

# EFFECTS OF COGNITIVE COMPLEXITY ON UNDERGRADUATE EFL LEARNERS' ENGLISH WRITING PERFORMANCE

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## ABSTRACT

This study aimed to investigate the effects of cognitive complexity along +/- reasoning demands dimension on EFL students' English writing performance in terms of accuracy and complexity. The study was motivated by Robinson's Cognition Hypothesis (CH) as well as previous studies investigating the relationships between task complexity and second language production. The participants of the study were 32 Undergraduate students in an English language education program at University of Muhammadiyah Jember, chosen from the 6<sup>th</sup> and 8<sup>th</sup> semesters. Each student received all the levels of cognitive complexity (+/- reasoning demands) of the tasks. The -reasoning demand was operationalized through description task and +reasoning demand was operationalized through interpretation task. It is basically students were asked to describe and interpret the same picture. The results showed that there is a significant effect of cognitive complexity on students' English writing performance. Moreover, cognitive complexity in terms of +reasoning demand pushed students to greater complexity.

**Key Words: Cognitive Complexity, Writing, Accuracy, Complexity.**

Research on second or foreign language (L2) writing skills has indicated that various factors affect students' L2 writing performance (Rahimpour, 2008). Nonetheless, relatively little is known as to how levels of *cognitive complexity* as

reflected in L2 writing tasks affect students' L2 writing performance (Ishikawa, 2006; Kuiken & Vedder, 2007, 2008).

Within the context of L2 writing instruction, levels of

'cognitive complexity' may be defined as *the extent* of which L2 writing tasks require (or do not require) learners to deploy higher order thinking skills as they produce written texts. For instance, L2 writing tasks that only require learners to *describe* referents depicted in a picture may be assumed to require less higher-order thinking skills. This is because such tasks only require the learners to write whatever they see in the picture. In contrast, L2 writing tasks that require learners to *interpret* particular scenes depicted in a picture may be assumed to require higher-order thinking skills since these tasks require that the learners *not only* to describe whatever they see in the given picture, but also to be able to generate ideas or opinions related to the scenes depicted in the picture (see Chapter 2 for details).

From theoretical perspectives, these two types of L2 writing tasks, which differ in terms of their cognitive complexity, can affect learners' L2 writing performance in many ways. Specifically, Robinson (2001, 2003, 2005, 2007) argues that getting learners to perform complex L2 writing tasks may increase both accuracy and complexity of their writing performance. However, such complex L2 writing tasks can reduce the learners' ability to write fluently. That is, the learners might need longer preparation time to cope with complex L2 writing tasks. On the other hand, getting learners to

perform less complex L2 writing tasks may be conducive to increasing the accuracy and fluency. However, less complex tasks are less conducive to increasing the complexity of L2 writing performance.

Based on this complex/less complex distinction, Robinson (2001) maintains that L2 writing tasks need to be sequenced in an appropriate manner order so as to promote *balanced development* of accuracy, complexity and fluency. From pedagogic standpoint, such balanced development constitutes the ultimate goal of L2 instruction (Ellis, 2005; Lambert & Kormos, 2014; Skehan, 2009).

## Method

The present study employed experimental research methods to examine whether cognitive complexity affects undergraduate EFL learners' English writing performance. In line with the research methods, the present study thus employed a one-way repeated-measured factorial design. Each participant received all the levels or types of the treatment (Ary. et.al, 2010).

The first factor is cognitive complexity at two levels: (1) lower level of cognitive complexity as reflected in the -reasoning demands, and (2) higher level of cognitive complexity as reflected in the +reasoning demands. Meanwhile, the second factor includes undergraduate

EFL learners' English writing performance at two levels: (i) accurate writing performance, and (ii) complex writing performance.

Participants of this study were 32 undergraduate students, specifically the 6<sup>th</sup> and 8<sup>th</sup> semesters students who enrolled in an English language education program at University of Muhammadiyah Jember. To collect data, the researcher met with each research participant. These participants were asked to write two different types of texts: descriptive and interpretive. Approximately 50% of these participants were asked to write a descriptive text before an interpretive text, whereas the other 50% of these participants wrote an interpretive text before a descriptive text. In this way, the distribution of the tasks to the participants was counterbalanced. Such counterbalancing was necessary to minimize carry-over effects (Ary. et.al, 2010).

After collecting and coding the data for this study, it then was analyzed using a one-way multivariate analysis of variance (MANOVA) and correlation test.

## **Results and Discussion**

The outcomes of the study suggested that increases cognitive complexity along with reasoning demand affected EFL students' writing accuracy and complexity. According to Robinson (2003) manipulating cognitive complexity

of a task along resource-directing dimensions (e.g., the amount of reasoning) may direct attentional and memory resources to task completion and therefore generate more accurate and complex language. Therefore, the findings of this study confirm the Robinson's cognition hypothesis within the written modality. In that, it provides further support for the positive impact of cognitive complexity manipulation on EFL learners' accuracy and complexity.

Considering the results of the statistical analysis for the effect of cognitive complexity on the complexity of English learners' written production, complex task led to the production of more complex language. It means, students produced language that is more complex on the interpretation task than on the description task. The finding of this aspect of this study is in line with the predictions of Cognition Hypothesis which states that increasing the cognitive complexity of a task along resource-directing will lead to more complex production of language (Robinson, 2001). Moreover, Ellis & Barkhuizen (2005) in that task with more cognitive demands push L2 learners to perform tasks in certain ways, prioritizing one or another aspect of language. Thus, complex tasks push learners to prioritize complexity.

## **Conclusion**

There was a significant effect of cognitive complexity (+/-

reasoning demand), on undergraduate EFL learners' English writing performance (accuracy and complexity). Increases cognitive complexity affected both accuracy and complexity. Moreover, interpretation task (+reasoning demand) pushed learners to produce more complex language.

The results of this study may have some pedagogical implications. The results of this study are of practical use for language teachers. The use of writing task that is based on the cognitive complexity may be used for language assessment and evaluate learners' language knowledge. Furthermore, the use of cognitively demanding tasks may push learners to use their own linguistic resources that is already in their memory.

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