CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter consisted of the nature of writing, writing process, writing a paragraph, the structure of paragraph, the elements of paragraph, ESL writing, writing ability, feedback, peer correction, teacher written feedback, an experiment study and analysis of variance (ANOVA).

A. The Nature of Writing

Naturally, language learners acquire a language starting from the listening activity. Afterward, they come to the speaking activity. Gradually, they move to the reading activity. When language learners write, they are engaged in an activity, which is usually at the same time both private and public. It is private because the act of composition is by its nature solitary. However, it is also public in that most writing is intended for an audience. When language learners write, they usually have someone in mind that will read what they wrote. They write notes, diary, memos, reports, and letters to others, here, they also have a purpose to write.²¹

Writing is amongst the most prominent skills that language learners need to learn as an essential component of their academic practice and later on in their professional life, which partially explains why teaching writing

has prompted a good deal of research that covers various aspects of its broad instructional contexts.22

Dulay stated that writing is only one mode in which both linguistics manipulation task and communication task have been given.23 According to Fauziati, writing as a process is oriented towards work in progress and development of new skills, rather than merely evaluative task, the classroom practices, therefore, will vary from each other.24

In addition, when language learners start to write, they use graphic symbols to express ideas. Graphic symbols can be letters or combination of letters. They also go through a process of creating and recreating a piece of writing until they are able to express ideas clearly. In this sense, writing is a process of arranging the graphic symbols according certain convention or requirement to form words and then words will be produced into a sentence. To prepare to write, some writers make draft, sketch, and cluster related ideas or outlines.

As students write, they put ideas into draft form; they also take breaks to read the draft. They reflect on whether or not their writing reveals their intended meaning. They should also consider the purpose and audience. As they read over the draft, they may cross out paragraphs, sentences, and words. They also rearrange the way they present ideas, and

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jot down notes about how to revise writing. They continue to write and read and change the draft until they are satisfied with the piece of writing.25

Based on the definition above, it can be stated that writing is an activity of someone to write something as like notes, diary, memos, reports, letters, etc to others from words become sentence.

B. Writing Process

Jarum et al. in Littell divides the process writing into four stages: prewriting, writing a first draft, revising, and preparing the final composition.26 In other hand, Alice Oshima and Ana Hague said that there are four main stages in the writing process prewriting, organizing, writing and polishing (revising and editing).27 In addition, Gebhard mentions the four stages of the process writing: prewriting, drafting, revising, and editing.28

Following the study, the process writing stages include prewriting (planning), whilst writing (including drafting and revising) and post writing (including editing, final draft and proofreading). In details, the three stages are presented below.

The first stage is Prewriting involves everything the writer does

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26 Jarum and Sabarun, Laporan Penelitian Dosen Muda Improving Students’ Writing Ability Through Cooperative Learning Strategy at the English Department of University Malang, Universitas Muhammadiyah Malang, 2007, p. 8.
before beginning the actual task of writing, including activating background knowledge, generating ideas, and making plans for approaching the writing task. In the prewriting stage, a writer decides the interesting topic. Prewriting covers a wide variety of activities. There are numerous prewriting techniques that the writers can use to generate ideas as they begin to write, namely: listing, clustering, brainstorming, strategic questioning and free writing.29

Listing is a prewriting technique in which a writer list down on a paper as many thoughts as he has and as quickly as he can. The ideas or thoughts related to topic that comes out from the mind of the writer are listed and they become the basic source of information for the writing.

Clustering or word mapping is a prewriting technique of making a visual map of ideas. In clustering, the writers use a key word placed in the center of a page, then, jot down all the free associations.30

Brainstorming is also a good technique to generate ideas and to get information that a writer needs. Jarum et al. in Smalley, et al. states that brainstorming is a way to associate and stimulate thinking. It permits writers to approach a topic with an open mind.31

Strategic questioning lets the writers consider the topic through a series

31 Jarum and Sabarun, Laporan Penelitian Dosen Muda Improving Students’ Writing Ability Through Cooperative Learning Strategy at the English Department of University Malang, Universitas Muhammadiyah Malang, 2007, p.15.
of question. Here, the writers answer a set of questions designed to guide the writing, such as “what do you want to write about?” “what is your goal?” what do you need to find out?” here, writer are given chances to consider what they know and need to learn about the writing topic.

Free writing is writing freely without stopping, letting thoughts flow without regarding to connection and direction whether an idea makes sense or not. Free writing provides writers with chances to put ideas into writing. Here, a writer can write freely whatever comes to his mind. The writer can write freely, starting with a bank sheet a pen and letting thought flow without worrying about grammar and word choice. It is a way of releasing and stimulating the power of thought and imagination.  

The second stage is whilst writing, which includes drafting and revising. After having generated idea, a writer needs to write the first draft. Jarum et al. in Mc Crimmon states that drafting is a series of strategies designed to organize and develop a sustained piece of writing.  

As they compose. The writer begins to determine what to include and exclude, and make initial decisions about how these ideas will be organized. While writing first draft, the writer should focus on getting meaning down on paper; but they should not be overly concerned with grammatical correctness. In the process of writing, drafting is viewed as an

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important strategy. Drafting is the core of writing process.  

The next step after drafting is revising. Revising is process of rethinking and changing what is written. Jarum et al. in D’Angelo states that revision is making improvement on the original paper by arranging and reorganizing ideas, rephrasing sentences, deleting and adding completely new material. In revising, writers rethink and rewrite the first draft forming the second draft. Sometimes ideas are added and sometimes are omitted.

The third stage is the post writing (including editing, final draft and proofreading). Editing paragraph is the last stages in the process of writing. Editing refers to correcting grammatical errors, rewriting misspelled word, and changing punctuation.

In this stage, the writers are required to proof-read the composition (final draft) for grammatical and sentence structure errors. Here, the writers turn their attention from the major substance of paragraph to its conventional features (spelling, capitalization, and punctuation).

In addition, the writers can do proofreading activity individually or in pairs using editing guideline. Proofreading is a unique type of reading in which students read slowly, word by word, hunting for error rather reading quickly for meaning. This activity takes place before the final product.

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34 Jarum and Sabarun, *Laporan Penelitian Dosen Muda Improving Students’ Writing Ability Through Cooperative Learning Strategy at the English Department of University Malang*, p. 16.


36 Jarum and Sabarun, *Laporan Penelitian Dosen Muda Improving Students’ Writing Ability Through Cooperative Learning Strategy at the English Department of University Malang*, p.13.

The next step is publishing, which is the time for students to prepare their final composition to be shared with audience, such as classmate, group member, or teachers. Through this stage, the students communicate with genuine audience who respond the writing in meaningful way.38

C. Writing a Paragraph

A paragraph is a series of sentence developing one topic. Alice Oshima and Ann Hogue stated that “a paragraph is a group of related statements that a writer develops about a subject”.39 In other hand, Jack C. Richards and Ricard Schmidt stated that “a paragraph is a unit of organization of written language in many languages, which serves to indicate how main the ideas in a written text are grouped”.40

Based on the definition above, it can be stated that a paragraph is a group of sentences dealing with a single topic or idea.

There are several kinds of paragraphs; one of them is a narrative. To write a good narrative paragraph, a writer should follow some steps. Jarum et al. in Littell points out there are three steps to write a narrative paragraph, namely: prewriting, first draft and revision. In pre-writing, a writer selects the general topic and narrows it, then, organizes the details using chronological order. In the first draft, a writer refers to the pre-writing notes and uses the transitional words and phrases to help him/her

38 Jarum and Sabaran, Laporan Penelitian Dosen Muda Improving Students’ Writing Ability Through Cooperative Learning Strategy at the English Department of University Malang, Universitas Muhammadiyah Malang, 2007, p. 11.
recreate the flow of events. In revision, a writer goes over the rough draft several times. A writer must check the draft: “Are the details logically organized? Do any details need to be added or deleted?”

In contrast, Jarum et al. in Ezor and Lewis argues that propose five steps for building the paragraph. The first is selecting the topic. The second is writing a general statement (topic sentence) about the topic. The third is jotting down possible details about the topic. The fourth is developing those details into supporting sentences. The fifth is reading the whole paragraph and make whatever changes writers feel will improve their writing.

Dealing with the paragraph writing, the first essential step is to select the topic. The second step is to write a topic sentence about the topic and provide details about the topic. The next step is to develop those details into supporting sentence using facts, evidence, example, and so on. The last step is to write the final draft.

D. The Structure of Paragraph

There are three parts of paragraph, topic sentence, supporting sentences, and concluding sentences:

1. Topic sentence

Topic sentence is the most important sentence in a paragraph. Based on Alice Oshima Ann Hogue, topic sentence has two parts: a topic and

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controlling idea. The topic names the subject of paragraph. The controlling idea tells what the paragraph will say about the topic. It is called the controlling idea because it controls or limits the topic to a very specific point or points. Here are examples of topic sentences with the same topic but different controlling idea:

a. Some marriages are a union of two individual

b. Some marriages take a place in unusual locations.

The position of topic sentence is usually in the first sentence in the paragraph. But can be in the last paragraph also. A topic sentence at the beginning of paragraph gives readers an idea of what they will read. This helps them understand the paragraph easily.

2. Supporting Sentence

Supporting sentences explain the topic by giving more information about it.

Example:

“Owning a small car has several advantages. First a small car is easier to park. Second economical BBM”.

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45 Ibid, p. 44.
The sentence “First a small car is easier to park. Second economical BBM” is called supporting sentence. Because it gives more information about the topic (Owning a small car has several advantages).46

3. Concluding Sentence

A concluding sentence is a sentence that reminds the reader about the main idea. Based on Alice Oshima Ana Hogue states that a concluding sentence signals the end of the paragraph and reminds the reader of the main idea.47

There are some tips to write a good concluding sentence, based on Alice Oshima Ann Hogue’s book “Introduction to Academic Writing”, they are:

a. Begin with a conclusion signal. Most conclusion signals have commas after them; others do not:

<table>
<thead>
<tr>
<th>Followed by a comma</th>
<th>No Comma</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All in all,</td>
<td>1. It is clear that.......</td>
</tr>
<tr>
<td>2. In brief,</td>
<td>2. These examples show that.......</td>
</tr>
<tr>
<td>3. In conclusion,</td>
<td>3. You can see that.....</td>
</tr>
<tr>
<td>4. Indeed,</td>
<td></td>
</tr>
<tr>
<td>5. In short,</td>
<td></td>
</tr>
<tr>
<td>6. In summary,</td>
<td></td>
</tr>
<tr>
<td>7. To conclude,</td>
<td></td>
</tr>
<tr>
<td>8. To summarize</td>
<td></td>
</tr>
</tbody>
</table>

Example:
1. To summarize, Japanese food is both beautiful to look at and delicious to eat.
2. Indeed, many U.S cities and regions have a special food for everyone to enjoy.

Example:
1. It is clear that fad diets don’t work and may even damage a dieter’s health.

b. Remind the reader of the main idea by one of the following methods.

1) Repeat the idea in the topic sentence in different words. Do not just copy the topic sentence. Example:

“Successful bidding on eBay requires patience and strategy”.

In conclusion, wait patiently and place your bid with precision timing and you will be the winning bidder every time.

2) Summarize the main points of the paragraph.

In conclusion, follow the steps I have outlined, and you will be the winning.

c. Never end the paragraph by introducing a new idea.48

E. The Elements of Paragraph

In addition to the paragraph writing, a paragraph should have the elements or the qualities of a good paragraph: unity, coherence, completeness, and order.

1. **Unity**

Unity means that the ideas of the supporting sentences are all clearly connected to the main idea. In other words, all the details are relevant to the one controlling idea. Unity in a paragraph requires consistent development of the idea that our paragraph intends to explain.

The paragraph as a whole should focus on one idea. The best way to keep the paragraph unified is to be sure of what writers intended to do. One way to make the intention clear is to begin with a topic sentence. By beginning paragraph with a topic sentence writers immediately signal to their readers the main idea that they will develop in that paragraph. All in all, the points that make related in the writing are called unity of the paragraph.

2. **Coherence.**

Coherence means, “sticking together”. A paragraph is coherent when the sentence are woven together in such a way that our reader can move easily from one sentence to the next and read the paragraph as an integrated whole. In other words, coherence is one important thing in writing is connected between one sentence and other.

3. **Completeness**

Completeness means that writers must provide a complete explanation to make the reader understand. The information writers provide is necessary for a complete explanation of the topic sentence. How much explanation an idea requires depends on how much our
reader needs. Here, completeness is relative. It depends on the needs of the reader.

4. Order

Order deals with the sequence of the sentence within a paragraph. In a well constructed paragraph the sentences follow a consistent order. Order in paragraph is like organization in an essay. A paragraph that lacks orderly movement will not be coherent, because the reader will not see how the sentences are related, and therefore cannot go easily from one to another.\footnote{Jarum and Sabarun, \textit{Laporan Penelitian Dosen Muda Improving Students’ Writing Ability Through Cooperative Learning Strategy at the English Department of University Malang}: Malang: Universitas Malang, 2007, p. 20.}

F. ESL Writing

It has already been established that learning to write in English as second or a foreign language can be quite different from writing as a native speaker and in many occasions even problematic. In fact, the literature of ESL writing draws attention to various and significant differences between first language and second language teaching contexts, which can generally be attributed to the distinctive social and pedagogical features of each, in addition to differences in linguistic competence and literacy skills of the students.

Teacher written response continues to play a central role in most second language writing classes. Many teachers do not feel that they have done justice to students’ efforts until they have written substantial comments on their papers, justifying the grade they have given and providing a reader
reaction. Similarly, many students see their teacher’s feedback as crucial to their improvement as writers.  

As for ESL writing teachers’ position, also shows that teachers are very much concerned with students’ surface-level errors themselves. This focus on linguistic accuracy probably originated from second language students’ linguistic incompetence, but other pedagogical and social influences may still play a significant role. It can be concluded that previous research findings clearly demonstrate that ESL students want, appreciate, and apply the corrections they get from their teachers. In short, ESL teachers feel obliged to correct writing errors, and students want them to do so.  

G. Writing Ability

Writing ability refers to the students’ competence in applying the components of writing were content, organization, vocabulary, language use (grammar) and mechanic. The writing ability are complex and difficult to teach, requiring mastery not only of grammatical and rhetorical devices but also of conceptual and judgment elements. According to Heaton, the following analysis attempts to group the many and varied skills necessary for writing good prose into four main areas:

1. Grammatical skills: the ability to write correct sentences.
2. Stylistic skills: the ability to manipulate sentences and use language

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51 *Ibid*, p. 11.
effectively.

3. Mechanical skills: the ability to use correctly those conventions particular to the written language, e.g. punctuation, spelling.

4. Judgment skills: the ability to write in an appropriate manner for a particular purpose with a particular audience in mind, together with an ability to organize and order relevant information.

H. Feedback

1. Definition of Feedback

Feedback is input from a reader to a writer with the effect of providing information to the writer for revision. In other words, it is the comments, questions, and suggestions a reader gives a writer to produce ‘reader-based prose’ as opposed to ‘writer based prose. Feedback is helpful not only for students who receive it, the literature also suggests that feedback is important for teachers as well, because it gives them the opportunity to diagnose and assess the problematic issues in learners’ writing, and allows them to create a supportive teaching environment. However, feedback needs to meet certain criteria, such as the need to be specific and to focus on learning and process, rather than on students themselves, in order to be effective.\(^5\)

2. Importance of Feedback

Feedback is a crucial aspect in the writing process and that it plays a central role in learning this skill. Providing learners of writing with

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feedback, however, is not only intended to help them monitor their progress, but also encourages them to take another’s view and adapt a message to it. Another valuable feature of feedback is that it serves as a good indication of how ESL students are progressing in learning the written language and, therefore, assists the teachers in diagnosing and assessing their students’ problematic areas.

Additionally, feedback is helpful in encouraging students not to consider what they write as a final product and in helping them to write multiple drafts and to revise their writing several times in order to produce a much improved piece of writing. This can be adopted and benefited from in a teaching situation where rewriting is encouraged. That is, in a situation where the processes approach to writing is employed.55

I. Peer Correction

Peer correction (peer response, peer feedback/ peer editing) is a technique in which learners review each other’s work and comment on it.56 Peer correction can be defined as the: use of learners as sources of information and interact ants for each other in such a way that learners assume roles and responsibilities normally taken on by a formally trained teacher, tutor, or editor in commenting on and critiquing each other’s drafts in both written and oral formats in the process of writing.

Peer correction takes many forms and serves many purposes. It has already been mentioned that it can be employed in the form of conferencing, in the form of written as well as oral comments, or both simultaneously. This ‘flexibility’ is another useful aspect of peer correction. Peer correction can also take many formats, some of the most common ones being: to assign groups of two, three, or four students and ask them to exchange their first drafts and give comments on each others’ drafts before making final versions; to make students read their own paragraph aloud, or get a colleague to read it instead, while the other students listen and provide correction, either written or oral, on the work that they have just heard; is not to restrict correction to the time after students have written their paragraph, because it is possible for students to use this type of feedback in the pre-writing stage by asking other students to comment on each others’ outlines, or to carry out a brainstorming session.\(^{57}\)

Peer correction helps learners become more self-aware, in the sense that they notice the gap between how they and others perceive their writing, thus facilitating the development of analytical and critical reading and writing skills, enhancing self-reflection and self-expression, promoting a sense of co-ownership, and hence encouraging students to contribute to decision-making, and finally, it fosters reflective thinking.

The literature also suggests that peer correction is more authentic and honest than a teacher’s response, and it gives students the opportunity to realize that other students experience similar difficulties to their own, and it can also lead to less writing apprehension and more confidence. Peer correction can also help develop learners’ editing skills, and establish a social context for writing. More importantly, peer correction internalizes the notion of ‘audience’ into the minds of student writers, because it provides students with a more realistic and tangible audience than their teacher, which in turn assists them in producing ‘reader-oriented’ texts.\(^{58}\) There are a few ways to gauge its effectiveness. First is to collect rough drafts with final drafts and do a quick comparison of them. The teacher can also ask students to write a brief response to peer review, explaining how they think it went, which advice they took, and what was most useful and why. If the teachers ask students to give information, they will likely want to know what teachers think of their decisions. Finally, to use peer review multiple times during course, it will be useful to give students feedback on the quality of their feedback to help them improve their commenting skills.

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\(^{58}\) *Ibid*, p. 36-37.
There are two reasons for peer correction. The first is to get a reader’s opinion about the student writing. A reader can tell that the writer should add more details or explanation, something is not organized clearly, some information that is not relevant or there is something that is hard to understand, these comments will help the writer to write the next draft. The second reason to share writing with others is for the writer to read more examples of writing. Other writer will have had experiences that can show fresh ways of writing experiences. Reading their paragraphs can give good ideas in the future. There are some ways to do peer correction.

1. Read the other partner’s work several times. The first time, read from beginning to the end.

2. On the second reading, go more slowly and look at specific parts of the writing and makes some notes.
   a. Look for topic sentences and concluding sentences.
   b. Note places where something that are hard to understand, where there seems to be unnecessary information, or where there is not enough information.
   c. Let the writer know which parts of the text are especially strong or interesting.
   d. Ask questions. This is a good way to let the writer know where he or she could add more information.
   e. Circle or underline words, phrases, and sentences that are to comment on.
3. Don’t look for grammar or spelling mistakes. Pay attention only to the content and organization of the work.\textsuperscript{59}

J. Teacher Written Feedback

1. Definition of Teacher Written Feedback

Teacher written feedback refers to written responses provided by the teacher to the students’ writing. The responses are limited to comments on grammatical errors and content of the students’ writing. This type of feedback is probably the most traditional and commonly-used techniques of responding to students’ writing in every teaching context where writing teachers are usually the sole providers of comments to their students. Research about teacher-written feedback falls into two main categories; the first looks into teachers’ actual performance and self-assessment, while the other looks at the topic from the students’ perspective. As far as the first category is concerned, teachers’ feedback can take the form of praise (positive comments), criticism (negative comments), or suggestions (constructive criticism). Teachers can determine the content of the feedback by considering the elements of the writing that are strong or that need more work. It is important to identify positive features of the writing. Students do not always find positive comments helpful to improve their writing, they appreciate receiving praise to nurture their confidence as writers and their motivation to write. It makes the students most helpful in guiding their revisions. They

\textsuperscript{59} Dorothy E Zemach and Lisa A Rumisek, \textit{Academic Writing from Paragraph to Essay}, Spain: Macmillan Publisher, 2005, p. 22
appreciate teachers getting involved with the subject of their writing, but do not like to have their ideas questioned or criticized.

2. Teachers’ Techniques for Providing Feedback

Teachers, in responding to their students, utilize different techniques ranging from correcting all errors to merely indicating the location of errors. There are some different techniques to improve students’ writing. What follows is a discussion of these techniques and their roles in helping students learn the skill of writing.\(^{60}\)

a. Direct feedback

In the literature of error correction, the similar kind of direct feedback can be referred to direct correction. Direct feedback refers to teacher providing ‘correct linguistic form’ for students (e.g. word, morpheme, phrase, rewritten sentence, deleted word [s] or morpheme [s]). Example of direct feedback:

**Talkative**

I don’t like Supha because she is speak non-stop.

b. Coded feedback

Coded feedback is a type of indirect feedback and can be referred to error identification in which occurs when the teacher explicitly indicates that errors have been committed and provides a brief explanation without any correction and leaves it to the student to correct by themselves. Example of coded feedback:

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I drive very fast to the university yesterday.

c. Uncoded feedback

As opposed to coded feedback, it can be referred to error location. The teacher simply locates an error by circling it, underlining it, highlighting it or putting a checkmark in the margin. This feedback is more complicated in that students’ correct their errors by identifying them and use their acquired knowledge to self correct such errors. Example of uncoded feedback:

There are many dog in this house.\(^\text{61}\)

3. Types of Teacher Feedback

There are types of teacher feedback:\(^\text{62}\)

<table>
<thead>
<tr>
<th>Comment types:</th>
<th>Examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Praise</td>
<td>Positive comments, non-controlling</td>
</tr>
<tr>
<td></td>
<td>* Well written! Much improved.</td>
</tr>
<tr>
<td></td>
<td>* Quite nicely structured.</td>
</tr>
<tr>
<td>2. Criticism</td>
<td>Negative comments or evaluations, authoritative</td>
</tr>
<tr>
<td></td>
<td>*Contradictory sentences. Confusing</td>
</tr>
<tr>
<td></td>
<td>* Careless with the transition of ideas!</td>
</tr>
</tbody>
</table>


| 3. Imperative | Comments that tell the student writer to do or change something, usually starting with a verb in the imperative form | * Be specific.  
* Do not change the tone and style suddenly. Be consistent. |
| 4. Advice | Suggestive comments often in conditional mode | * Maybe you could add some details here.  
* Perhaps you could expand the topic sentence. |
| 5. Closed question | Questions that either get a ‘yes’ or ‘no’ as answer, or else a simple one-word answer | * Do you think you’ve given an adequate evaluation?  
* Is this word used literally or figuratively? |
| 6. Open question | Questions that require more than a ‘yes’ or ‘no’ answer, often starting with ‘what’, ‘where’, ‘why’, ‘who’, ‘when’ and ‘how’ | * Who gives / gets the lessons?  
* What does this mean? |
| 7. Mechanics | Comments that deal with grammar, punctuation, spelling, word choice etc. | * appreciate  
I am appreciated the help of the people at the counter.  
verb  
Although parents permission him to… |
| 8. ‘?’ - | No comments except a ‘?’ , usually meaning ‘don’t understand’ | * ??  
Many argument government get attract more people from oversea. |

### K. An Experiment Study

An experiment is a scientific investigation in which the researcher manipulates one or more independent variables, controls any other relevant variables, and observes the effect of the manipulations on the dependent
variable(s). An experimenter deliberately and systematically introduces change and then observes the consequences of that change. Only research problems that permit a researcher to manipulate conditions are appropriate for experimental research. The goal of experimental research is to determine whether a causal relationship exists between two or more variables. Because the experiment involves control and careful observation and measurement, this research method provides the most convincing evidence of the effect that one variable has on another.63 The essential requirements for experimental research are control, manipulation of the independent variable, and observation and measurement.64

1. **Control**

   Control of variables is the essence of the experimental method. When a study is completed, researchers want to attribute the outcome to the experimental treatment. To do this, they must eliminate all other possible explanations by controlling the influence of irrelevant variables. Without control it is impossible to evaluate unambiguously the effects of an independent variable or to make inferences about causality.65

2. **Manipulation**

   The manipulation of an independent variable is a deliberate operation performed by the experimenter. In educational research and

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64 Ibid, p. 267.

other behavioral sciences, the manipulation of an independent variable involves setting up different treatment conditions. Treatment is another word for the experimental manipulation of the independent variable. The different treatment conditions administered to the subjects in the experiment are the levels of the independent variable.66

3. Observation and Measurement

After applying the experimental treatment, the researcher observes to determine if the hypothesized change has occurred. Some changes can be observed directly, whereas other changes are measured indirectly. Learning, for example, is often the dependent variable in educational research. Researchers cannot measure learning directly. They can only estimate learning through scores on an achievement test or other measures chosen according to the operational definition. Therefore, strictly speaking, the dependent variable is observed scores rather than learning per se.67

L. Analysis of Variance (ANOVA)

Analysis of Variance (ANOVA) is a statistical method used to test differences between two or more means. It may seem odd that the technique is called "Analysis of Variance" rather than "Analysis of Means."68 ANOVA is a statistical procedure used to analyze the data from a study with more than

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two groups. In analysis of variance, as in the \( t \) test, a ratio comparing observed differences to the error term is used to test hypotheses about the differences among groups. This ratio, called \( F \) ratio, employs the variance \( (\sigma^2) \) of group means as a measure of observed differences among groups. The \( F \) ratio is named for R. A. Fisher, the early statistician who developed it. Because ANOVA can be used with more than two groups, it is a more versatile technique than the \( t \) test. A \( t \) test can be used only to test a difference between two means. ANOVA can test the difference between two or more means.

The general rationale of ANOVA is that the total variance of all subjects in an experiment can be subdivided into two sources: variance between groups and variance within groups. Variance between groups is incorporated into the numerator in the \( F \) ratio. Variance within groups is incorporated into the error term or denominator, as it is in the \( t \) test. As variance between groups increases, the \( F \) ratio increases. As variance within groups increases, the \( F \) ratio decreases. The number of subjects influences the \( F \) ratio: The larger the number, the larger the numerator becomes. When the numerator and denominator are equal, the differences between group means are no greater than would be expected by chance alone. If the numerator is greater than the denominator, you consult the table of \( F \) values to determine

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whether the ratio is great enough to reject the null hypothesis at the predetermined level.\footnote{Donald Ary, Lucy Cheser Jacobs, Chris Sorensen and Asghar Razavieh, Introduction to Research in Education (Eight Edition), United States: Wadsworth Cengage Learning, 2010, p. 179.}

In the present study, the researcher wanted to measure the effect of peer correction and teacher written feedback on the students’ paragraph. To measure this problem, the researcher varied both peer correction and teacher written feedback. The layout for an experiment measuring the combined effects of two or more independent variables is called a counterbalanced design, and the results are analyzed by means of a multifactor analysis of variance. In this study, there were two independent variables were measured, so the researcher used the analysis a two-way repeated measures analysis of variance. A two-way repeated measures ANOVA (also known as a two-factor repeated measures ANOVA, two-factor or two-way ANOVA with repeated measures, or within-within-subjects ANOVA). A two-way repeated measures ANOVA is often used in studies where you have measured a dependent variable over two or more time points, or when subjects have undergone two or more conditions (i.e., the two factors are "peer correction" and "teacher written feedback"). The primary purpose of two-way repeated measures ANOVA is to understand if there is an interaction between these two factors on the dependent variable.