CHAPTER III
RESEARCH METHOD

A. Research Design

A research is an activity which analyses and critically evaluates some problems. David Nunan said that a research is a process which involves defining a problem, stating an objective, and formulating an hypothesis. It involves gathering information, classification, analysis, and interpretation to see to what extent the initial objective has been achieved.[1]

Before doing research, first step which we must do is determining a research design. A research design offers the researcher a framework, some key concepts and ideas. Obviously, the research design which the researcher selects is going to affect the overall character of the research. The research design is often so persuasive that it will start to determine what to look at, how to collect data, and how to analyze it.

In this research, the approach used by the researcher was quantitative approach. Quantitative approach stressed the analysis to the numerical data that is processed by statistical method.[2] It is quantitative because the data will be gained are numeric and will be

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[1] David Nunan, *Research Methods in Language Learning,* (New York: Cambridge University Press, 1992), p.2.

[2] Burham Bungin, *Metode Penelitian Kuantitatif : Komunikasi, Ekonomi, Kebijakan Publik Serta Ilmu-Ilmu Sosial Lainnya,* (Jakarta: Kencana, 2010), p. 120.

analzed by using statistical computation. The method in this research was experimental research. An experimental method is an approach to educational research in which an idea or hypothesis is tested or verified by setting up situation in which relationship between participants or variables can be determined.[3] According to Brown as quoted by David Nunan, "an experimental research should exhibit several key characteristics. It should be systematic, logical, tangible, replicable, and reductive".[4]

There were two groups in this method, they were experimental group (X) and control group (Y). Both groups were given a pretest and a posttest. Pre-test was given to both groups before they are given treatment by the researcher. Post-test was given to both groups after they was given treatment by the researcher. In this research, new treatment was given to the students of experimental group..They are taught using The Little Mermaid film. Meanwhile, students of control groups were not taught simple past tense using The Little Mermaid film.

The researcher used pre test-post test control group design. Two groups were employed in this design. The pretest-posttest control group design could be diagrammed as shown below: [5]

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[3]Jack C. Richard and Richard Schmidt, *Longman Dictionary of Language Teaching and Applied Linguistics*, (London: Pearson Education Limited, 2002), p. 191.

[4]David Nunan, *Research Methods in Language Learning,*p.9.

[5]Suharsimi Arikunto,*Prosedur Penelitian Suatu Pendekatan Praktik,* Revised Edition, Vol. 14, (Jakarta; PT. Rineka Cipta, 2010), p.125.

<pre>
E   O1   X   O2
C   O3   Y   O4
</pre>

While:

E   : Experimental group

C   : Control group

O1   : Pre-test for the experimental group

O2   : Post-test for the experimental group

O3   : Pre-test for the control group

O4   : Post-test for the control group

X   : Treatment with "The Little Mermaid" film as an aid

Y   : Treatment without the film as an aid [6]

From the design above, subjects of research were grouped into an experimental group (top line) and a control group (bottom line). The quality of subjects was first checked by pre-testing them (01 and 03). The test was held in the form of composition. Firstly, the test was done in both groups, experimental and control group. Secondly, the result of the test was scored by using analytic scale. Thirdly, the means score of the two groups were determined. Finally, the two means were compared by applying t-test formula. T-test was used to differentiate if the students' result of grammar test by using film and without using film was significant or not.

If the obtained score was higher than t-table score by using 5% alpha of significance, Ho was rejected. It means that Ha was

[6]Ibnu Hadjar., *Dasar-dasar Metodologi Penelitian Kuantitatif Dalam Pendidikan,* (Jakarta: PT. Raja Grafindo Perasada, 1996), p.336

accepted if there was a significant difference in simple past tense achievement between the experimental and control group.

1. **Source of Data**

   a. **Setting**

   The research was conducted in SMP N 23 Semarang. It was located at street RM Hadi Subeno, Mijen, Semarang. The subjects of this research was the eighth grade students of SMPN 23 Semarang in academic year of 2012/2013. This research was in the second semester. The researcher has done the research on 24th March 2013 - 18th April 2013 and the description could be seen in the table below :

Table 3.1

Procedure and Timeline of Research

No	Activity	Month/Date							
		March					April		
		24th	26th	27th	28th	30th	11th	13th	18th
1.	Try-Out class	√							
2.	Experimental class								
a.	Pre-Test			√					
b.	Treatment I				√				
c.	Treatment II						√		
d.	Post test								√
3.	Control class								
a.	Pre-Test		√						
b.	Explaining I					√			
c.	Explaining II							√	
d.	Post test								√

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b. Population

Population was all members of well defined class of people, events or objects. The population of this research was the eighth grade of SMPN 23 Semarang in the academic year of 2012/2013. The eighth grade of SMPN 23 Semarang was divided into eight classes. There were some classes. Those are VIII A, VIII B VIII C, VIIID, VIII E, VIIIF, VIII G, and VIII H. The population of the students of SMPN 23 Semarang could be seen as follow:

Table 3.2

List of the Eighth Grade Students

Class	Male	Female	Total
VIII A	18	22	40
VIII B	21	17	38
VIII C	14	20	34
VIII D	23	17	40
VIII E	21	14	35
VIII F	19	17	36
VIII G	15	20	35
VIII H	18	14	32
Total	149	141	290

c. Sample and Sampling Techique

Arikunto said, "sample is a representative of population which is studied. It is subject of population".[7] She also said that sampel can be taken between 10% - 15% - 25% if the number of population is more than 100.[8] It is called sample research when we want to generalize the sample research result. David Nunan also said, "sample is a subset of individuals from a given population".[9]

The researcher selected two groups of students from the population as sample of research. In this study, there are two classes as sample. The process of selection used cluster random sampling technique. It was a technique to choose a sample by spoiling each class (population) and it was based on lottery. Finallly, the researcher choose VIII G as the experimental class that consists of 35 students and VIII F as the control class that consists of 36 students.

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[7]Suharsimi Arikunto,*Prosedur Penelitian Suatu Pendekatan Praktik,* Revised Edition, p.130.

[8]Suharsimi Arikunto,*Prosedur Penelitian Suatu Pendekatan Praktik,* Revised Edition, p.125.

[9]David Nunan, *Research Methods in Language Learning,* p.27.

2. Variable

Variable is the object of research or something that became the concern of research.[10] Fred D. Kerlinger as cited by Arikunto said, "variable is all experiments have one fundamental idea behind them; to test the effect of one or more independent variables on a dependent variable (it is possible to have more than one dependent variable in experiments)".[11]

In this study, there were two variables, those variables were;

a. The independent variable (X)

Independent variable is variable that the experimenter expects to influence the other.[12] The independent variable in this research was the use of 'The Little Mermaid' film as a medium in teaching simple past tense. The experimental group taught simple past tense using the film while the control group taught simple past tense without the film.

The indicators were as follow:

1) Understand simple past tense well.

2) Identify the verbs in simple past tense.

3) Make sentences with the verbs in simple past tense.

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[10]Ibnu Hadjar.*Dasar-dasar Metodologi Penelitian Kuantitatif Dalam Pendidikan,* p. 51.

[11]Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, p. 162.

[12] David Nunan, *Research Methods in Language Learning*, p.25.

b. The dependent variable (Y)

Dependent variable is variable upon which the independent variable is acting.[13] Sugiyono said,"dependent variable is variable that is affected resulting, because of the existence of independent variable".[14]Based on the definition above, the dependent variable in this study was the students' score understanding of grammar test about the material of simple past tense.

The indicators were as follow:

1) Identify the use of simple past tense.

2) Identify the pattern of simple past tense.

3) Make sentences based on the pattern of simple past tense well.

3. **Data Collection Technique**

The researcher must use instrument to get the better data. The instrument of the research is a tool or facility that is used by researcher for collecting data in order to get better result. To get the accurate data, in this study the researcher choose some instruments for collecting the data, they were:

a. Test

In this research, the researcher used test to collect data. Brown states, "test is as a method which is used to

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[13]David Nunan, *Research Methods in Language Learning,* p.25.

[14]Sugiyono, *Statistik Untuk Penelitian,* (Bandung: CV. Alfabeta, 2008), Vol. 3, p. 4.

measure competence, knowledge, intelligence, and ability of talent which is possessed by individual or group to collect data".[15] Test is an examination or trial to find its quality, value, composition, etc.[16] The test was used to collect the students' writing that must be analyzed to identify the students' understanding on simple past tense. The form of test in this study was objective test. Objective test was a test which is organized where in each question the writer prepares an alternatif answer. [17] Objective test was frequently criticized on the grounds that they are simpler to answer than subjective test. Objective tests wee divided into transformation, completion, combination, addition, rearrangement, matching, correct and incorrect (true/false) and multiple choice.[18] The researcher used two test types of the objective test, they were multiple-choice and completion test.

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[15]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* (San Fransisco: Longman, 2004), p. 3.

[16]Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik , Edisi Revisi,* p.266.

[17]Nurul Zuriah, *Metodologi Penelitian Sosial dan Pendidikan,* (Jakarta: PT Bumi Aksara, 2006), p. 184.

[18]Ngalim Purwanto, *Prinsip - Prinsip dan Teknik Pengajaran,* (Bandung: PT. Remaja Rosda Karya, 2002), 11th Ed., p. 35-36.

The researcher used multiple choice forms. The choice of the test type is based on the consideration that multiple choice test are:[19]

1) The technique of scoring is easy.

2) It was impossible for students to avoid the grammar point being evaluated.

3) This is sensitive measure of achievement multiple-choice language test; it allows teachers to diagnose the students' problems.

In this research, the researcher used pre test and post test, they are follows:

1) Pre-test

Before the teacher taught new material by using film, the teacher gave pre test to the students. Pre- test was given to the experimental class and the control class before the treatments was run.

2) Post-test

Post-test was held after all treatments were conducted. Post-test was given to the experimental class and control class after received treatments. Post test was used for measuring the improvement of students' understanding on simple past tense after being taught by using film in experimental class, and without using film

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[19]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* p. 43.

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in the control class.In this case, students were asked to do the objective test.

The score of students' achievement can be calculated by using this following formula:[20]

$$Score = \frac{The\,number\,of\,right\,answer}{The\,number\,of\,questions} x100\%$$

b. Documentation

The documentation method is used to look for the data concerning matters or the variable that took from of the note, transcript, book, newspaper, magazine, inscription, ledger, agenda, etc.[21] Documentation is the other way to get data from respondent. In documentation, the writer got data from both written resource from respondent and a place where the respondent lived. Thus, a researcher had to use both of the documentation resources accurately, in order to get real informations. It refers to the archival data that helps the researcher to collect the needed data.

In this research, the researcher got the data from the school. While during the experiment, the researcher got the documentation from the teacher's note. The researcherused

[20]Suharsimi Arikunto,*Prosedur Penelitian Suatu Pendekatan Praktik,* Revised Edition, p.235.

[21]Suharsimi Arikunto, *Prosedur Penelitian: Suatu Pendekatan Praktik*, Revised Edition, p. 158.

the document related to the object research such as students name list and the English subject schedule.

The researcher got the syllabus, lesson plan of teaching and learning process, report of students' development, teachers' name list, and sketch of SMPN 23Semarang in the academic year of 2012/ 2013. The documentation is used to know data of the students and teachers in the school. To get the result of documentation easily and systematically, the data was gained by the help of English teacher and administration officers.

4. Data Analysis Technique

a. Try Out-Test

A try out test is the result will be used to make sure that the measuring instrument has such characteristics as validity and reliability of instrument test. The instrument to be tried out is the composition test. The result of test will be used to find out the validity and reliability, difficulty level and also the discrimination power of each item.[22]

1) Validity

The validity is an important quality of any test. It is a condition in which a test can measure what is supposed to be measured.Validity is concerned with the extent to which descriptions of events accurately capture

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[22]Suharsimi Arikunto,*Prosedur Penelitian Suatu Pendekatan Praktik* Revised Edition, p.167.

these events[23]. The validity of an item can be known by doing item analysis. It was counted using product – moment correlation formula:

$$r_{xy} = \frac{N \sum XY - \sum (X) \sum (Y)}{\sqrt{\left\{ N \sum X^2 - \left(\sum X \right)^2 \right\} \left\{ N \sum Y^2 - \left(\sum Y \right)^2 \right\}}}$$

r_{xy}: : The correlation coefficient between X variable and Y variable

N   : The number of students

X   : The number of each item score

Y   : The number of total score

Calculation result of r_{xy} is compared with r $_{table}$ of product moment by 5% degree of significance. If r_{xy} is higher than r $_{table}$, the item of question is valid.[24]

2) **Reliability**

Reliability means "consistent and dependent".[25] Besides validity, a good test should have reliability as well. Reliability is necessary characteristic of any good test. Reability concerns the extent to which a particular

[23]Graham Hitchcock and David Hughes, *Research and The Teacher: A Qualitative Introduction to School-Based Research,* (New York: Routledge,1995, p. 105.

[24]Suharsimi Arikunto*., Prosedur Penelitian Suatu Pendekatan Praktik Edisi Revisi*. p. 226.

[25]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* p.20.

technique will product the same kinds of results, however, whenever, and by whoever it is carried out.[26] The method is used to find out reliability involved scoring of first and last part of the items separately by making table. To get the coefficient of correlation, the researcherapplied the *product-moment* formula and then continued to the *spearman-brown* formula. The formula of product moment as follow:

$$r_{XY} = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{\left\{N\Sigma x^2 (\Sigma x)^2\right\}\left\{N\Sigma y^2 (\Sigma y)^2\right\}}}$$

In which,

r_{XY} : Coefficient of correlation between the scores of the first and last part of the items.

N : The number of students / subject participating in the test/ testee.

Σ_X : The score of first part.

Σ_Y : The score of last part.[27]

After finding r_{XY} the computation was continued to the *spearman-brown* formula as follow:

[26]Graham Hitchcock and David Hughes, *Research and The Teacher: A Qualitative Introduction to School-Based Research*, p. 107.

[27]Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik Edisi Revisi*, p. 181.

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$$r_{11} = \frac{2 \times r_{xy}}{1 + r_{xy}}$$

In which,

r_{11} : The reliability of the instrument.

r_{xy} : Coefficient of the correlation between the first

and last part.[28]

Calculation result of r_{11} is compared with r_{table}

of product moment by 5% degree of significance. If r_{11} is

higher than r_{table}, the item of question is reliable.

3) **Degree of Test Difficulty**

A good question is a question that is not really
difficult and not really easy. Formula for degree of test
difficulty is:[29]

$$FV = \frac{R}{N}$$

In which,

FV :   The index of difficulty.

R :   Number of students who answered the item

correctly.

[28]Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik* Revised Edition, p.180.

[29]Ngalim Purwanto, *Prinsip-Prinsip dan Teknik Pengajaran,* (Bandung: PT. Remaja Rosda Karya, 2002), 11th Ed. p.119.

N :   Number of students.[30]

The level of difficulty of each item was determined by using this following categorization:

FV $\leq$ 0.00   : very difficult.

0.01 - 0.30   : difficult.

0.31 - 0.70   : medium.

0.71 - 1.0   : easy.

FV $\geq$ 1.0   : very easy.[31]

4) Discriminating Power

The discriminating power is a measure of the effectiveness of a whole test. It is used to know how accurate the question differ higher subject and lower subject.[32] The formula for discriminating power is Split Half:

$$D = \frac{Correct\ U - Correct\ L}{N}$$

In which,

D :   The discrimination index.

U :   The number of the students in the upper group who answered item correctly.

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[30]Harold S. Madson,*Technique in Testing,* (USA: Oxford University Press. Inc., 1983) p. 181.

[31]Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan, Revised Ed.,* (Jakarta: Bumi Aksara, 2002), Vol. 3, p. 207.

[32]Ngalim Purwanto, *Prinsip-prinsip dan Teknik Pengajaran,* p.120.

L   :   The number of the students in the lower group who answered item correctly.

N   :   The number of the students who answered correctly in one group.

The criteria of discriminating power as follow:

$D \leq 0.00$: Very Poor.

0.01 - 0.20   : Poor.

0.21 - 0.40   : Medium.

0.41 - 0.70   : Good.

0.71 - 1.00   : Excellent.[33]

b. Pre-Test

Pre-test was given before the treatments. The researcher determined the statistic analysis technique whether groups that have normal distribution. If the data have normal and homogeneity distribution, the treatment and teaching can be conducted to both classes.

1) Normality Test

It is used to know the normality of the data that is going to be analyzed whether groups that have normal distribution or not. The normality test with Chi-square was done to find out the distribution data.

Step by step Chi-square test is as follows:

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[33]Harold S. Madson, *Technique in Testing,* p.183.

a) Determine the range (R); the largest data reduced the smallest.

b) Determine many interval classes (K) with formula:

K = 1+ (3, 3) log n

c) Determine the length of the class, using the formula:

$$P = \frac{range}{number of\ class}$$

d) Make a frequency distribution table.

e) Determines the class boundaries (bc) of each class interval.

f) Calculating the average Xi ($\overline{X}$), with the formula:

$$\overline{X} = \frac{\sum f_i x_i}{\sum f_i}$$

g) Calculate variants, with the formula:

$$S = \sqrt{\frac{\sum f_i (x_i - \overline{x})^2}{n-1}}$$

h) Calculate the value of Z, with the formula:

$$Z = \frac{x - \overline{x}}{s}$$

x = limit class

$\overline{x}$ = Average

S = Standard of Deviation

i) Define the wide area of each interval

j) Calculate the frequency expository (Ei), with formula:

Ei = n x wide area with the n number of sample

k) Make a list of the frequency of observation (Oi), with the frequency expository as follows:

Class	Bc	Z	P	L Wide area	Ei	Oi	$\dfrac{Oi - Ei}{Ei}$

l) Calculate the chi-square (X^2), with the formula:

$$X^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

m) Determine dk = k-3, where k is the number of class intervals and $\alpha = 5\%$

n) Determining the value of X^2 table

o) Determining the distribution normality with test criteria:

If $X^2{}_{count} > X^2{}_{table}$ so the data is not normal distribution and the other way if the $X^2{}_{count} < X^2{}_{table}$ so the data is normal distribution.[34]

2) Homogeneity Test

It was meant to get the assumption that sample of research came from a same condition or homogenous. It is used to know whether experimental class and control

[34]Sudjana., *Metode Statistika,*(Bandung: Tarsito, 1996), p. 272

class, those are taken from population that have same variant or not.

The steps as follows:

a) Calculate variants both classes (experimental and control classes), with the formula:

$$S_1^2 = \frac{\sum(x-\bar{x})^2}{n_1-1} \text{ And } S_2^2 = \frac{\sum(x-\bar{x})^2}{n_2-1}$$

b) Determine $F = \dfrac{Vb}{Vk}$

Where:

Vb : Bigger Varian

Vk : Smaller Varian

Determine dk = $(n_1 - 1):(n_2 - 1)$

c) Determine F_{table} with $\alpha = 5\%$

d) Determining the distribution homogeneity with test criteria:

If $F_{count} > F_{table}$, the data is not homogeneous and the other way if the $F_{count} < F_{table}$, the data is homogeneous.[35]

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[35]Sugiyono, *Statistika Untuk Penelitian,* (Bandung: CV. Alfabeta, 2008), Vol. 13, p. 140.

3) Test of the Average

It is used to examine average whether experimental group and control group have been decided having different average. [36]

T-test is used to analyze the data of this research. A t-test would be the measure and you would use to compare the mean scores of the two groups.[37]

If $\sigma_1{}^2 = \sigma_2{}^2$ (has same variant), the formula is:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S\sqrt{\dfrac{1}{n_1} + \dfrac{1}{n_2}}}$$

With

$$S = \sqrt{\frac{(n_1 - 1)S_1{}^2 + (n_2 - 1)S_2{}^2}{n_1 + n_2 - 2}}$$

Where:

$\overline{X}_1$:   The mean score of the experimental group

$\overline{X}_2$:   The mean of the control group

n_1 :   The number of experimental group

n_2 :   The number of control group

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[36]Anas Sudjono, *Pengantar Statistik Pendidikan*, (Jakarta: PT. Raja Grafindo Persada, 1995) 6th Ed., p. 326-327.

[37]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* p. 205.

$S_1{}^2$: The standard of deviation of experimental group

$S_2{}^2$: The standard of deviation of both groups

If : $\sigma_1{}^2 \neq \sigma_2{}^2$ (has no same variant) the formula is:

$$t^1 = \frac{\overline{X} - \overline{X}_2}{\sqrt{\dfrac{S_1^2}{n_1} + \dfrac{S_1^2}{n_2}}}$$

The hypotheses are:

$Ho = \mu_1 = \mu_2$

$Ha = \mu_1 \neq \mu_2$

μ_1 : average data of experimental group

μ_2 : average data of control group

If $t_{count} > t_{table}$ so Ho is rejected and there is no difference of average value from both of groups. Moreover, the other way if the $t_{count} < t_{table}$ so Ho is accepted and there is significant difference of average value from both of groups.[38]

c. **Post-Test**

Post-test was held after all treatments were conducted. This test was used to measure students' achievement after they were given treatments. The result of test was analyzed statistically.

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[38]Anas Sudijono, *Pengantar Statistik Pendidikan*, ,p.272-273.

1) Normality Test

   Steps normality second step is the same as the normality test on the initial data.

2) Homogeneity Test

   Steps homogeneity second step is the same as the homogeneity test on the initial data.

3) Test Average (Right-hand Test)

   This test proposes that hypothesis test in average is similar with the right test as the steps right-hand test the initial data.