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# Impact of Cognitive Complexity of Tasks on EFL Learners' Individual and Collaborative Written Performance

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**ABSTRACT**
In the last few decades, tasks as the basic unit in the syllabus designing process and the cognitive complexity of tasks as a fundamental criterion in task sequencing, have attracted the attention of language researchers. At the same time, collaborative task performance has been encouraged due to the researchers' focus on the sociocultural theory proposed by Vygotsky (1978). The present study aimed to investigate the effect of task cognitive complexity on Iranian EFL learners' individual and collaborative written task performance regarding complexity, accuracy, and fluency. To fulfill such a purpose, 70 male and female Iranian intermediate EFL learners were selected as the participants through the Oxford Placement Test, from among the undergraduate students of the Islamic Azad University of Arak, who had passed two general English grammar courses in two succeeding semesters and were participating in Advanced Writing Course at the time of conducting this research. They were asked to perform some writing tasks both individually and collaboratively, while the cognitive complexity of the tasks (i.e. the reasoning demands and prior planning) was evaluated by the researcher. The analysis of their written productions revealed that when writing individually, with no planning time available, intermediate EFL learners created more complex texts in their complex tasks and more fluent texts in their simple tasks, and when writing collaboratively, with some planning time available, they produced more fluent texts in their complex tasks. The findings of the current study have pedagogical implications for teachers, syllabus designers, as well as curriculum developers to sequence the process of teaching so that learners can tackle the cognitive complexity load the tasks have on them.

**Keywords:** Accuracy; Cognitive Complexity; Collaborative Writing; Complexity; Fluency; Task

## INTRODUCTION

Numerous studies analyzing the nature and quality of collaboratively written texts have investigated the outcome of collaborative writing activities. The results confirm that learners writing in pairs or small groups produce linguistically more accurate texts than those writing individually. But, as Storch (2005) observes, this does not necessarily mean that 'learners have acquired new knowledge. A different line of research has investigated the actual impact of collaboration on L2 learning.

Storch (2005) compares the findings of studies conducted using a variety of methodological approaches— pre-posttest designs, tailor-made tests, and process-product approaches—to conclude that 'collaborative activity does lead to language learning. But the need for further research in this area and, in particular, for more longitudinal research is felt. Hence, the current research is going to compare collaborative writing vs. individual writing by investigating the effect each has on the complexity, accuracy, and fluency of the EFL

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learners' writing tasks while regarding the cognitive complexity of tasks.

Task-based activities and instructions have received a great deal of attention in recent decades, since activities have the potential to enable students to focus on both context and meaning (Skehan, 1998; Ellis, 2003) and, as a result, direct their attention to language. (Long and Robinson, 1998). But the question is: How can tasks be organized in a task-based syllabus? According to Corder (1981), in view of the fact that students, regardless of their formal education, develop their own internal syllabus, that is, the built-in syllabus, alignment between students' instructions and comprehension processes seems important (Kumaravadivelu, 2006), without allocating a psychological basis to the syllabus. Psychological processes activated during language learning and language production were considered by Skehan (1998) using a model of brain-language and language-driven activities. This method of cognitive processing introduces work as a tool that accelerates the processing of information (Ellis, 2000) such as awareness (Schmidt, 2001), editing, storing, and retrieving information, etc. In addition, the complexity of comprehension is presented as an important condition for the planning of teaching activities in this approach (Robinson, 2007), from simple to almost comprehensive (Ellis, 2000; Foster and Skehan, 1996; Rahimpour, 2007; Robinson, 2005; Skehan, Skehan, 198; and Foster, 2001).

In contrast to Skehan, Robinson (2005) argued that the power of attention consists of other resources, also called the model of multiple objects of attention by Wickens (2007); and is based on task requirements. Therefore, students use these different resources separately or equally.

In the Cognition Hypothesis (CH), Robinson (2001) declared that because of these many pools, there would be "attention shifting" (p. 307) from one pool to another, not prioritizing the attention demanded by Skehan and Foster (1999). Based on the Cognition Hypothesis, pedagogical tasks should be organized by gradually increasing cognitive complexity through different types of cognitively affecting variables (Robinson, 2001 as cited in Mukhrib, 2021). According to cognitive load theory, there are three types of variables: extraneous, intrinsic, and germane. The first of these is grounded in the presentation of the task, i.e. the mode of instruction, the second to the effort necessary to complete the task and the third is how much effort is required to create lasting knowledge (Kalyuga, 2011). In the context of task-based learning, therefore, these three elements refer to the type of task (written, oral, group, or individual for example), the complexity of the task, and finally how likely the task and its completion are to lead to improvement in language learning (Haidet et al, 2014).

To implement the Cognition Hypothesis, Robinson developed the Triadic Componential Framework (Robinson, 2001, 2005, 2007, 2011) which provides more complex ways in which it can be applied to tasks. In this framework, a distinction is made between resource management elements and resource dissipation elements. Increasing the complexity of resource management elements is expected to increase the cognitive/conceptual needs of the learner. Robinson also argues that an increase in resources that guide resources may direct students' attention to make recognition easier.

Robinson's Triadic Componential Framework (2011) was accepted as the theoretical basis for the current study. Robinson (2005) suggested that greater workload compliance in terms of resource management standards will direct students' attention to improving the complexity and accuracy of their products so that they can overcome over-task/communication work requirements set by the task structure (Robinson, 2005). Given the complexity and precision, students will not be encouraged to develop fluent language. Increased complexity of cognitive tasks and magnitude of resource dispersal will not attract students' attention to the formal aspect of language (Robinson, 2005); in other words, the conceptual demands of these activities distract their attention from the language codes because they overwhelm students, and, as a result, can lead to less fluency, accuracy, and complexity.

There are specific linguistic measures for each of the above aspects; that is, fluency, accuracy, and complexity. The following table presents some of the most common measures developed by Ellis and Barkhuizen (2005).

**Table 1**

***Selected measures of fluency, accuracy, and complexity***

| Aspect | Measure | Method of Calculation |
|---|---|---|
| Fluency | 1. Syllables per minute | After dysfluencies have been removed, the number of syllables is counted and divided by the total speaking time. |
| | 2. Mean length of pauses | The length of each pause and then the total length of all pauses is calculated. This is divided by the total number of pauses. |
| | 3. Number of repetitions | The total number of times a word, phrase, or complete utterance is repeated is counted. |
| Accuracy | 1. Percentage of error-free clause | The learners' production is divided into clauses and each clause is examined to see if it contains an error or is error-free. The number of error-free clauses is divided by the total number of clauses and expressed as a percentage. |
| | 2. Target-like use of a specific grammatical feature | A specific grammatical feature is selected for analysis (e.g. past tense). Obligatory occasions for the use of this feature are identified and the number of times the learner supplies or fails to supply the target feature is identified. Accuracy is expressed as a percentage of correct suppliance. |
| Complexity | 1. Amount of subordinates used | The learner's production is divided into clauses and the number of (1) total clauses and (2) subordinate classes is calculated. (2) is then divided y $(1)^3$. |
| | 2. Lexical richness (type-token ratio) | The total number of different words used (= types) is divided by the total number of words (=tokens) $\text{used}^4$. |

## LITERATURE REVIEW

Research on tasks includes both the performance of tasks and the relationship between task performance and acquisition. That is, research either examines the development in terms of learners' performance in which development is taking place or the final level of development that entails experimental studies. Below, the first group is introduced.

1. The impact of task design and implementation variables on learners' comprehension in input-based tasks.
2. The impact of task types on the interactive behavior of L2 learners (e.g. in terms of negotiation of meaning and language-related episodes).
3. The impact of manipulating task design and implementation features on L2 output in terms of fluency, accuracy, and complexity.
4. The extent to which focused tasks are successful in eliciting the specific linguistic features that they are targeting.
5. The nature of the various focus-on-form techniques that occur in task performance.

Another important topic is the role played by individual learner factors such as working memory and language classroom anxiety in

mediating how learners perform tasks and the learning takes place.

**Measuring Task-based Language Production**

According to Ellis (2012), a learner's production is measured in two main ways – either in terms of the kind of discourse that is deemed to be theoretically important for learning or in terms of the general qualities of the learner's production. According to Doughty (2001), although a task requires to focus on meaning primarily, the secondary attention to linguistic form couldn't be ignored. It is argued in the interactionist-cognitive theories of the second language that for acquisition to take place learners attend to form while they are trying to understand and produce meaningful messages. Also, sociocultural theories claim that the process of languaging- talking about language (Swain, 2006)- enables the students to scaffold the zone of proximal development (cited in Ellis, 2012). These theories have given rise to three discourse measures- negotiation of meaning, language-related episodes, and focus-on-form episodes. In addition to these discourse measures, conversational analysis is a means by which orderliness, structure, and sequential patterns of the interactions in the performance of different tasks are examined. Also, it has been employed to demonstrate the nature of the "activity" those learners construct out of a "task" and the micro genetic development of some specific linguistic or interactional feature over time (Ellis, 2012). Robinson, (2005) in his Trade-off Hypothesis, argues that when complexity increases, resources for the dissemination of resources do not direct students' attention to the language needed to meet the demands of difficult tasks; instead, attention is dispersed and makes the final work harder.). Robinson states that raising the demands of task (a) will motivate students to produce greater accuracy and complexity of L2 in order to meet the high-performance requirements and communication ideas placed on the tasks by students, (b) will develop interaction, and increase attention and input memory to increase learning input, (c) will help long-term retention of entries; ultimately (d) will lead to the automation and order of the components of the complex L2 operation by creating a simple to the complex sequence.

Robinson (2001) describes the complexity of the tasks as "the result of the attentional memory and other information processing needs imposed by the task structure on the language learner" (p. 29). These differences in information processing requirements based on design features are limited. He differentiates between carefully defined complexity, students' perceptions of the complexity of the task, and the interdependent conditions in which the tasks are completed.

In terms of the size of resource management, Robinson talks about critical thinking needs. He believes that while activities do not require students to think and represent only the transfer of knowledge, they require less intellectual and language effort and fewer resources, compared to activities with specific thinking needs. Regarding the flexibility of resource management, Robinson (2001b, 2003, 2005, 2007) argues that the complexity of the task affects fluency negatively, but accuracy and complexity in a positive way. An example of the diversity of service delivery is having access to pre-planning time so that, not giving up planning time increases the complexity of the task by simply scattering attentional resources over different parts of the task. Ellis (2018) believes that resource management factors such as thinking can be combined with resource distribution features, e.g. pre-planning tasks to reduce the burden of processing and assist automation.

Ellis argues that Robinson's framework provides a useful horizontal sequence of functions but is still problematic because his approach aims to provide a solid foundation for the sequence of tasks in terms of its complexity, but taxonomy-based research has failed to provide basic support. Robinson's claims that more complex tasks lead to more complex and precise L2 production. He goes on to say that the biggest problem with the taxonomic approach to task complexity is that tasks are all-encompassing and have a lot of hallmarks. Therefore, it is very important to find out how the combination of different factors (resource

management and resource distribution) affects the complexity of the task and the production of L2.

**Complexity, Accuracy, Fluency (CAF)**

Most SLA researchers (e.g. Housen, et al., 2012) hold that knowledge of a second language is not a single concept. It has many components in terms of concepts such as complexity, fluency, and accuracy. In recent years, the CAF triangle has been regarded as compliant with other professional models such as the four-skill model and the sociolinguistic models (Bachman, 1990; Bialystok, 1994 Canale, and Swain, 1980). Some researchers have argued that due to significant differences in the processes involved in L2 writing, Robinson's (2011) and Skehan's (2014) models, originally proposed for second-language speaking, may not work directly in the second language. (Kormos and Trebits, 2012; Tavakoli, 2014). Only a few studies have examined these models in L2 writing (e.g. Frear and Bitchener, 2015; Ishikawa, 2007; Kuiken and Vedder, 2007, 2012). In fact, many previous studies of collaborative activities have examined "spoken speech" more than "written speech" (Shehadeh, 2011). In addition, most of the previous research was done in the ESL context and the number of papers examining co-writing in the EFL context is very small. This scarcity is the thrust of the current paper.

**Research Questions**

The current study aimed to investigate if the cognitive complexity of tasks does matter in L2 learners' collaborative writing task performance in terms of complexity, accuracy, and fluency through increasing the level of reasoning demand and prior planning for task completion. Therefore, the following research questions were addressed:

***RQ1.*** *Does the cognitive complexity of a task make any difference in EFL learners' individual writing task performance in terms of complexity, accuracy, and fluency?*

***RQ2.*** *Does the cognitive complexity of tasks make any difference in EFL learners' collaborative writing task performance in terms of complexity, accuracy, and fluency?*

## METHOD

**Participants**

The participants of this study comprised 70 male and female Iranian intermediate EFL learners aged between 18 and 24, who shared Persian as their first language. They were undergraduate students of the Islamic Azad University of Arak who had passed two general English grammar courses in two succeeding semesters and were participating in an Advanced Writing Course at the time of conducting the research, receiving instruction for 90 minutes each session, a session a week.

**Instruments**

The following instruments were utilized in this study:

**Oxford Placement Test**

Oxford Placement Test (OPT) (Edwards, 2007) was administered to 76 undergraduate university students to assure that they were approximately at the same level of English language proficiency.

The test included a cloze test and multiple-choice items measuring grammar, vocabulary, reading, and writing. As a result, 70 learners whose scores fell within one standard deviation above and below the mean score were selected as the participants for the study.

**UCLES/RSA**

UCLES/RSA Certificates in Communicative Skills in English were used to rate the writings elicited from the participants.

**Procedures**

In the first sessions, a model of writing was introduced to the participants through a couple of examples in order for them to get acquainted with the model-based writing. Then, they were asked to propose some topics they desired to write about during the project, in order to have a maximum level of topic familiarity. The most agreed-upon topics were then selected, from which the researcher chose eight topics for the study. The topics were put in a certain order to be followed during the research.

Since the researcher selected two independent variables, that is, the degree of

reasoning and planning to evaluate the two dependent variables--individual and collaborative writing of a single group of participants, the following tasks were designed:

1. simple task, completed individually, without prior planning (ISNP)
2. simple task, completed individually, with prior planning (ISP)
3. complex task, completed individually, without prior planning (ICNP)
4. complex task, completed individually, with prior planning (ICP)
5. simple task, completed collaboratively, without prior planning (CSNP)
6. simple task, completed collaboratively, with prior planning (CSP)
7. complex task, completed collaboratively, without prior planning (CCNP)
8. complex task, completed collaboratively, with prior planning (CCP)

Simple tasks show the tasks for which the participants are supposed to provide descriptions of the topic, while complex tasks refer to those in which they must argue about the topic providing reasons to support their idea. Thus, in this study, the participants were required to write at least 150 words within 20 minutes.

For simple tasks, and at least 200 words within 40 minutes for complex tasks. For the tasks containing prior planning, another 10 minutes were added.

After the first individual writing task, the writings were evaluated and classified into four levels based on the UCLES/RSA Certificate in Communicative Skills in English (writing skills). The same evaluation and classification were made by another rater and the inter-rater reliability was measured (0.87). Based on the ratings, 20 participants were selected as the group leaders and two or three participants were chosen as their group mates. It is to be noted that all groups were formed by both male and female participants in order to reduce the effect of gender on the research results. The leaders were then provided with some guidelines by the researcher concerning how to deal with group members and control them during collaborative writing tasks. When the writings were elicited from each participant on the above-mentioned 8 tasks, the researcher evaluated them in terms of complexity, accuracy, and fluency. The measures were mostly the same as those used in other similar studies (e.g. Ellis and Yuan, 2004; Foster and Skehan, 1996; Storch, 2005; Wigglesworth and Storch, 2009). Complexity was gauged through the percentage of clauses to T- units (C/T), which is a reliable measure according to Foster and Skehan (1996). To evaluate the accuracy, he percentage of error-free T-units compared to all T- units (EFT/T) was utilized (Wigglesworth and Storch, 2009). Fluency was measured in terms of word number average, T- units, and clauses for each text.

**RESULTS**

To find the answer to the first research question, paired samples *t*-tests were conducted for each pair of variables. The following obtained results are tabulated below. The above three paired-sample *t*-tests were conducted to evaluate the performances of individual participants in terms of fluency, accuracy, and complexity of their simple and complex writing tasks with no planning time available. Only one statistically significant difference was observed for Pair 3, that is complexity in individual simple writing tasks with no planning time ((M=1.91, SD=.56, N=70) and complexity in individual complex writing tasks with no planning time (M=2.11, SD=.75, N=70), with a statistically significant mean difference of .20 at $t$ (69) =1.80, $p<.05$ (two-tailed). It is evident that the complexity of students' writing increased when they were required to carry out complex writing tasks when no planning time was available in both situations. The mean increase in writing complexity for tasks with no planning time was .20 (93) with a 95% confidence interval ranging from .02 to .42.

Also, the above three paired-sample *t*-tests were conducted to evaluate the performances of individual students in terms of fluency, accuracy, and complexity of their simple and complex writing assignments with planning time available. Again, only one statistically significant difference was observed for Pair 1, that is fluency in individual simple writing tasks with planning time (M=101.61, SD=23.85,N=70) and fluency in individual

complex writing tasks with planning time (M=93.45, SD=22.82, N=70), with a statistically significant mean difference of 8.16 at *t* (69) =1.99, *p*<.05 (two-tailed). Thus, the fluency of the participants' writings decreased when they were required to carry out complex writing tasks when the planning time variable was held constant and all students in both groups had some time to plan. The mean decrease in writing fluency for complex assignments with planning time was 8.16 (34.2) with a 95% confidence interval ranging from .01 to 16.32.

**Table 1**

***Paired Samples Test for ISNP and ICNP***

| Paired Samples Test | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Paired Differences | | | | | | | |
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | M | SD | Std. Error Mean | Lower | Upper | t | Df | Sig. (2-tailed) |
| Pair 1 | Fluency in ISNP - Fluency in ICNP | -5.26 | 26.54 | 3.17 | -11.59 | 1.06 | -1.65 | 69 | .10 |
| Pair 2 | Accuracy in ISNP - Accuracy in ICNP | .003 | .28 | .03 | -.06 | .07 | .10 | 69 | .91 |
| Pair 3 | Complexity in ISNP - Complexity in ICNP | -.20 | .93 | .11 | -.42 | .02 | -1.80 | 69 | .04 |

**Table 2**

***Paired Samples Test for ISP and ICP***

| Paired Samples Test | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Paired Differences | | | | | | | |
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | M | SD | Std. Error Mean | Lower | Upper | t | Df | Sig. (2-tailed) |
| Pair 1 | Fluency in ISP - Fluency in ICP | 8.16 | 34.20 | 4.08 | .01 | 16.32 | 1.99 | 69 | .04 |
| Pair 2 | Accuracy in ISP - Accuracy in ICP | .00 | .33 | .03 | -.07 | .08 | .01 | 69 | .98 |
| Pair 3 | Complexity in ISP Complexity in ICP | .01 | .75 | .09 | -.16 | .19 | .20 | 69 | .83 |

To find the answer to the second research question, the following paired-sample *t*-tests were run for each pair while the tasks were completed collaboratively. Based on the above Table, two statistically significant differences were observed for Pair 2 and Pair 3, that is, accuracy in collaborative simple writing tasks with no planning time (M=.63, SD=.17, N=20) and accuracy in collaborative complex writing tasks with no planning time available (M=.75, SD=.19, N=20), with a statistically significant mean difference of .11 at *t* (19)=1.85, p<.05 (two-tailed) as well as complexity in collaborative simple writing tasks with no planning time (M=1.90, SD=.26, N=20) and that in collaborative complex writing tasks with no planning time available (M=1.65, SD=.27, N=20), with a statistically significant mean difference of .25 at *t* (19)=2.797, *p*<.05 (two-tailed).

Actually, the accuracy of the participants' writing tasks increased when the participants

were asked to do collaborative complex writing tasks, with planning time available; while the complexity of their writing tasks decreased when they were asked to do collaborative complex writing tasks with no planning time available.

**Table 3**

***Paired Samples Test for CSNP and CCNP***

| Paired Samples Test | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Paired Differences | | | | | | | |
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | M | SD | Std. Error Mean | Lower | Upper | T | Df | Sig. (2-tailed) |
| Pair 1 | Fluency in CSNP - Fluency in CCNP | -1.91 | 14.40 | 3.22 | -8.65 | 4.82 | -.59 | 19 | .56 |
| Pair 2 | Accuracy in CSNP - Accuracy in CCNP | -.11 | .27 | .06 | -.24 | .01 | -1.85 | 19 | .04 |
| Pair 3 | Complexity in CSNP - Complexity in CCNP | .25 | .40 | .08 | .06 | .43 | 2.797 | 19 | .01 |

**Table 4**

***Paired Samples Test for CSP and CCP***

| Paired Samples Test | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Paired Differences | | | | | | | Sig. (2-tailed) |
| | | | | | 95% Confidence Interval of the Difference | | | | |
| | | M | SD | Std. Error Mean | Lower | Upper | T | Df | |
| Pair 1 | Fluency in CSP - Fluency in CCP | -8.16 | 9.70 | 2.16 | -12.70 | -3.62 | -3.76 | 19 | .001 |
| Pair 2 | Accuracy in CSP - Accuracy in CCP | .11 | .27 | .06 | -.02 | .23 | 1.75 | 19 | .10 |
| Pair 3 | Complexity in CSP -Complexity in CCP | -.13 | .61 | .13 | -.42 | .15 | -.97 | 19 | .34 |

To assess the collaborative performances of the participants in connection with fluency, accuracy, and complexity of their tasks with no planning time available, the above three paired-sample *t*-tests were conducted. A statistically significant difference was observed just for Pair 1, that is, fluency in collaborative simple writing tasks with no planning time (M=96.83, SD=5.42, N=20) and fluency in collaborative complex writing tasks with no planning time available (M=105.00, SD= 9.57, N=20) with a statistically significant mean difference of 8.16 at $t$ (19) =3.76, $p$<.05 (two-tailed). The increase of the mean here in writing fluency for assignments with no planning time was .8.16 (9.70), with a 95% confidence interval ranging from 3.62 to 12.70. This means that writing fluency increased dramatically when the participants' generated writings were complex as opposed to those in simple tasks, and when they were given some planning time before they began to accomplish the tasks.

**DISCUSSION**

When comparing the ISNP with the ICNP in terms of system complexity, the results obtained differ from the results obtained by Robinson (2001) and Ishikawa (2006) who say that increasing task complexity leads to more complex production. This awareness can be explained by the fact that, according to the Skehan and Foster (2001) model, increased task

complexity attracts students' attention from language to language. This finding is consistent with that of Sadeghi and Mossali (2013) who argue that increasing the complexity of functions leads to significant differences in syntactic complexity. At the same time, there are similarities between the results of the current study and those of Frear and Bitchener (2015), which show that the complexity of the task greatly reduces syntactic complexity, using a T-units scale measurement where independent phases were present and measured separately. However, the results are contrary to those of Lan (2015) showing that more difficult tasks can attract more complex language. In addition, the findings of Rahimi's (2018) study contradict the findings of the current research, as they show that the increase in task complexity significantly affects syntactic complexity.

The findings noted above may be rationalized on the basis that the applied levels of task complexity were inconsistent with the level at which participants' ability to use specific structures was developed. Another possible reason is that, compared to simple tasks, complex tasks have become more complex, meaning that predictable outcomes are not available as in addition to a certain level of complexity of tasks, participants' attention will be overstated due to their expertise level. In other words, participants may alter the production of certain language structures. Another predictable cause of these effects may be the pragmatic requirement for certain types of activities (Bygate, 1999), because different types of activities require different levels of subordination.

The results of the study concerning the impact of task complexity on accuracy between simple and complex tasks are consistent with those of Hosseini and Rahimpour (2010), Khomeijani Farahani and Meraji (2011), and Salimi, et al. (2011), for none of them found significant differences in this regard. Skehan (1998) argues that modality plays a major role in the amount of cognitive complexity and the distribution of attention. Therefore, writing can provide more space for students to give their attention to form. Thus, possible monitoring in both simple and complex situations may result in equal measurement for both parties. In terms of fluency in the ISNP and ICNP, the results are similar to those of Ong and Zhang (2010) and Abdollahzade and Fard Kashani (2012) whose research did not yield significant results concerning fluency when task complexity is increased.

## CONCLUSION

Overall, the findings of the study show that complexity and accuracy keep pace with each other, but not with fluency. This is due to the fact that learners' attention is focused on both of them as a result of conceptual activation during the stage of planning with deeper semantic processing. Actually, when pre-task planning is concerned, some monitoring takes place so that the learners have the opportunity to think about the content as well as the organization of the output. As for fluency, the amount of attention for it is not as much as that required for complexity and accuracy. According to Gillabert (2009), higher fluency is not the result of allocating attention, but the result of faster access to the selection of lexicon.

As for the differences between the accuracy and complexity of collaborative simple and complex writing tasks with no planning time available (ISNP and ICNP), and with planning time (CSP and CCP) no significant differences were found. It may be due to the fact that the participants' cooperation instead of collaboration. In cooperation, every participant is in charge of one aspect of writing e.g. grammar, organization, spelling, etc.; whereas in collaboration, they work together for problem-solving and achieving a shared outcome. Finally, it has to be noted that there have been few similar studies comparing the differences in writing performance while considering two factors of planning time and task complexity in a single research. One or two studies have compared such conditions, but their findings are not comparable with those of the present research, since they have manipulated both variables of planning and immediacy of time and space simultaneously (Khomijani Farahani and Meraji, 2011). The

findings of the current study have pedagogical implications for teachers, syllabus designers as well as curriculum developers to sequence the process of teaching so that the learners can tackle the cognitive complexity load the tasks have on them.

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