CHAPTER III

RESEARCH METHODOLOGY

3.1. Research Method and Research Design

a. Research Method

The method that used for this research is descriptive. Descriptive provides information about conditions, situations, events, that occur in the present (United Nations Educational, Scientific and Cultural Organization, 2005). While according to Gall and Walter (1983) descriptive studies are primarily concerned with finding out "what is", observational and survey methods are frequently used to collect descriptive data. This research is focused on students' creative disposition in learning Newton Law without considering toward students achievement. Besides that, the objects of research are not given any treatment.

b. Research Design

The design of research that used is the qualitative description. The researcher assigns two groups and conducts observations during teaching and learning process regarding creative disposition and students' creativity.

3.2. Population and Sample

The location of this research is Sekolah Menengah Pertama Negeri 1 Garut. The population of this research will be 8th-grade students at Sekolah Menengah Pertama Negeri 1 Garut. The samples are two class of 8th-grade students in Sekolah Menengah Pertama Negeri 1 Garut. The sampling technique will be cluster sampling based on Gall and Borg (1983) that the unit of sampling is not the individual but rather a naturally occurring group of individual. However Maolani and Cahyana (2015) state that in cluster sampling, a group that used as a sample is chosen randomly and all of the members who include that group automatically become sample.

3.3. Operational Definition

Students' creative disposition is measured by The Five Creative Dispositions Model which is inquisitive, persistent, collaborative, imaginative, and discipline (Lucas, Claxton, and Spencer 2014) during the lesson of Newton's Law. While students' creativity project is measured using creativity measurement tool which is novelty, usability, effectiveness and aesthetic value (Majid et al., 2015).

3.4. Research Instrument

In this research, the instrument is necessary to be used for gaining data. There is three types instrument that is used in this research which are an objective test, observation sheet, and students' creativity rubric. Those instruments are described below.

a. Questionnaire

The questionnaire is used to know student impression towards lesson that conducted. It is consist of 45 statements that will be responded by choosing the following five scale: very often, often, sometimes, rarely and never. The questionnaire should be responded by students after the lesson regarding Newton Law end. The content of this questionnaire is based on Lucas, Claxton, and Spencer (2014): inquisitive, persistent, imaginative, collaborative, and disciplined. The lattice of creative disposition questionnaire is shown in Table 3.1 as follows:

Table 3.1
The Lattice of Students' Creative Disposition Questionnaire

No	Dimension	Indicator	Item	Amount
1	Inquisitive	1. Wondering/ Questioning	1,2,3	3
		2. Exploring/ investigating	5,6,7	3
		3. Challenging assumptions	8,9,10	3
2	Persistent	a. Sticking with difficulty	10,11, 12	3
		b. Daring to be different	13,14, 15	3
		c. Tolerating	16,17,	3

No	Dimension	Indicator	Item	Amount
		uncertainty	18	
3	Imaginative	a. Playing with possibilities	19,20, 21	3
		b. Making Connections	22,23, 24	3
		c. Using intuition	25,26, 27	3
4	Collaborative	a. Sharing the product	28,29, 30	3
		b. Giving and receiving feedback	31,32, 33	3
		c. Cooperating appropriately	34,35, 36	3
5	Disciplined	a. Developing techniques	37,38, 39	3
		b. Reflecting critically	40,41, 42	3
		c. Crafting and improving	43,44, 45	3

(Lucas, Claxton, and Spencer 2013)

2. Students' creativity Product Rubric

Research on creativity often has three directions of impact: the creative product, the creative process, and the creative person (Hanke et al., 2011). In other words, student creativity is able to be seen by the product that can be made which is simple car toy. This simple product will be analyzed using students' creativity indicators named CMeT or creativity measurement tool that was adapted from Majid, Kassim and Razak (2015) which are a novelty, usability, effectiveness and aesthetic value. Every category has several elements which make the assessment very detail. This kind of creativity test assessed by giving a score on the rubric based on the result of product. The product will get score range 1 until 5. Higher score shows better result. The lattice of creativity measurement tool is shown in Table 3.2 as follows:

Table 3.2

The Lattice of Students' creativity Product Rubric

No	Category	Element
1	**Novelty** : Projects originality and newness in ideas, materials, processes (production of products) and concepts of making the product (Majid et al., 2015)	**Original:** Use of tools are original (made by students, there is no machine that bought), images and/ or characters are detailed, attractive, and relate to the content. **New:** The project contains many creative details and/or descriptions that contribute to the audience enjoyment. The creator has really used her/his imagination. **Obvious:** The concept that used in making the product is easily perceived or understood. **Valuable:** The project solving a problem that given. **Unexpected:** Very surprising and triggers high interests **Challenging:** The process to make the product is highly challenging
2	**Usability**: The appropriateness, functionality, and	**Learnable:** The product is clearly connected to the topic

No	Category	Element
	adaptiveness of the product to its targeted audience and purposes (Majid et al., 2015).	including appropriate materials that used. The information about the topic is complete. **Operable:** The product is able to operate **Practical:** The product is able to use based on the purposes. **Size:** The size of the product is proportional. **Dynamic:** The product is easily adapted and can be functioned in many different situations. **Material durability:** Durable for a long time
3	**Effectiveness**: Effective use of materials, processes, and solutions to problems of making the product (Majid et al., 2015)	**Cost:** The cost that used to make the product in accordance with the result. **Maintenance:** The maintenance of the product is very easy to be conducted and does not need special treatment. **Safety:** The process and materials that used are safety **Marketability:** The product that made is

No	Category	Element
		marketable
4	**Aesthetic value**: The stylistic components of the product which include design, artistic qualities (color, texture, details) and use of materials (Majid et al., 2015)	**Trendsetting:** A product that made in accordance with the current social design. **Organized:** The process of making the product is well organized. **Commercialization:** A product that made is able to introduce into commerce **Inspiring:** The product is highly inspiring others **Green:** The materials that used are green (recycle or eco-friendly) **Elegant:** A product that made has more values **Risk-taking:** The use of materials to make this product involves some risk-taking in order to achieve a goal.

(Majid, Kassim, and Razak, 2015)

3.5. Research Procedures

In order to have a good sequence systematically of the research, the research procedure is arranged in three stages. Those of three stages are preparation stage, implementation stage, and completion stage that will be explained below.

a. Preparation Stage

In this stage, the researcher focused on all of the preparation to conduct and support the research. Here are the steps of preparation stage.

1) Formulate problems to be investigated.
2) Determine the focus of variable research.
3) Conduct literature review of Creative Disposition Model.
4) Conduct literature review of students' creativity.
5) Conduct literature review of Newton Law topic.
6) Arrange the research proposal which is including chapter I, chapter II and chapter III which is presented in proposal seminar.
7) Revise of research proposal after having suggestions and critics from the lecturers.
8) Design the lattice to create the instrument.
9) Construct research instrument which is students' creative disposition questionnaire and students' creativity product rubric.
10) Test the validity, reliability of the questionnaire.
11) Report and make the validation of the research instruments.
12) Determine research population.
13) Prepare research license to schools.
14) Determine research sample which is randomly chosen 8b and 8d classes of SMPN 1 Garut.

b. Implementation Stage

This is the process of data collecting in the school when the treatments to students' are implemented, it consists of:

1) Conduct research activity by observing the creative disposition in the lesson.
2) Assessing students' creativity product in making simple car toy.
3) Deliver the questionnaire regarding students' creative disposition to 8b and 8c classes of SMPN 1 Garut.
4) Process the result of the questionnaire.

3. Completion Stage

This is the final stage of research design, the step that is conducted at this stage is explained as follows:

1) The whole data of the research were analyzed.
2) Discuss and conclude the data analysis result.
3) Arrange the research report.

3.6. Research Scheme

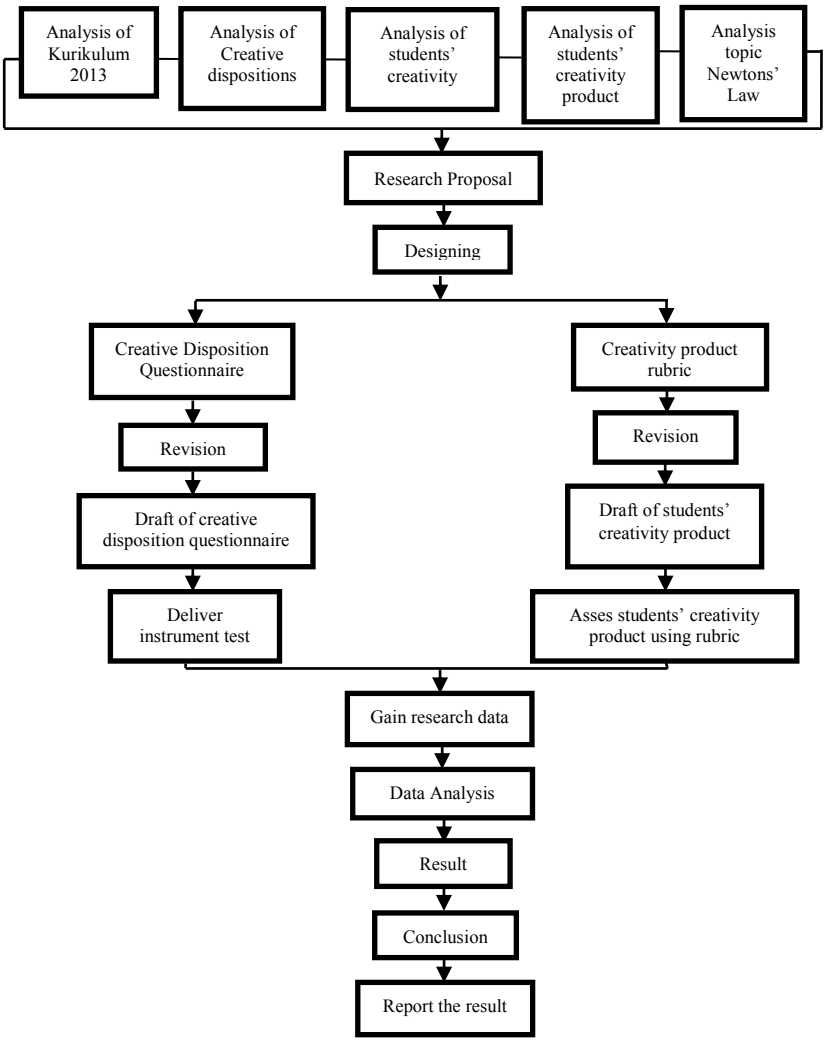

Figure 3.1 FlowChart of Research

3.7. Instrument Analysis Result

a. Recapitulation of Students' creative disposition Questionnaire

The questionnaire is consist of 45 statements regarding student creative disposition. The validity and reliability of the instruments were tested. The test was given to 42 students which have learned about the Newton Law topic.

1) Validity

United National Education Scientific and Cultural Organization (2005) state that a valid test or measure is one which measures what it is intended to measure. Kaplan and Saccuzzo (2012) describe that validity can be defined as the agreement between a test score and the quality to be measured.

The maximum validity coefficient (r_{12max}) between two variables is equal to the square root of the product of their reliabilities, or

$$r_{12max} = \sqrt{r_{11} r_{22}}$$

Where:

r_{11} and r_{22} are the reliabilities for the two variables

(Kaplan and Saccuzzo, 2012)

The validity interpretation is represented in the following Table 3.3.

Table 3.3
Validity Interpretation

Value *r*	Interpretation
$0.80 < r \leq 1.00$	Very high
$0.60 < r \leq 0.80$	High
$0.40 \leq r \leq 0.60$	Enough
$0.20 < r \leq 0.40$	Low
$0.00 < r \leq 0.20$	Very low

(Minium et al., 1993)

2) Reliability

United National Education Scientific and Cultural Organization (2005) state that a reliable test is a test which would provide a consistent set of scores for a group of individuals if it was administered independently on several occasions. While Bindak (2013) state that reliability is closely related to the variance of measurement hence reliability can be considered as the ratio of the variance of true scores to the variance of total scores.

$$\text{Re}liability = \frac{\sigma^2 true}{\sigma^2 total}$$

Where:

$\sigma^2 true$ = The variance of true scores

$\sigma^2 total$ = The variance of total scores

(Bindak, 2013)

The reliability interpretation is represented in following Table 3.4. below:

Table 3.4
Reliability Interpretation

Value *r*	Interpretation
$0.80 < r \leq 1.00$	Very high
$0.60 < r \leq 0.80$	High
$0.40 \leq r \leq 0.60$	Enough
$0.20 < r \leq 0.40$	Low
$0.00 < r \leq 0.20$	Very low

(Minium et al., 1993)

Based on validity and reliability test, this following table is shown the recapitulation of the test item analysis. Table 3.5 shows test item recapitulation:

Table 3.5
Students' creativity Product Recapitulation

No	Statement	r hitung	r table	Reliability (alpha 0.806)	Validity	Status
1	Statement number 1	0.433	0.304	Very high	Enough	Valid
2	Statement number 2	0.660	0.304	Very high	High	Valid
3	Statement number 3	0.479	0.304	Very high	Enough	Valid
4	Statement number 4	0.379	0.304	Very high	Low	Revised
5	Statement number 5	0.484	0.304	Very high	Enough	Valid
6	Statement number 6	0.687	0.304	Very high	High	Valid
7	Statement number 7	0.459	0.304	Very high	Enough	Valid
8	Statement number 8	0.555	0.304	Very high	Enough	Valid
9	Statement number 9	0.615	0.304	Very high	High	Valid
10	Statement number 10	0.431	0.304	Very high	Enough	Valid
11	Statement number 11	0.580	0.304	Very high	Enough	Valid
12	Statement number 12	0.555	0.304	Very high	Enough	Valid
13	Statement number 13	0.602	0.304	Very high	High	Valid
14	Statement number 14	0.555	0.304	Very high	Enough	Valid
15	Statement number 15	0.340	0.304	Very high	Low	Revised
16	Statement number 16	0.338	0.304	Very high	Low	Revised
17	Statement	0.557	0.304	Very high	Enough	Valid

No	Statement	r hitung	r table	Reliability (alpha 0.806)	Validity	Status
	number 17					
18	Statement number 18	0.377	0.304	Very high	Low	Revised
19	Statement number 19	0.684	0.304	Very high	High	Valid
20	Statement number 20	0.511	0.304	Very high	Enough	Valid
21	Statement number 21	0.506	0.304	Very high	Enough	Valid
22	Statement number 22	0.585	0.304	Very high	Enough	Valid
23	Statement number 23	0.639	0.304	Very high	High	Valid
24	Statement number 24	0.761	0.304	Very high	High	Valid
25	Statement number 25	0.613	0.304	Very high	High	Valid
26	Statement number 26	0.410	0.304	Very high	Enough	Valid
27	Statement number 27	0.424	0.304	Very high	Enough	Valid
28	Statement number 28	0.401	0.304	Very high	Enough	Valid
39	Statement number 29	0.556	0.304	Very high	Enough	Valid
30	Statement number 30	0.379	0.304	Very high	Low	Revised
31	Statement number 31	0.321	0.304	Very high	Low	Valid
32	Statement number 32	0.362	0.304	Very high	Low	Valid
33	Statement number 33	0.321	0.304	Very high	Low	Valid
34	Statement number 34	0.405	0.304	Very high	Enough	Valid
35	Statement	0.482	0.304	Very high	Enough	Valid

No	Statement	r hitung	r table	Reliability (alpha 0.806)	Validity	Status
	number 35					
36	Statement number 36	0.631	0.304	Very high	High	Valid
37	Statement number 37	0.627	0.304	Very high	High	Valid
38	Statement number 38	0.607	0.304	Very high	High	Valid
39	Statement number 39	0.537	0.304	Very high	Enough	Valid
40	Statement number 40	0.574	0.304	Very high	Enough	Valid
41	Statement number 41	0.524	0.304	Very high	Enough	Valid
42	Statement number 42	0.472	0.304	Very high	Enough	Valid
43	Statement number 43	0.435	0.304	Very high	Enough	Valid
44	Statement number 44	0.446	0.304	Very high	Enough	Valid
45	Statement number 45	0.410	0.304	Very high	Enough	Valid

b. Non-test Instrument

In this research, there is an instrument that is used to gain qualitative data which is The students' creativity of making simple car toy is assessed using Rubric of Creative Measurement Tools. Several criteria that available are existing in the rubric. The way of the observer to measure the students' creativity product is by fulfilled the rubric. The observer gave the score based on an indicator that has already made.

c. Correlation Between Students' creative disposition and Creative Product

According to Moore, Notz, and Flinger (2013), The correlation (r) measures the strength of the linear relationship between two quantitative variables.

Pearson r:

$$r = \frac{1}{n-1}\sum\left(\frac{x_i - \bar{x}}{s_x}\right)\left(\frac{y_i - \bar{y}}{S_y}\right)$$

1) r is always a number between -1 and 1.
2) $r > 0$ indicates a positive association.
3) $r < 0$ indicates a negative association.
4) Values of r near 0 indicate a very weak linear relationship.
5) The strength of the linear relationship increases as r moves away from 0 to -1 or 1.
6) The extreme values $r = -1$ and $r = 1$ occur only in the case of a perfect linear relations