

Deductive or Inductive Technique: An Experimental Study On The Academic Writing of The Sixth Semester Students of Semarang State University

Diajeng Putri Maharani
Universitas Negeri Semarang, Indonesia
diajengputri309@yahoo.com

Dwi Rukmini
Universitas Negeri Semarang, Indonesia
wiwidwirukmini@mail.unnes.ac.id

Abdurrachman Faridi
Universitas Negeri Semarang, Indonesia
pakdur@mail.unnes.ac.id

Puji Astuti
Universitas Negeri Semarang, Indonesia
puji.astuti.ssu@mail.unnes.ac.id

Abstract. Most scholars tend to say that teaching is an art meaning that there is artistry in the way lecturers associate with students in order to foster their understanding. However, teaching is also considered to be science since based on certain research, there are some strategies or techniques to be effective in enhancing learning. In this paper, the writer investigated the superiority of the teaching technique whether it is deductive technique or inductive technique for the teaching of academic writing. Two classes of the sixth semester students of the English department of State University of Semarang (Unnes) were taken as samples each of which consisting of 30 students was given different treatment, inductive and deductive technique. The result shows that the t-value of inductive is 1.390 and the t-table is 0.683 and the t-value of deductive is 8.092 and the t-table is 0.683. From the result of the t-test, it shows that the t-value of deductive is higher than the t-value of inductive and compared to the t-table, the t-value of deductive is more significant than it is in inductive strategy. Thus, it can be concluded that deductive technique is more effective than inductive technique applied in the teaching of academic writing. Therefore, it is recommended that in teaching academic writing lecturers may elaborate more in using deductive technique than in using inductive technique. The lecturers may start from giving the concept or rules and explain them in detail then gives the students examples and then ask them to practice by following the rules.

Keywords: deductive, inductive, academic writing.

I. INTRODUCTION

One of the main duties of lecturers in teaching learning is to develop the students' mastery and deep understanding on the material taught. However, since there are different types of students where some are critical while others are non-critical, some are auditory and some are visual, then different types of teaching techniques are sometimes required. It is assumed that certain teaching techniques may influence the students' understanding on the

teaching material taught or even may influence the students' motivation to learn. It is then a must for lecturers to find the most suitable technique for all types of students in their teaching learning process in the classroom. In this paper the writer tried to reveal whether or not deductive technique would be superior to inductive technique for the teaching of academic writing or vice versa regardless of what they belong to the types of students. What is meant by deductive technique of teaching the teaching that starts from giving rules or concepts then examples and practice. On the other hand, inductive teaching technique is the teaching that starts from giving examples and then asks the students to find and explore the rules. These different teaching techniques may bring about different outcomes for students learning academic writing. Therefore, the writer tried to prove it through carrying out an experimental study with pretest- posttest design where one group was taught using deductive technique and the other group was taught using inductive technique. The research questions put forward in this research were: 1) to what extent is the students' academic writing after being taught using deductive technique? 2) To what extent is the students' academic writing skill after being taught using inductive technique? 3) Is there any significant difference between those taught by using deductive and inductive techniques on the students' academic writing?

Literary Review

It is compulsory for a higher education student to master academic writing for the fact that in order to finish the study he or she has to be able to write a research proposal or a research report. Besides, through writing, learners are able to develop their ability to think explicitly about how to organize and express their thoughts, feelings and ideas in ways compatible with envisioned readers' expectations

(Kern (2000, p, 172; Oshima&Hoque 2006; Bair and Mader, Cyntia:2013; Astrid et.all: 2017). Thus, it is clear that writing has multi purposes not only to write a research project report but to some extent it is badly needed for his future career as well as to develop ideas and share them for communication especially with the readers and as a matter of that language is realized in the form of a text (Thornbury: 2012: 6).

In line with Kern, Nunan (2003: 88) states that writing is a mental activity of creating ideas, thinking how to express them and manage them into statements and paragraph that will be explicit to a reader. The definition mentioned above implies the meaning that writing is the result of collection of thoughts that can generate ideas expressed in statements or paragraph. With reference to that idea, developing ideas into sentences or paragraph is the most important competence to be practiced by the students though it seems to be the most difficult task to do. Seow (2002) in Richard and Renandya (2010:303) supports the idea that the students' difficulty in writing lies not only in generating and organizing ideas but also in translating these ideas into readable text. A text is readable when it is cohesive and coherent. Cohesive is meant that the sentences or the parts of a text hang together and make sense (coherent). It is possible that a cohesive text can be non-sense when the ideas developed in the text are not interrelated. The aim of using cohesive devices is basically to relate ideas to make the text easier to follow and if the interaction between the reader and the text is achieved, it is cohesive and coherent (Thornbury 2005: 36).

Seow (2010) in Richard and Renandya (2010: 309) further states that there are complex elements of writing such as content, organizing, originality, style, fluency, accuracy or rhetorical forms of discourse and that is why it is suggested that a writer should prioritize the most important ones to be taken into consideration in writing. With reference to the major function of language, Derewianka (2011: 4) states that it is a representation of experience that helps us express and understand what goes on in our lives and therefore developing ideas should be prioritized. When the main idea is stated in a sentence, the statement is called topic sentence or thesis statement (Smith 1989: 127). Topic sentences can be placed at the beginning, at the end of the paragraph, in the middle of paragraph and in both introductory and concluding sentences. In general, when the main idea is put at the beginning of a paragraph, it is followed by some details. The details are specific examples or statements that support the main idea and to guide the readers to a full understanding of the main idea. It is not easy, however to develop ideas because it needs a lot of experience got from reading books, articles or whatever where that experience will influence the ideas the writer wants

to generate. Under graduate students even still find difficulties in connecting ideas as can be seen from their text in which they very often use very simple sentences with no cohesive devices provided. The text produced is like children's. As a matter of fact, in academic writing, students are required to write long sentences in order to connect related ideas in one paragraph.

With reference to Brown 2007, Derewianka 2011, Thornbury (2005: 153) citing from the Cambridge Advanced English Examination states that students' writing paper is assessed based on the criteria of content, organization and cohesion, range, register, target reader and accuracy of language. The content refers to the extent of which the text covers the points according to the specification of the task; organization and cohesion refer to the appropriateness of the organization, the lay out and the link of the text; range means whether or not there is sufficient wide range of vocabulary and grammatical structures; register means the appropriate of style to the topic, text type, purpose and target reader. Target reader is meant to see whether or not the writer has kept the reader in mind and accuracy of the language is meant to see whether or not the text is accurate in its use of vocabulary, grammar, discourse features. From this statement it can be stated that writing is such a difficult skill to be mastered for there are complex elements to be taken into consideration.

Realizing how difficult to teach writing is, lecturers have been trying to employ teaching techniques which are suitable for the students. The current teaching techniques that have been elaborated by the lecturers are inductive and deductive techniques. What is meant by inductive teaching technique is the teaching which starts from specific to general or from giving examples to identifying rules (Trochim (2006: 1) and deductive technique begins with the general points and ends with the specific or from identifying rules to practices. Fudge (2015) further argues that if you want your audience to discover new things with you, then inductive writing might make sense. He mentions a short paragraph as follows:

My dog Max wants to chase every non-human living creature he sees, whether it is the cats in the house or rabbits and squirrels in the backyard. Sources indicate that this is a behavior typical of Jack Russell terriers. While Max is a mixed breed dog, he is approximately the same size and has many of the typical markings of a Jack Russell. From these facts along with his behaviors, we surmise that Max is indeed at least part Jack Russell terrier.

From this short paragraph, we will learn Max’s manners and a little about what he might look like, and then the concluding sentence connected these ideas together. This kind of writing often keeps the reader’s attention, as he or she must read all the pieces of the puzzle before they are connected.

However, Creswell and Clark (2007) argue that the deductive researcher “works from the ‘top down’, from a theory to hypotheses to data to add to or contradict the theory.” If this logical thinking is applied in language teaching, the teacher starts from introducing and explaining the concepts or rules, let say the grammar rules, and then from the rules he/she can give some examples that follow the rules. This technique is more teacher centered than inductive technique because in this technique the teacher is more active than the students are in the teaching learning process. So, it is of great importance to find out whether deductive technique would be more effective to teach academic writing than inductive technique.

II. METHOD

This study was conducted in the English Department of Semarang state university with the samples of two classes each of which consists of 30 students. It employed quasi experiment with pre-test and post-test design. One group was taught using inductive technique and the other group was taught using deductive technique. Before treatment, both groups were given pre-test and after the treatment they were given post-test. The pre-test and post-test of each group were compared to find out whether there is an increase after being treated with different techniques. The post-test scores of both groups were analysed using SPSS version 20 in order to find out the significant difference on inductive and deductive techniques used for the teaching of academic writing.

Findings and Discussion

In this section, the result of data analysis is given including the descriptive statistic of pre-test and post-test in inductive technique, pre-test and post-test in deductive and the post-test of inductive and the post-test of deductive.

Table 4.14 the descriptive statistics of pre-test and post-test in inductive strategy

DESCRIPTIVES VARIABLES=PreTest PostTest /STATISTICS=MEAN STDDEV RANGE MIN MAX.

Descriptives
[DataSet0]

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
PreTest	30	28.25	55.00	83.25	70.5833	7.58126
PostTest	30	24.50	56.00	80.50	70.1500	5.34282
Valid N (listwise)	30					

Based on the result of the descriptive statistics analysis for the pre test scores and post-test scores obtained by the students who received inductive strategy in teaching writing above, shows that the mean score of pre-test 70.5833 is higher than the mean score of post-test 70.1500. It means that there is no increase in the students’ academic writing after being taught using inductive technique

Table 4.16 The descriptive statistics in the pre-test and post-test of deductive strategy

DESCRIPTIVES VARIABLES=PreTest PostTest /STATISTICS=MEAN STDDEV RANGE MIN M AX.

Descriptives
[DataSet0]

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
PreTest	30	24.00	56.00	80.00	67.4333	6.29961
PostTest	30	10.25	69.00	79.25	73.6333	3.52255
Valid N (listwise)	30					

The descriptive statistics of pre-test and post-test in deductive technique shown in table 4.16 indicates that the mean score of post-test 73.6333 is higher

than the mean score of pre-test 67.433. It implies the meaning that there is an increase in the students' academic writing after being taught using deductive technique.

Table 4. The result of the t-test of inductive and deductive technique

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error
INDUCTIVE	30	78.3837	3.53674	.64572
DEDUCTIVE	30	77.7057	3.32269	.60664

One-Sample Test

	T-table = 0.683					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
INDUCTIVE	1.390	29	.000	78.38367	77.0630	79.7043
DEDUCTIVE	8.092	29	.000	77.70567	76.4650	78.9464

From the table above, it shows that the t-value of inductive is 1.390 while the t-value of deductive is 8.092 both are higher than the t-table 0.683. However, the t-value of deductive 8.092 is higher than the t-value of inductive 1.390. Thus, it can be concluded that deductive technique is more effective for the teaching of academic writing than the inductive technique.

III. DISCUSSION

If we take a look at the lesson plan, particularly the material taught, after getting the subject of academic writing, the students are expected to be able to explain the differences between academic and non-academic essays, clause elements, to be able to create lexical density in academic writing, to be able to formulate topic sentence, enhance topic sentence to form a cohesive paragraph etc, and the techniques employed for the teaching of the material are among others group discussion, interactive lecture, exercises, presentation. Seeing from the process of teaching learning mentioned in the lesson plan, it can be inferred that the lecturer tends to employ inductive technique of teaching for he tries to give examples to the students' academic and non-

academic texts and tell them that they are different and after that he asks the students to explore and identify the rules in order to be able differ an academic writing and a non-academic writing. Through group discussion the students are given more chance to elaborate, to explore the way how to get deep understanding on the material taught and the lecturer functions as a facilitator, a motivator, and a counselor and only when they have problems they come to the lecturer for consultation. This technique forces the students to do things including elaborating, exploring the knowledge independently and finally they can enhance their deep understanding on the material taught. However, based on the result of the study there is no increase in students' academic writing after being taught using inductive. This can happen due to the fact that students need more guidance on how to write academic writing. Though they are given more time to explore and identify the rules, they might still be blind how to do it. Different from when they are given rules first, then explain them in detail and afterward they are given examples might lead them to do it easier. The fact that writing scientific paper is not easy as it is also admitted by many scholars for the difficulty of writing do for it involves complex elements of writing such as content, organizing, originality, style, fluency, accuracy or rhetorical forms of discourse, Seow (2002) in Richard and Renandya (2010:303). In this case, therefore, students need detail explanation and then given ample of good examples so that they can imitate them with the correct pattern or rules already explained by the lecturer. Things that should be kept in mind in writing an academic paragraph is to determine the main idea in a topic sentence and that main idea needs some supporting details and cohesive ties so as to make the whole paragraph coherent and cohesive. A proverb which says "experience makes perfect" is quite suitable for the teaching of academic writing where students are exposed to experiencing the way how to write as often as possible as it is also stated by Derewianka (2011: 4) experience may help students express and understand what goes on in our lives and therefore developing ideas. From the explanation above it can be stated that deductive technique of teaching is reasonable more effective for the teaching of academic writing than the inductive technique.

IV. CONCLUSION

With reference to the data analysis as mentioned above where the t-value of the deductive technique is 8.092 and the t-value of inductive is 1.390 and the t-table is 0.683, it can be concluded that deductive technique of teaching is more effective for the teaching of academic writing than the inductive technique.

Thus, it brings an implication that the lecturer of academic writing should make use of deductive strategy most of the time during the teaching learning process in order that students will have good mastery in academic writing. The lecturer may start from explaining the concepts or rules in detail and then give ample of examples and then ask the students to practice by themselves by referring to rules already explained. By using this technique, students feel more confident to practice in writing academic for they have learnt the rules to follow. Practicing makes perfect, the more the students practice the better the result will be.

REFERENCES

- [1] Alzu'bi Mohammad Akram (2015) Effectiveness of Inductive and Deductive Methods in Teaching Grammar Advances in Language and Literary Studies ISSN: 2203-4714 Vol. 6 No. 2; April 2015 Australian International Academic Centre, Australia
- [2] Angeli, C., & Valanides, N. (2009). Instructional effects on critical thinking: Performance on ill-defined issues *Learning and Instruction*, 19 (4), 322-334 DOI: [10.1016/j.learninstruc.2008.06.010](https://doi.org/10.1016/j.learninstruc.2008.06.010)
- [3] Arifin Syaadhah (2016) Deductive and Inductive Methods in Teaching Tenses Journal of ELT Research, Volume 1, Number 1, January 2016-June 2016
- [4] Astrid,A., Rukmini,D., Sofwan, A., Fitriati S.W (2017) The Analysis of Engagement to Writing Feedback Activities Viewed from Students' Writing Anxiety International Journal of English and Education ISSN: 2278-4012, Volume:6, Issue:1, January 2017
- [5] Bair, Mary A. and Mader, Cynthia E. (2013) Academic Writing at the Graduate Level: Improving the Curriculum through Faculty Collaboration *Journal of University Teaching & Learning Practice* Volume 10 | Issue 1 Article 43-14-2013
- [6] Brown,Douglas, H. 2004. *Language Assessment: Principles and Classroom Practices*. San Francisco: Pearson Education, Inc.
- [7] Creswell, J.W., & Plano Clark, V.L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage Publications.
- [8] Donnelly, R., and Fitzmaurice, M. (2011) Crucial Connections: an Exploration of Critical Thinking and Scholarly Writing. In C.Horvath & J. Forte (eds) *Critical Thinking* (pp.159-174) New York, Nova Science Publishers.
- [9] Fudge Tamara (2005), Inductive vs Deductive. Academic Support Centre Blog
- Kaplan University [February 25, 2015](https://www.kaplan.edu/news/2015/02/25/kuwcnews) by [kuwcnews](http://kuwcnews.kaplan.edu)
- [10] Gall, Meredith D.; Gall, JoyceP.; dan Borg, Walter R. 2003. *Educational Research*. Boston: Pearson Education, Inc.
- [11] Helmantel Marjon Tammenga, Bazhutkina Iryna, Steringa Sharon,
- Hummel Ingrid, Suhre Cor. (2016) Comparing inductive and deductive grammatical instruction in teaching German as a foreign language in Dutch classrooms *System* 63 (2016) 101e114 Contents lists available at [ScienceDirect](http://www.sciencedirect.com) journal homepage: www.elsevier.com/locate/system
- [12] Hmedan Heba Ali Amer and Nafi' Jamal Subhi Ismail (2016) The Effect of Using Inductive and Deductive Methods on 7th Grade Students' Achievement in Grammar in Bethlehem District and their Attitudes toward EFL International Journal of Education and Social Science www.ijessnet.com Vol. 3 No. 9; September 2016.
- [13] Keraf, Gorys. 2004. *Diksi dan Gaya Bahasa*. Flores: Nusa Indah.
- [14] Kern, Richard. 2000. *Literacy and Language Teaching*. Oxford: Oxford University Press
- [15] Klimova Blanka Frydrychova (2011) Developing Thinking Skills in the Course of Academic Writing *Procedia-Social and Behavioral Sciences ELSEVIER* Vol 93,21 October2011, Pages 508-51
- [16] McMahan, Elizabeth and Day, Susan. 1984. *The Writer's Rhetoric and Handbook*. New York: McGraw-Hill
- [17] Murcia, Celce, Marianne and Olshtain, Elite. 2007. *Discourse and Context in Language Teaching: A Guide for Language Teachers*.Cambridge: Cambridge University Press
- [18] Ntereke Beauty B. (2008) Effectiveness of Academic Writing Activities and Instruction in an Academic Literacy Writing Course at the University of Botswana *Journal of Pedagogic Development* Volume 5, Issue 3 2008
- [19] Oshima,A. & Hogue, A. 2006. *Writing Academic English*. California: Addison Wesley Publishing Company
- [20] Pineteh Ernest A (2014) The Academic Writing Challenges of Undergraduate Students: A South African Case Study *International Journal of Higher Education* Vol. 3, No. 1; 2014 Published by Sciedu Press 12 ISSN 1927-6044 E-ISSN 1927-6052
- [21] Quitadamo, Ian J. and Kurtz, Martha J. (2007) W. Bradley Kincaid, Monitoring Editor Learning to Improve: Using Writing to

- Increase Critical Thinking Performance in General Education Biology CBE Life Sciences Education 2007 Summer 6(2) 130-154 USA
- [22] Richards, Jack C and Renandya, Willy A. *Methodology in Language Teaching: An Anthology of Current Practice*. New York: Cambridge University Press
- [23] Seow, Anthony. 2010. The Writing Process and Process Writing. In *Methodology in Language Teaching: An Anthology of Current Practice*.
- [24] Scheffer B. K. and Rubinfeld M.G., (2000). "A Consensus Statement on Critical Thinking in Nursing," *Journal of Nursing Education*, 39, 352-9 (2000).
- [25] Shaarawy H., Y., (2014). The Effect of Journal Writing on Students' Cognitive Critical Thinking Skills: a Quasi-Experimental Research on English as a Foreign Language (EFL) Undergraduate Classroom in Egypt. www.sciedu.ca/ijhe
- International Journal of Higher Education Vol. 3, No. 4; 2014 Published by Sciedu Press 120 ISSN 1927-6044 E-ISSN 1927-6052
- [26] Smith D, Brenda. 1989. *Bridging the Gap: College Reading*. Illinois: Scott, Foresman and Company.
- [27] Thornbury, Scott. 2005. *Beyond the Sentence: Introducing Discourse Analysis*. Oxford: Macmillan Publishers Limited
- [28] Trochim, W.M.K. (2006). *Research methods knowledge base*. Retrieved on January 25, 2010 from <http://www.socialresearchmethods.net>
- [29] Walvoord, Barbara. 2004. *Assessment Clear and Simple: A Practical Guide for Institution, Departments and General Education*. New York: John Wiley and Sons Ltd.