.

3.4 Assumption

According to the literature review, it could be assumed that:

a. Students have mastered the blood circulation material so that it is easy to do the objective test.
b. Students are experienced in making electrical circuits so that it makes it easier for students to assemble and develop their creativity.

3.5 Hypothesis

To analyze the hypothesis more significantly by using the pretest and posttest, the hypothesis is as:

H_0: There is no difference in students' concept mastery and students' creativity of learning the human circulatory system by using electrical circuit model and not using it.

H_1: There is a difference in students' concept mastery and creativity when learning the human circulatory system using an electrical circuit model compared to not using it.

Hypothesis will be measured with *Multivariate analysis of variance* which described as follow:

1. If the significance value is <0.05 the data is significant difference in students' concept mastery and students' creativity of learning the human circulatory system by using electrical circuit model
2. If the significance value is >0.05 the data is not significant difference in students' concept mastery and students' creativity of learning the human circulatory system by using electrical circuit model

3.6 Research Instrument

In this research, instruments are essential to use to obtain data. There are three kinds of instruments used in this study which can be described as:

3.6.1 Students' concept mastery

Objective tests related to students' concept mastery in multiple-choice based on cognitive level dimension Bloom's Taxonomy Revised. The subtopic used in the objective tests can be seen in Table 3.3.

Table 3.3 Subtopic of Cognitive Test item

Topic	Subtopic	Cognitive Process Dimension						Total
		C1	C2	C3	C4	C5	C6	
Structure and Function of Human Circulatory System	Blood	7	11		25	32, 33	36,37, 38,40	9
	Heart	1,3	14	15,16, 17	24		39,	8
	Blood Vessels	2,4,5			23, 26, 28			6
	Circulatory System on Human Body		8,10		22			3
Disorders or Abnormalities in the Circulatory System and Efforts to Prevent and Overcoming it	Coronary heart		13					1
	Stroke	6	9					2
	Anaemia		12					1
	Hyperthermia and Hypotension				27	34,		2
	Prevention of human circulatory system disorders			18,19, 20,21		29, 30, 31, 35	41,42	10
Total		7	7	7	7	7	7	42

Based on Bloom Taxonomy Revised, the cognitive level measured is C1 to C6. The instrument will be consulted and judged by some lecturers and experts in related fields to modify or revise the inappropriate test item with the content, distractor, or question statement.

The instruments were given in the pre-test that was conducted before the treatment to measure the students' initial understanding of the human circulatory system topic and at the end of learning as the post-test that will be analyzed with the pre-test score to see the difference of the students' knowledge in their understanding of the topic. The objective test will be analyzed using instrument development analysis before students are given the test.

a. Instrument Development Analysis

1) Validity test

The validity test is the most essential characteristic of any test. (Oluwatayo, 2012)describes validity as the conformity between a test score and the quality to be measured. This research uses validity to check whether the instrument can be measured for students' concept mastery of the science topic. The formula used:

The instrument's validity was checked using Pearson Product Moment Correlations through SPSS software. The essential decisions on validity tests are:

- If the value of Sig. > 0.05 product moment of the test declares as valid
- If the value of Sig. < 0.05product moment of the test declares as not valid

The test item's significant correlation with the total score suggests their validity.

2) Reliability test

A reliability test means the extent to which the results of a measurement can be trusted. A measurement result can be trusted if the measurement is carried out several times on the same group of subjects; relatively the same measurement results are obtained if the aspects measured in the subject have stayed the same (Matondang, 2014). So, a measuring instrument is reliable if the results are carried out in the same case, even though they are measured at different times. The formula used for assessing the reliability of test items is:

The instrument's reliability was checked using Pearson Product Moment Correlations through SPSS software. The essential decision on measuring the test for reliability test is described by comparing the r_{xy} value with the r table product moment:

- If the value of r_{xy} > r table product moment of the test declares as trusted
- If the value of r_{xy} < r table product moment of the test declares as not trusted

The instrument's reliability will be calculated to get Cronbach's Alpha. The reliability interpretation is represented in Table 3.4.

Table 3.4 Reliability interpretation

Correlation coefficient	Reliability criteria
0.80 – 1.00	Very High
0.60 – 0.79	High
0.40 – 0.50	Enough
0.20 – 0.39	Low
0.00 – 0.19	Very Low

(Damayanti et al., 2021)

3) Difficulty test

The difficulty level is defined as the percentage of items that are marked by the examiner. The difficulty level of an item is the correct answer value of the student, also known as the p-value (Boopathiraj and Chellamani, 2013). The difficulty level varies between 0.00 and 1.00, i.e. the closer the score is to 1.00, the better the difficulty level. Therefore, the following formula is used to determine the difficulty level of each section of the test:

$$\mu p = \frac{(\mu x)}{k}$$

Description:

μ_p = Difficulty index

μ_x = The amount of correct answer

k = Number of test items

The interpretation of difficulty level is classified as Table 3.5.

Table 3.5 Difficulty Index Interpretation

Value of Difficulty Index	Interpretation
0.00 – 0.20	Difficult
0.21 – 0.70	Medium
0.71 – 1.00	Easy

(Yockey, 2016)

b. Instrument Development Validity Result

The instrument to be used must be validated first. To test student understanding, the instrument used is multiple-choice questions as an objective test. The objective test will be verified for validity, reliability, and difficulty. It consists of 42 questions that experts have judged. Then, the questions were tested on grade 9 students who had studied the topic of the circulatory system, totaling 92 people. According to the analysis, results showed 0.666 for reliability, which is in the high category, and there were 28 valid questions to be used in this study. The number of test items that are accepted as the research instrument to measure students' concept mastery can be seen in Table 3.6.

Table 3.6 Recapitulation analysis objective test

Cognitive Level	Number test	difficulty	category	Validity Sig. (2-tailed)	Status	Revised number
C1	1	0.58	Medium	0.119	Valid	1
	2	0.61	Medium	0.300	Not Valid	
	3	0.66	Medium	0.035	Valid	2
	4	0.62	Medium	0.110	Not Valid	
	5	0.67	Medium	0.010	Valid	3
	6	0.70	Medium	0.006	Valid	4
	7	0.65	Medium	0.005	Valid	5
C2	8	0.70	Medium	0.011	Valid	6
	9	0.78	Easy	0.010	Valid	7
	10	0.73	Easy	0.019	Valid	8
	11	0.73	Easy	0.000	Valid	9
	12	0.78	Easy	0.000	Valid	10
	13	0.75	Easy	0.136	Not Valid	
	14	0.84	Easy	0.066	Not Valid	
C3	15	0.77	Easy	0.017	Valid	11
	16	0.62	Medium	0.363	Not Valid	
	17	0.83	Easy	0.019	Valid	12
	18	0.95	Easy	0.031	Valid	13
	19	0.84	Easy	0.115	Not Valid	
	20	0.75	Easy	0.001	Valid	14
	21	0.75	Easy	0.060	Not Valid	
C4	22	0.84	Easy	0.030	Valid	15
	23	0.71	Easy	0.000	Valid	16
	24	0.79	Easy	0.881	Not Valid	
	25	0.58	Medium	0.022	Valid	17
	26	0.77	Easy	0.000	Valid	18
	27	0.85	Easy	0.015	Valid	19

Cognitive Level	Number test	difficulty	category	Validity Sig. (2-tailed)	Status	Revised number
	28	0.02	Difficult	0.004	Valid	20
C5	29	0.71	Easy	0.000	Valid	21
	30	0.74	Easy	0.066	Not Valid	
	31	0.76	Easy	0.017	Valid	22
	32	0.74	Easy	0.045	Not Valid	
	33	0.74	Easy	0.000	Valid	23
	34	0.86	Easy	0.000	Valid	24
	35	0.70	Easy	0.023	Valid	25
C6	36	0.79	Easy	0.065	Not Valid	
	37	0.77	Easy	0.004	Valid	26
	38	0.74	Easy	0.521	Not Valid	
	39	0.87	Easy	0.553	Not Valid	
	40	0.15	Difficult	-0.014	Not Valid	
	41	0.76	Easy	0.004	Valid	27
	42	0.63	Medium	0.000	Valid	28

c. Research Instrument Analysis Based on Expert Judgments

Expert judgments the analysis of the research instrument's part Judgments consists of 2 lecturers in IPSE and one teacher from the school that used Curriculum 2013. The judgments for this research instrument are shown in Table 3.7.

Table 3.7 List of Instrument Judgments

No	Name	Occupation
1	J1	IPSE Lecturer (master's in biology)
2	J2	IPSE Lecturer (master's in biology)
3	J3	Expert of Science Teacher (Curriculum 2013)

The result of the instruments analysis by the judgments and the objective test needs some revision and improvement. The creativity rubric can be used to assess students' creativity in the project. The general comments from the expert judgments are shown as:

a. Revise some grammatical and typing errors
b. Add the source of the picture given in the questions
c. Revise some indicators of the question based on Bloom's taxonomy
d. Revised and improved some questions to fit the cognitive level category

3.6.2 Students' Creativity

The worksheet guided the creativity of implementing the electrical circuit project in learning activities. The worksheet contains some questions about the topic and the steps students take, which will assess whether students can do their projects. The implementation of creating an electrical circuit project by students was used to test students' concept mastery and creativity. This research used the Creativity Product Analysis Matrix (CPAM) Besemer and Treffinger (1981) developed. The data collected from students' creativity is based on a creative product made by students during electrical circuit project learning activities. The students' creativity is scored on a 1 to 3 scale for each criterion of three creative dimensions. The requirements used are germinal, original, valuable, useful, well-crafted, and expressive, described in Table 3.8 with the scale for each criterion.

Table 3.8 Criteria and scale of creative skills

Creative Dimension	Criterion	Score 1 (Lower)	2 (Medium)	3 (High)
Novelty	Germinal	The product is inspiring others with the creation	The product is inspiring others to try something new	The product is inspiring others to try something new by directly give ideas to develop more product design
	Original	Students primarily use the previous finding as their product idea	Students primarily use the previous finding as their product idea, but they modify the product	The product idea comes from their understanding
Resolution	Valuable	The product is not compatible with the purpose and not relate to the concept.	The product is compatible with the purpose and not relates to the concept	The product is compatible with the purpose and relates to the concept
	Useful	The product can be used once	The product can be used continuously with a specific requirement	The product can be used continuously without any requirement
Elaboration	Well crafted	The product is done well	The product is done well with	Students try to give interesting

Creative Dimension	Criterion	Score 1 (Lower)	2 (Medium)	3 (High)
			the good-looking design	product designs by using some materials
	Expressive	The product is presented with a lack of body language and a need to control speaking tone, which is not understandable	The product is presented with a lack of body language and need a controlled speaking tone, but it is understandable	The product is presented communicatively (using effective body language and a clear voice) and in an understandable manner

(Besemer and Treffinger, 1981)

3.6 Data Collection

3.6.1 Students' concept mastery

To collect the data of students' concept mastery will use objective test in the form of multiple-choice questions based on cognitive level dimension C1 until C6 of Bloom Taxonomy. The test will be spread out through printed questions on paper to make collecting to collect scoring research will be completed in the boarding school that implement curriculum 2013 which is not international-based school, therefore the test will be served by Indonesian language. The data will be collected on pretest and post-test to be compared to see whether there is an enhancement in students' concept mastery about human circulatory system topics after implementing electrical circuit projects through STEM-based learning.

3.6.2 Students' Creativity

Students' creative instruments will use a project of the human circulatory system model through a worksheet. Students will be introduced to the rubric criteria of the project that they must achieve. The assessment will be used during the learning process as the middle score and after learning as the final score to be compared with the middle score to determine whether there are improvements in students' creativity through making the project rubric shown in Table 3.8.

3.7 Data analysis

3.7.1 Students' concept mastery

Quantitative data is used to measure students' understanding of this research. The data will be collected through objective tests using multiple-choice questions. Suppose the data has been calculated for the score. In that case, the data will be analyzed to assess the influence of the electrical circuit project on students' concept mastery within the human circulatory system topic. The initial analysis test will use normality and homogeneity tests to identify the data eligible for subsequent analyses. This technique will be used for pretest and post-test questions.

1) Normality test

The normality test will be conducted to assess whether the data follows a normal distribution or not. Aligning with the opinion of Kartadinata and Abdurrahman (2012) cited by (Sharfina & Rigianti, 2023) states that "Data normality test is a form of testing about the normality of data distribution." Shapiro Wilk will examine the normality test on the pretest and post-test. The data will be analyzed by involving parametric tests to see if the data exhibits the normal distribution. The analysis will progress to a nonparametric test if a normal distribution does not follow the data. The criteria for performing the normality tests are:

- If the significance value is > 0,05, the data are declared as a normal distribution.
- If the significance value is < 0,05, the data are not declared as a normal distribution

2) Homogeneity test

To analyze whether the samples taken similar homogeneity tests will be conducted on the pretest and post-test scores. The homogeneity tests will be examined using *Levene Test.* The criteria of homogeneity tests are:

- If the significance value is > 0,05 the data interprets as homogeneous
- If the significance value is < 0,05, the data interprets as not homogeneous

3) Hypothesis test

Since hypothesis testing aims to find out the actual situation at the population level based on sample statistics, the unknown population parameters are estimated

using sample statistics. This research analyzes the hypothesis that was performed parametrically using an independent samples t-test when the data had a regular and homogeneous distribution. Otherwise, hypothesis testing is done nonparametrically using the Mann-Whitney U test when the data are not normally distributed and not homogeneous. The sequence of tests begins with the pretest. If the results show a significant difference, further testing of the post-test results is unnecessary, and the analysis proceeds directly to the N-Gain test. However, if the pretest results do not show a significant difference, the analysis continues by evaluating the post-test results. The N-Gain test is performed if the post-test results do not show a significant difference. Alternatively, if the post-test results significantly differ, the given treatment influences the measured variable.

a) Paired Sample T test

Following the normal distribution and homogeneity of the data, the next step involves the implementation of the T-test. A T-test will be conducted to ascertain the presence of significant differences between the results of pretest and post-test data. The criteria for T-test are:

- If the significance value is > 0,05, it cannot be interpreted as a significant difference
- If the significance value is < 0,05 can be construed as significance difference

b) N-gain test

Item scores that will be calculated from pretest and post-test items were analyzed to determine each student's score to see how effective learning is by examining the understanding by comparing the data. After the items are scored, the data is processed to determine score improvement and score progression. Each participant's gain from pretest to posttest can be calculated by subtracting the pretest score from each participant's posttest score (Meier and Vogt, 2015). Gain can be evaluated as the increase in student scores after correction. Hake recommends using normalized gain. Therefore, although this measure varies according to the studies in the literature, it allows “examination of different groups of students with different characteristics in advance”. This means that student learning outcomes are independent of population or pretest scores, allowing

educators to compare student learning outcomes with those of other students from different institutions. Normalized gains were introduced by Hake in 1998 to measure the effectiveness of a course in achieving understanding. The average normalized gain is defined as:

$$\langle g \rangle = \frac{{}^{0}/_{0}\, S_F - {}^{0}/_{0}\, S_i}{100 - {}^{0}/_{0}\, S_i}$$

Description:

<g> = Normalized gain

S_f = Post-test score

S_i = Pretest score

Average normalized gain (<g>) formulated:

$$\langle g \rangle = \frac{{}^{0}/_{0} < G >}{{}^{0}/_{0} < G > m_{ax}} = \frac{({}^{0}/_{0} < S_F > - {}^{0}/_{0} < S_i >)}{(100 - {}^{0}/_{0} < S_i >)}$$

Description:

<g> = Normalized gain

<G> = Actual gain

<G>max= Maximum gain possible

$<S_f>$ = Average of post-test score

$<S_i>$ = Average of pretest score

Table 3.9 N-gain interpretation

N-gain Score	Category
(<g>) > 0.7	High
0.7 > (<g>) > 0.3	Medium
(<g>) < 0.3	Low

4) Eta Squared Test

The Eta squared ($\eta 2$) is an effect size measure of the proportion of variation in the response variable that is attributable to the independent variables. In addition, it

measures the variance explained by the sample, not the population, which means that it will always overestimate the effect size. However, the bias gets smaller as the sample gets larger. The interpretation of eta squared can be seen in Table 3.10.

Table 3.10 The interpretation of eta squared test

η2 Value	Interpretation
$\eta^2<0.01$	Negligible
$0.01\leq\eta^2<0.06$	Small
$0.06\leq\eta^2<0.14$	Medium
$\eta^2\geq0.14$	Large

(Cohen, 1973)

3.7.2 Students' Creativity

Students' creativity will be assessed through the presentation of their project. The presentation will be carried out by two techniques; Gallery Walk with the concept peer assessment (Ridwan, 2019)and Demonstrative technique which will be carried out as an EXPERT ASSESSMENT concept carried out by the teacher. The assessment will be calculated using the formula below:

$$Percentage = \frac{Score\ obtained}{Total\ Score} \times 100\%$$

After obtaining the score from the scale calculation, the results will be categorized into five categories, interpreted as Table 3.11.

Table 3.11 Interpretation of creative category

Percentage (%)	Criteria
81-100	Very high
61-80	High
40-59	Sufficient
20-39	Low
0-19	Very low

(Sugiyanto, 2018)

3.8 Correlation Analysis

This research will use ANOVA, Multi Linear Regression, and MANOVA to analyze the correlation between dependent and independent variables. Which can be described as:

1) ANOVA

Analysis of variance is a statistical test like the t-test. However, the advantage of ANOVA is that it can test for differences in more than two groups.

Unlike the independent-samples t-test, which can only test for differences in the means of two groups. The interpretation of the data is:

- If the significance value is > 0,05, it cannot be interpreted as significant difference
- If the significance value is < 0,05, it can be construed as a substantial difference

2) Multilinear regression

Multiple linear regression analysis is used to predict the value of one variable based on the value of another variable. The variable used to predict the value of another variable is called the independent variable. Multi linear regression is a line or gap that minimizes the difference between expected and actual results. Statistical data is used to test whether the independent variable makes a significant contribution to the variable.

3) MANOVA

MANOVA (Multivariate Analysis of Variance) is a multivariate analysis technique used to compare the means of two or more groups on multiple dependent variables. It is used when there is more than one dependent variable so that several dependent variables can be analyzed simultaneously. The goal is to determine if there are significant differences between groups on multiple dependent variables.

There are several MANOVA test statistics: Wilks' Lambda, Pillai, Lawley-Hotelling, and Roy's Largest Root. Many statistical software programs present the calculation of the four MANOVA test statistics, and usually, the four test statistics produce the same conclusion. In cases when the four test statistics produce different conclusions in terms of accepting and rejecting hypotheses, the way that can be done is to test the eigenvalues and covariance matrix and evaluate the problem of the findings in the characteristics of the test statistics (Rencher, 2005).

3.9 Research Procedures

Several procedures are carried out in this study. Therefore, the procedures will generally be classified into three stages: the preparation stage, the implementation stage, and the completion stage. Each stage consists of several activities. Those three stages are explained below.

1) Preparation stage
   a. Identifying research problem
   b. Conducting a literature review on the Human Circulatory System topic, concept mastery, creativity and STEM learning
   c. Preparing research instrument.
   d. Validating research instrument by expert
   e. Revising research instruments
   f. Validating research instruments by students
   g. Arranging final research instruments
   h. Preparing lesson plan and worksheet
2) Implementation stage

Table 3.12 Implementation stage of teacher and students' activity

No	Stage		Teacher's Activity	Students' Activity
1	1st Meeting	Obtaining a formula as a basis for introducing the material	1. Greets and ask students to pray together	Greet teacher and pray together lead by chief of the class
			2. Checks students' attendance	Listen and tell the presence in class.
			3. Review the last topic and asked students to link it to today's topic	Listen and link the previous topic to the new topic
			4. Tells the learning objectives that must be achieved by students in this learning	Listen and understand the goals that must be achieved after learning.
			5. Ask students to fulfill the pretest.	Fill out the pretest completely.
			6. Gives a case related to the human circulatory system and asks some questions to check students' prior knowledge	Encourage to formulate questions related to the case and answer the questions from the teacher.
			7. Motivates to make students motivated to learn	Motivated to learn a new topic
2	2nd Meeting		1. Divides students to several groups and gives worksheet for each group	Re-arrange the table with the group given
			2. Explain the structure and function of circulatory system organs and guide	Listen to the teacher's explanation to fill out the worksheet.

No	Stage		Teacher's Activity	Students' Activity
			students to complete the worksheet.	
		Coming up with an idea	3. Asks students what is technology that duplicates the workings of natural systems like human body incredibly human circulatory system	Listen and think the exist technology that duplicate the workings of human body system.
			4. Introduces the electrical circuit project and explain the working concept of the project	Identify and link the concept of the project with the circulatory system concept in humans.
			5. Ask students to give the similarities of both components in their functions	Think and write the analogue of electrical circuit that has similar function with human circulatory system organs
3	3rd Meeting	Simulating and designing the idea	1. Gives students opportunity to make a circuit through web and sketch it on the worksheet	Make a circuit of electricity based on the human circulatory system and sketch a design project on the worksheet.
		Making The Project	2. It gives students another opportunity to make their circuit project in a group discussion	Each group tries to build their ideas to make a circuit project based on the the circulatory system.
			3. Monitors the discussion and gives some suggestions if it is needed	Each group does the discussion to design their ideas and make the project
4	4th Meeting	Testing The Project	1. Asks students to do a Gallery Walk Exhibition to visit and identify other groups' projects as the testing stage of their project. They allow to give some suggestions about the project.	Each group displays the results of the blood circulation circuit model on their respective tables, which have been arranged neatly and attractively. They identify others' projects and give the solution. They will divide their group member who should visit another group and stay at their table to present their project.
		Evaluation	2. Ask students to fix and solve the suggestions given by the teacher and others' groups about the project in their group	Fix and solve the suggestions given by the teacher and others' groups about the project in their group.

No	Stage		Teacher's Activity	Students' Activity
			3. Asks each group to present their project in front of the class that has been fixed to be assessed by the teacher and other groups. This was done to validate the assessment between friends.	Each group appears in front of the class to present the results of their project that has been fixed in turn and assess others' group projects.
5	5th Meeting		1. Ask students to share some of what they have learned. This can be done by asking a conclusion or some questions.	Generalize what has been learned
			2. Asks students to collect the worksheet	Collect the worksheet
		Closing	3. Ask students to do a post-test to validate their understanding of the topic	Fill out the post-test completely.
			4. Makes sure the topic given is precise by ask students if they still have something to ask and inform the Next's class activity	Ask questions if there is still something unclear and listen to the next activity.
			5. Close the class by pray together.	Close the class by praying together

(Widodo A, 2021)

3) Completion stage
   a. Analyze the data
   b. Discuss and conclude data of analysis result
   c. Arrange the report of the research

The scheme of 3 stages is shown as flowchart in Figure 3.1.

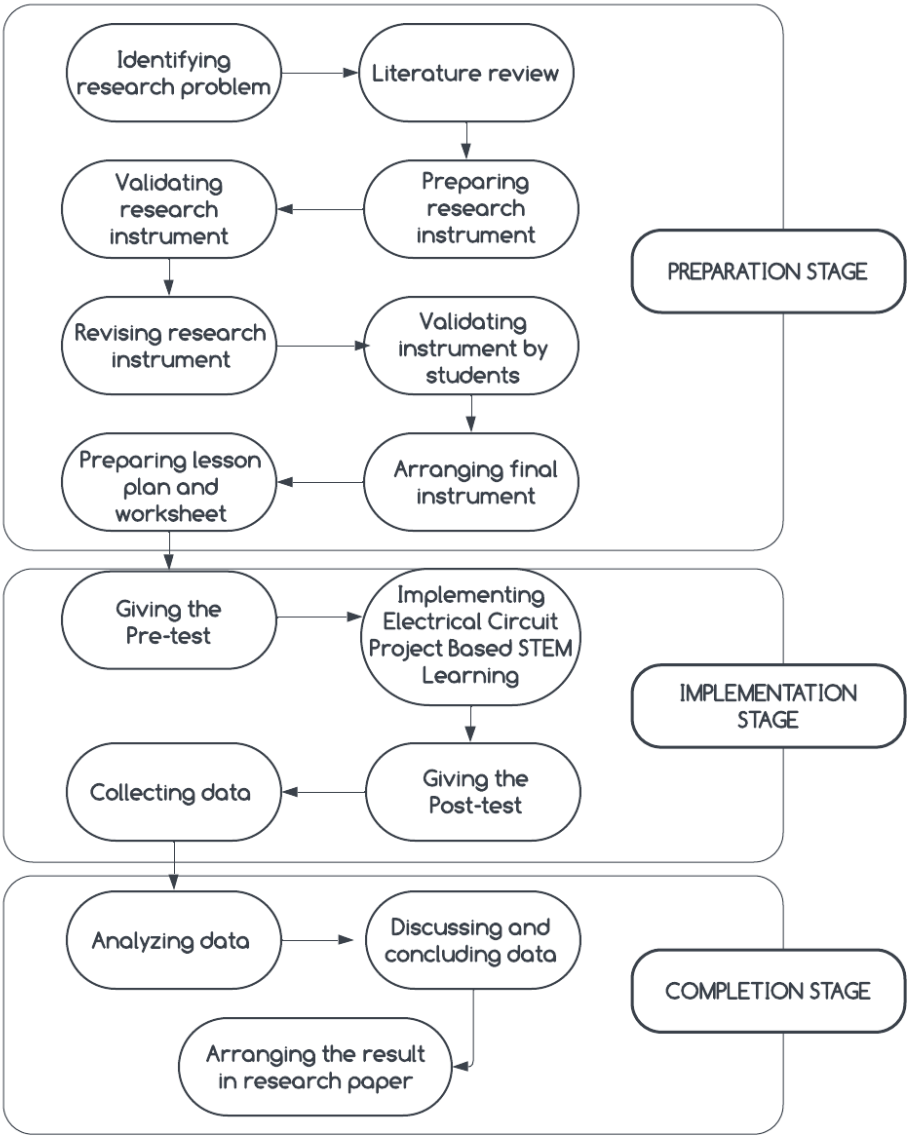

Figure 3.1 Flowchart of research