

The Relationship between Iraqi EFL University Students' Cognitive Flexibility and Writing Performance

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Abstract

One of the main significant purposes of learning the English language is the need to have an effective communication allowing for exchange and transmitting information. As a basic form of human communication that allows people to connect, communicate, and share experiences with one another is writing skill. Through practicing trainable abilities like speaking, and writing, adaptation skills are required to overcome issues that develop in unfamiliar environments. Learners must be cognitively flexible to reconstruct and adjust to these situations' demands. This study aims at looking into the level of cognitive flexibility and writing abilities of Iraqi EFL university students. It also seeks to determine how these two variables are related. It is a correlational one, through which two instruments are employed (a questionnaire for measuring cognitive flexibility, and an essay writing for testing writing). After their validity and reliability have been confirmed, the study's instruments are administrated to 400 participants chosen at random from three English departments at Universities of Babylon, Thi- Qar and Kirkuk. The statistical manipulation of the data shows that the participants have a moderate level at cognitive flexibility whereas a good level at writing productivity. In addition, the results have shown that there is a statistically significant relationship between the participants' writing proficiency and their level of cognitive flexibility.

Key Words: Cognitive Flexibility (CF), Writing Performance (WP), English Foreign Language (EFL).

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1. Introduction

1.1 The problem and its Significant

one requirement of communication is that communicators could be able to adapt to a range of situations, but most importantly, that they think about possibilities and different methods of acting to satisfy the demands of various circumstances. Thus, flexibility is essential property for conveyance because it enables shifting and changing as needed to the situation by selecting particular actions, utterances and expressions (Chesebro & Martin, 2003). An important part of cognitive executive function is CF which enables the flexible thinking to move between two separate concepts or to think about many concepts simultaneously (Sapmaz & Doğan, 2013). In addition, it bounds one's capacity to draw conclusions from many viewpoints, to consider alternative responses, and to modify certain behaviours in response to shifting contexts (Johnco et al., 2013). On the other hand, WP for non-native English speakers, is an increasingly important skill as it is a basis of learning process in both academic and professional settings. The development of this creative ability will help the students in learning other vital language skills and components to increase their competency and bolsters their thinking to express their ideas (Harmer, 2007). From communication point of view, writing skill is one approach to provide diversity in classroom activities which supplies the students with the tangible proof of their accomplishments so that their progress could be seen easily. It helps them in their comprehension of the vocabulary and grammatical structure and enhances other language skills in discovering new ways of expressing ideas (Screen & Ilankumaran, 2018). Besides creating ideas, considering how to communicate them, and organizing them into sentences and paragraphs, a student should also focus on his /her writing style and form, especially to the

correct use of words, syntax, spelling and punctuation so as to produce coherent, clear and lucid writing (Ur, 2012). Even after years of English language instruction, most Iraqi EFL students still need to improve their writing skills (Kadhim & Abbas, 2019). WP is a general problem-solving activity requiring high cognitive skills e.g., articulating and developing a viewpoint on an issue, organizing pertinent material, and creating an effectively supported argument (Johnstone et al., 2002). The main reasons behind that include the ineffective teaching strategies that concentrate on having the students follow certain processes in writing. Also, the unfavourable attitudes that some students may have towards this process, which calls for the teachers to motivate them and engage them with writing tasks in a pleasant setting (Ulaywi, 2021). From a survey of the literature, it appears that no research has looked at the connection between Iraqi EFL University students' WP and CF. Effectively bridging this gap is the goal of the present investigation. Therefore, there is a critical need to consider how CF and WP are correlated and find out whether CF has an impact on the language competence of WP or not.

1.2 Research Questions

The study makes an attempt to answer the following:

- 1- What are Iraqi EFL university students' levels of CF, and WP?
2. Is there a relation between those students' level of CF, and WP?

2. Literature Review

2.1 Cognitive Flexibility: Definition

Cognitive Flexibility is seen as a crucial aspect of executive functioning required for effective environmental adaption in a constantly changing environment; it is an important capacity of human cognition to adapt to changing circumstances through creativity and flexibility rather than by sticking in one particular state (Grange & Houghton, 2014). Cognitive structures and cognitive operations form a coherent system of mental processes that enable a thinking individual to generate concepts, resolve issues, and reach conclusions

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(Krebt,2022). One more pertinent explanation is propounded by (Buttelmann and Karbach, 2017) who assert that CF is as an intrinsic component of mental process that allows switching, controlling persons' actions to successfully shift from one stimulus to another. The intention of this shifting is to stimulate learning transfer of knowledge and to prevent "inert knowledge," or the knowledge that a learner can replicate, however, he /she fails to apply in new circumstances demands (Spiro & Jehng, 1990). Openly, CF has been defined from different attitudes, for instance, it may be defined as the ability of a person to adjust to the shifting requirements of the local environment, including social, academic, and emotional fields of life which permits people to go more easily through life's challenges and unforeseen circumstances by presenting solutions to those issues that are encountered in interaction (Stange et al., 2017). Basically, CF is connected with two different sorts of interactions which are the interaction of different sensory mechanisms and the interaction of various cognitive processes, and it is beneficial for creative outcomes and supporting immediate problem solving (Ionescu, 2012). As far as problem solving is concerned, CF has been defined as an ability to adjust the learners' problem solving when task demands are modified (Kerms, 1995). As a component of communication, CF refers to the ability to choose one's own behaviour which is made up of three subcomponents which are : awareness, willingness and self-efficacy. Flexible individuals are aware of alternative behavioural options in every given circumstance, willing to be flexible and have self-efficacy in being flexible (Martin & Anderson,1998).

2.1.1 Types of Cognitive Flexibility

Eslinger and Grattan (1993) claim that CF is broken into at least two components, namely spontaneous flexibility and reactive flexibility. The

category of spontaneous flexibility includes the capacity for creative diversity, thoughtful alternative responses, and plan modification. It is the continuous flow of concepts searched out impulsively in response to open-ended queries. This general type of CF is divided into two distinct subtypes of that are known as (ideational fluency) and (divergent thinking or semantic spontaneous flexibility). Ideational fluency, which is the first, relates to the capacity for producing lots of ideas. The first one refers to the ability to produce large numbers of ideas (ideational fluency) and the other one, which has to do with having the capacity to come up with different concepts which often pertains to as lateral thinking, is the process of creating many, original ideas or solutions to the issue which the individual is seeking to tackle. They (1993) add that through spontaneous, free-flowing thought, divergent thinking require producing many different solutions or ways to proceed. Individual must produce ideas by using a variety of efficient search tactics to switch between classes and categories of knowledge if they want to be spontaneously flexible.

Reactive flexibility, on the other hand, describes the ability to alter reaction patterns in satisfying shifting requirements. This ability is linked to the capability of inhibiting learned behaviour, shifting focus, self-monitoring, and regulating performance, and is critical for social engagement, the development of new knowledge and skills, and academic success (Grattan & Eslinger ,1989). Moreover, it encompasses the capacity to freely adjust cognition and conduct in response to altering task or situational demands (Rende, 2000).

2.1.2 Cognitive Flexibility in EFL Settings

Through utilizing language as a tool for communication while investigating various situations, students will witness how meaning is created, how language adapts to new information, how language changes in response to social movements, and how language is always prepared to be an important tool when innovating (kamil, 2016). CF is considered as a crucial component of individual's intellect, and has been connected to learning processes, especially

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language development. To put it another way, language improves manifestation of flexible cognition and allows for a variety of encoding and creative representational processes as well as skills for processing linguistic and nonlinguistic signs, which are necessary for language learning (Kail, 2003). For language discipline, CF is integral involvement to learning language because most language learners, and teachers encounter situations and surroundings that are not entirely predictable in terms of language, or only teach and learn words and sentences using learned sequences. However, when they run into unforeseen events, they call for CF to deal with brand-new issues (Deak, 2003).

Studies have demonstrated a positive correlation between CF and language abilities fluency in English language (Ritter et al., 2012). Therefore, it is obvious that incorporating CF into language courses is an essential sustenance for achieving learning objectives as learning a second or foreign language has a beneficial relationship with having CF (Xie ,2014). In this connection, Littlemore, (2009) leads to the belief that those who speak two languages exhibit more CF than people who only speak one language, that is, bilinguals possess the ability to switch with flexibility between differing tasks, information, and select the one that is more pertinent to the scenario at hand by adopting specific cognitive techniques beyond language .

The key finding of some studies on the relationship between CF and foreign language learners concludes that the bilingual individuals can educate their brain to be more flexible and that genetically affected CF may have an impact on switching capacity, promoting individuals' likelihood of becoming bilingual language (Schwieter, 2019).

It has also been found that CF appears to be correlated with conversational sensitivity to the point that it may be regarded as a key element of

conversational sensitivity in that communicators who are conversationally attentive are aware of their options for navigating and controlling the direct of conversations and of the possible indicators that they may pay attention to

Martin, 2003). &(Chesebro

2.2 Writing Skill : Definition

Writing skill is the most crucial skill in language learning and instruction. It is a productive talent since it requires information generation and processing, to enhance intellect (Mohammed & Jasim, 2022). It is a visual form of communication, either printed in hard-copy or in electronic form which involves such processes as generating ideas, discovering a voice with which to write, planning, goal-setting, monitoring and searching for language to express exact meaning (White & Arndt (1991). Writing skill serves as a medium for more than just communication; it also allows individuals to convey their thoughts and feelings to one another. However, due to the act of writing, words become permanent, like so, it increases the capacity of the human collective memory from the relatively little store that individuals can recall and transmit verbally to the limitless storage of contemporary library (Raymond, 1980). This definition of writing is highly supported by Brown (2004) who promotes the idea that writing in fact is a form of thinking by which individuals are able to freeze their thoughts, making them permanent and visible so they can later review and evaluate their quality. In this respect, Flower and Hayes (1981) define writing skill as a mental process involving three main components: the task environment which includes the author's outside control things, the rhetorical challenge and the growing text; the author's long-term memory, where knowledge has been stored, and the writing processes of planning, translating, and reviewing, which are under the control of a monitor. Broadly "writing is an act of typing letters and characters on different materials such as paper, wood and the purpose is to recording thoughts and idea. It is including encoding of message of same kind that people are able to translate their

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thoughts into written language” (Alsalihi, 2020). Lastly, writing is a sophisticated activity that allows for transformation of thoughts, development of ideas, discovery of meaning, and organization of those thoughts into phrases and paragraphs. As a skill, writing requires a variety of difficult rhetorical and linguistic procedures which must be taught in order to avoid ambiguity, and ellipsis in some writings (Nation, 2009).

2.2.1 The Significance of Writing Skill

Nodoushan (2014) denotes that writing is a skill that is essential for the learning process and is regarded as one of the most challenging among other skills. However, writing ability has the power to influence students' academic achievement as it allows the students to reinforce the grammatical structure, increase the vocabulary, create the scientific framework of human life either verbally or in writing form, and improve other language skills. Writing is the act of capturing language on a surface as standardized visual markings or graphic indicators (Al-Kubaisy, 2018)

It is emphasized that writing is a thinking tool not just in the sense that it may be used immediately in everyday situations, but also in isolation as a skill or aptitude. It is a tool for critical thinking, language development, and, by extension, learning across all subject areas (Noaman, 2013).

As Brown and Lee (2015) remarks that when a person writes, he or she strives to convey everything he/she knows about it by reliving their memories, experiences, accomplishments, failures, status, potential futures, and so on. These lead to an enhancement in memory, mental acuity, creativity, and imagination. Moreover, Harmer (2004) imparts that writing ability is simply a crucial component of communication that can also advance communication and thinking abilities since writing enables individuals to pass on a message to a far

greater audience than through face-to-face or telephone interactions. Rao (2007) appreciates the importance of writing in teaching of English language, according to him, writing "stimulates thinking, compels students to concentrate and organize their ideas, and cultivates their ability to summarize, analyze, and criticize. On the other hand, it reinforces learning in, thinking in, and reflecting on English language". In contrast to speaking, writing as implied by Renandya (2002) is a talent that lets the student to carefully consider their notions before coming up with the words and sentences to build their views in a structured manner giving their thoughts some organization. Through writing, a student can select the befitting language, create the convenient sentence structure, use cohesiveness, and express the ideas in the right method and also give the student the ability to be more elegant, succinct, and eloquent than they can through speech, which will eventually help in the development of excellent oral skill. He (2002) appends that writing assists not only the students in their academic activity but also the professionals in expressing their concepts.

2.2.2 Elements of Writing Skill

Weigle (2002) points out five measurable components in writing. They are content, organization, language use (syntax and discourse), vocabulary and mechanics. Here is an explanation of each element.

Content: A good content copes with the "thesis statement, related idea, development of idea through personal experience, illustration, fact and opinion". Beside it compasses the information it contains, the topic, the related explanations or discussions, and the essence of the major issue raised (Brown, 2000).

Organization: As an order, organization takes into account "the effectiveness of introduction, logical sequence of ideas, conclusion and appropriate length". In a written text, the arrangement of each sentence or paragraph should be perceptible which is what it signifies (Brown, 2000)

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Language use: The language use includes all aspects of language formation, structure, and components used in written texts, such as sentence complexity and grammar (Brown, 2000).

A. Discourse: The samples of language conventions covers aspect like topic sentences, paragraph unity, transitions, discourse markers, cohesion, rhetorical rules, reference, fluency, economy, and variation (Byrne, 2000).

B. Syntax: Syntax is one of the primary means through which authors express meaning in a work, both in spoken and written language. It basically refers to the set of guidelines that define how words are combined and arranged to make phrases, clauses, and sentences (Miller, 2008).

Vocabulary: Choosing the right words is crucial when creating a text of a high - quality as vocabulary is one of the key elements which the writers need to have before they create the purpose language. The likelihood of a better quality increases with the number of vocabularies employed in a text (Cumming, 2001).

Mechanics: It considers significant detail taking into account the writing's technical aspects such as spelling, grammar, capitalization, citations, overall neatness and presentation, the style of handwriting employed, as well as whether it is understandable or not (Weigle, 2002).

3. Methodology

3.1 Population and Sampling

A population is any set of distinct items of individuals or nonhuman entities, institutions, times, units, etc., which have some common features (Yahya, 2017). The population of this study covers the total number of (603) EFL students at colleges of education. A sample is a collection of people, things, or events appointed to represent the traits of the broader group from which it is selected (Mills & Gay, 2019). The selective sample implicates 400 students

intently chosen from the 4th year students of the English Departments of the Colleges of Education for Human Sciences / Universities of Babylon (150 students), Thi- Qar (150 students), and Kirkuk (100 students) for the academic year (2022-2023).

3.2 Instruments of the Study

To measure the variables of the study, two instruments are applied:

3.2.1 The Cognitive Flexibility Scale

The second instrument used in the present study is the CF scale which is built up of 20 items evaluating a variety of aspects of CF significant for functional communication. Those items reflect aspects of flexibility such as, the tendency to comprehend difficult situations, the ability to understand multiple alternative explanations for human behavior, and the ability to bring about multiple alternative solutions to hard situations. This scale is a five point Likert scale in which the students assign their level of agreement from strongly agree (5) to strongly disagree (1). As a further matter, the higher score to be gained by the students is (100), though the lower score is (0), so the mean is also (60).

See Appendix (A).

3.2.2 The Writing Performance Test

The second instrument applied in this study is a test. To understand the state of students' standard of WP, an essay writing is constructed by the researcher. The selected topic is exposed to a number of jurors who are experts in the field of ELT and linguistics. Five categories of writing skill : (Organization, Content, Grammar, Mechanics and Style) are evaluated in the assessment. Respecting the scoring scheme, it is adopted by Brown and Baily (1984) with a rating scale (1-5). The highest score achieved by the students is (25) and the lowest score is (0) with the theoretical mean for the test is (15) score. See Appendix (B).

3.3 Face Validity

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Face validity refers to subjective assessments of the presentation of the measuring instrument as to whether the items in the instrument appear to be related, rational, and clear (Oluwatayo, 2012). Practically, the assessment of face validity can be achieved by having experts in the field of study to offer the suitability of the measuring instrument for its intended use (Anastasi & Urbina, 2007). Therefore, the concern measures of the study are exhibited to jurors of twenty-three specialists in the field of methods of teaching English and the field of linguistics to set judgments and express their views concerning the suitability of the items of each measure. They are accredited by the experts with kind of modifications.

3.4 Test Reliability

In the present study, test-retest reliability and internal consistency are the two types of reliability that are investigated.

3.4.1

Test-Retest

A test-retest reliability is an estimable design settles the stability and consistency of a certain test where it is given on one day and then it is repeated a few days after the first attempt (Nelson et al., 2015). For the sake of evaluating the test-retest reliability, again the CF scale is administered to the pilot sample of (30) students chosen at random two weeks after the first administration. Applying Pearson correlation coefficient to measure reliability of the two sets of responses show that the reliability coefficient for the scale is (0.89), which is an indicator of a good reliability since the value is higher than (0.70)(Whitley, 2002).

3.4.2 Internal Consistency

The other prime way by which the internal consistency among the scale items is measured is the Alpha-Cronbach Formula as to be considered as a measure of scale reliability. The reliability coefficient is found to be (0.87) which demonstrates a good internal consistency as noted by (Cohen et al., 2007) that the Cronbach's Coefficient should take on values ranging between (0) and (1).

3.5 The Application of the Instruments

Once the validity and dependability of the instruments have been confirmed, the two instruments of the current are applied in various ways. In accordance with their responses, the students' responses are assigned scores. Before handing the sample subjects the test sheets, they are given a full explanation of the test and the questionnaire's items and are friendly instructed to answer on the same piece of paper in order to save time and effort. In addition, they are requested to ask any question that they may have about any unclear topic and to write their names and serial numbers on each test sheet. The researcher uses the scoring systems mentioned in the earlier sections to conduct the test scoring technique.

4. Results

To achieve the first aim of the study, which relates to the students' level of CF and WP, the two instruments are applied to the study's sample. Regarding EFL students' level of CF, the statistics result that the mean score is (60.902) with a standard deviation of (9.517) while the theoretical mean is (60). To assign the significance difference between the mean score and the theoretical one, a t- test for one independent sample is also applicable, which demonstrates that the computed t- value (1.897), is smaller than the critical one (1.96) at a level of significance (0.05) and degree of freedom (399). The results emerge that difference in side of the mean score is not statistically significant. In consequence, the students are at a moderate level of CF. See table (1) and figure (1):

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Table (1)

The Mean Score, Standard Deviation and T-Value of the CF

Variable	Sample Size	Mean	S.D	Theoretical Mean	T-Value		Significance 0.05
					Computed	Critical	
CF	400	9020.6	9.517	60	1.897	1.96	Not Significant

As for the students' level of writing proficiency, a WP test is run to the sample of the study. After scoring the students' responses using a rating scale, the results reveals that the mean of the sample responses is (15,165), with a standard deviation of (3,707), and a theoretical mean (15). The calculated T-value is (6.285), which is statistically significant as it is higher than the critical value (1.96), at a level of significance (0.05) and a degree of freedom (399).

This means that the sample has a good level of WP, as in table (2):

Table (2)

The Theoretical Mean, Standard Deviation, and T-Value for the WP

Variable	Sample Size	Arithmetic Mean	S.D	Theoretical Mean	T-Value		Significance 0.05
					Computed	Critical	
WP	400	1656.1	.3707	15	6.285	1.96	Significant

Concerning the correlation between “Iraqi EFL university students’ CF with the level of WP”, the students’ responses of both are interpreted using Pearson correlation coefficient and the results are appeared in the next table below:

Table (3)

The Correlation between CF and WP

Variable	Sample	Correlation Coefficient between CF and WP	T-Value		Significance (0.05)
			Computed	Critical	
WP	400	0.501	11.386	1.96	Significant

What stand out in the table above are:

The estimated correlation coefficient value between CF and WP is amount to (0.501). Intending to calculate the significance of the correlation, a t-test for one sample will be the means. The achieved results reveal that the calculated t-value results a value of (11.386), which goes beyond the critical value (1.96) at the level of significance (0.05) and a degree of freedom (398). This indicator indicates that the correlation between CF and WP is a direct significant one, that is, the higher the CF the higher the sample's level in WP.

4. Conclusions

The conclusions drawn through the data analysis and interpretation

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pertaining to the study's aims conclude with the following:

1. It has been brought to an end that EFL students possess a moderate level of CF. As for the English language WP, the study reveals that those students have a good level of WP.
2. It has been found that the research sample is affected differently by the WP and the CF variables.
3. It has also been concluded that the results found from the research tools indicate that the students' level of CF contribute to explain the variation in writing performance.

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Appendix (A)

The Cognitive Flexibility Scale

Instructions:

Read the following statements carefully and rate how much you personally agree or disagree for each one to reveal your beliefs and feelings.

Scale: 1 - 5 .

1. Strongly Disagree, 2. Disagree, 3. Uncertain, 4. Agree, 5. Strongly Agree.

Items	SD	D	UN	A	SA
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By

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	1	2	3	4	5
1. I am good at “sizing up” situations.					
2. I have a hard time making decisions when faced with difficult situations.					
3. I consider multiple options before making a decision.					
4. When I encounter difficult situations, I feel like I am losing control.					
5. I like to look at difficult situations from many different angles.					
6. I seek additional information not immediately available before attributing causes to behavior.					
7. When encountering difficult situations, I become so stressed that I cannot think of a way to resolve the situation.					
8. I try to think about things from another person's point of view.					
9. I find it troublesome that there are so many different ways to deal with difficult situations.					
10. I am good at putting myself in others' shoes.					
11. When I encounter difficult situations, I just don't know what to do.					
12. It is important to look at difficult situations from many angles.					
13. When in difficult situations, I consider multiple options before deciding how to behave.					
14. I often look at a situation from different view-points.					
15. I am capable of overcoming the difficulties in life that I face.					
16. I consider all the available facts and information when attributing causes to behavior.					
17. I feel I have no power to change things in difficult situations.					
18. When I encounter difficult situations, I stop and try to think of several ways to resolve it.					
19. I can think of more than one way to resolve a difficult situation I confronted with.					
20. I consider multiple options before responding to difficult situations.					

Appendix (B)

Writing Performance Test

Note: The total score is (25) marks , and the time allotted is (45) minutes.

In not less than (250) words write an essay on “ **Social Media**”.
Your focus should be on its Definition, Effects, Importance, Advantages and Disadvantage.

Support your standpoints with justification and examples from your own observations or experiences.

العلاقة بين المرونة المعرفية لدى طلبة الجامعة العراقيين دارسي اللغة الإنكليزية
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الخلاصة

تعد دراسة اللغة الإنكليزية لأغراض تواصلية هي اهم الأهداف التي عن طريقها يتم مشاركة المعلومات، وتبادل الافكار، اضافة الى التعبير عن الآراء ومناقشة المواضيع. و تأخذ الكتابة شكلاً أساسياً من أشكال التواصل البشري الذي تساعد في تبادل الخبرات ونقل الثقافات عن طريق ممارسة القدرات اللغوية القابلة للتدريب ، وهذا ما يلزم وجود مهارات التكيف للتغلب على المشكلات التي تتطور في بيئات غير مألوفة ، إن امتلاك مهارات المعرفة اللغوية قد لا يكون كافياً لإتقان اللغة بل من الضروري النظر في الدور الذي تلعبه المرونة المعرفية ، والتي تعد من العوامل التي تؤثر في العملية التواصلية عن طريق استعمال مهارات اللغة .

ولهذا فقد تم اجراء الدراسة الحالية لإيجاد مستوى المرونة المعرفية ، ومستوى الأداء الكتابي و تحديد مستوى الارتباط بين المهارتين لدى دارسي اللغة الإنكليزية كلغة أجنبية.

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هذه الدراسة عبارة عن بحث ارتباطي . تكونت عينة البحث من (400) طالب وطالبة من طلبة الصف الرابع من ثلاثة اقسام للغة الانكليزية/ من كليات التربية للعلوم الإنسانية / جامعة بابل (150) ، ذي قار(150) وكركوك (100). وقد اظهرت نتائج البحث ان طلبة عينة الدراسة يمتلكون مستوى متوسط في المرونة المعرفية ومستوى جيد في الأداء الكتابي وكذلك وجود علاقة ذات دلالة معنوية بين المرونة المعرفية والأداء الكتابي لدى دارسي اللغة الإنكليزية لغة اجنبية.

الكلمات المفتاحية: المرونة المعرفية، الأداء الكتابي، اللغة إنكليزية لغة اجنبية.