Iraqi EFL University Students' Metacognitive Regulation and Performance in Writing Skills: A Correlational Study

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Abstract:

Writing is an exceedingly complicated cognitive activity in which the writer must display simultaneous control over multiple factors. Effective writing skills may increase students' chances of success. Writing is a vital part of language. This present study designs to investigate the correlation between metacognitive regulation and writing performance among Iraqi EFL University students. A random sample of 360 students from several Iraqi universities (including Baghdad, Basra, and Mosul), colleges of education, and English departments was chosen throughout the academic year (2022-2023). Data is collected using two instruments: a questionnaire to examine metacognitive regulation and a writing test is conducted to assess their performance in written English. A correlational analysis is employed to investigate the relationship between metacognitive regulation and writing performance. The data suggest that Iraqi EFL university students have a good level of metacognitive regulation. Furthermore, the study found a positive correlation between metacognitive regulation and writing performance, indicating that students recognise the importance of monitoring their own comprehension and language production, effectively planning their tasks, and evaluating their performance in order to improve their skills. It demonstrates that students are actively engaging in metacognitive processes to enhance their learning outcomes.

Key Words: Metacognitive Regulation; Writing Performance; EFL

التنظيم ما وراء المعرفي والأداء في المهارات الكتابية لدى طلاب الجامعة العراقيين دارسي اللغة الإنجليزية كلغة أجنبية: دراسة ارتباطية

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الملخص:

تعد الكتابة نشاط معرفي معقد للغاية حيث يجب على الكاتب أن يُظهر تحكماً متزامناً في عوامل متعددة. مهارات الكتابة الفعالة قد تزيد من فرص نجاح الطلاب .لذلك ، تتناول الدراسة الحالية العلاقة بين التنظيم ما وراء المعرفي والأداء الكتابي لدى طلاب الجامعة العراقيين دارسي اللغة الإنجليزية كلغة أجنبية. وقد تم في هذه الدراسة اختيار عينة عشوائية مكونة من 360 طالباً من عدة جامعات عراقية (منها بغداد والبصرة والموصل) من كليات التربية – قسم اللغة الإنجليزية للعام الدراسي (2022–2023). من اجل تحقيق اهداف الدراسة ، تم جمع البيانات باستخدام أداتين: استبيان لقياس مستوى التنظيم ما وراء المعرفي وكذلك اختبار الكتابة لتقييم مهارات الكتابية لدى الطلاب. تم استخدام التحليل الارتباطي لدراسة العلاقة بين التنظيم ما وراء المعرفي وأداء الكتابة. وقد اظهرت النتائج أن طلاب الجامعات العراقية في مجال اللغة الإنجليزية كلغة أجنبية لديهم مستوى جيد من التنظيم ما وراء المعرفي. علاوة على ذلك، وجود علاقة إيجابية بين تنظيم ما وراء المعرفي وأداء الكتابة، مما يشير إلى أن الطلاب يدركون أهمية مراقبة فهمهم وإنتاجهم اللغوي، والتخطيط الفعال لمهامهم، وتقييم أدائهم من أجل تحسين مهاراتهم. وهذا يبين أن الطلاب ينخرطون بشكل فعال في العمليات ما وراء المعرفية والتي تقوم على تعزيز مخرجات التعلم الخاصة بهم.

الكلمات المفتاحية: التنظيم ما وراء المعرفي؛ أداء الكتابة؛ اللغة الانكليزية كلغة اجنبية .

1. Introduction

English language is the warehouse of world knowledge, because it is recognized as the means of instruction for higher learning globally (Al-Bayati, 2015). Professional. Mastering writing is the utmost complex task for English as a Foreign Language (EFL) student. EFL learners face challenges in creating and organizing ideas as well as in deciphering ideas into comprehensible texts (Nourdad & Aghayi, 2016). Chakarverty & Gautum (2000) define writing performance as reflective activity that requires enough time to think about the specific topic and to analyze and classify any background knowledge. In the same way, Olshtain (1991, p. 235) states, "Writing performance as a communicative activity needs to be encouraged and nurtured during the language learner's course of study".

On the other hand, Metacognition can be regarded as a particular sort of cognition, or more accurately, a subset of cognition. Schraw & Dennison (1994) defines Metacognition as the ability to reflect upon, understand, and control one's own learning. As stated by Brown (1987, p. 30), metacognitive regulation (MR) " is a dimension of metacognition; the means by which we regulate our cognition". Also, Ozturk (2017) indicates that MR refers to students' knowledge about the implementation of strategies and the ability to monitor the effectiveness of their strategies. When students regulate, they are continually developing and monitoring their learning strategies based on their evolving self-knowledge.

1.1 The Problem and its Significance

In Iraq, teaching English as a foreign language constitutes an important process in the whole educational system. Metacognitive regulation supports students in managing and optimizing their performance on language learning tasks. Students who possess metacognitive regulation skills can plan , monitor, and evaluate their language learning activities more efficiently. They can set specific goals, break tasks into manageable steps, and allocate their time and resources effectively. Therefore, both instructors and learners of foreign languages frequently encounter challenges and obstacles particularly throughout the process of learning and teaching productive skills. Thus, characteristics like metacognitive regulation have a significant role in the language learning process and overall performance of Iraqi EFL students. Attempts have been made to study how this variable is connected to the English writing performance of these students.

After reviewing the literature, no study has explored the relationship between metacognitve regulation and performance in writing skills among Iraqi EFL University students. The current study aims to fill this gap effectively.

1.2 Aims of the Study

The study aims finding out:

1. Iraqi EFL university students' level of metacognitive regulation and writing performance
2. The correlation between metacognitive regulation and writing performance.

1.3 Limits of the Study

The study is limited to:

1. Iraqi EFL university 3rd year students at the departments of English, Colleges of Education for Human Sciences, at Iraqi Universities (Baghdad, Basra and Mosul), except Kurdistan region.
2. The academic year 2022-2023.

2. Literature review

2.1 The concept of Metacognitive Regulation

Metacognition refers to the awareness and control individuals have over their own cognitive processes, including their thinking, learning, and problem-solving strategies. Flavell (1979), defines metacognitive regulation (MR) as referring to:

" **a set of activities that help learners control their learning, working on the basis of the metacognitive knowledge and referring to processes to ensure realization of learning goals. This management involves planning, monitoring, and manipulating the cognitive processes to obtain optimal learning outcomes" (p. 906**).

Referring to Flavell (1979), the 'meta' means higher-order cognition. It encompasses two sections: metacognitive knowledge and metacognitive regulation. The meta (higher-order) is 'thinking about thinking' and which strategies are recruited as the learner is thinking about how well he understood the text (monitoring). If he did not get well, he may reread or use a dictionary (regulating).

Jafarzadeh (2016) indicates that Metacognitive regulation plays a crucial role in English language learning as it enables learners to take control of their own learning process, monitor their progress, and adjust their strategies as needed.

2.1.1 Metacognitive Regulation Theory

Schraw & Moshman (1995); Hartman (2013); Moshman (2018); Prather & Becker (2020); and Gross (2023) point out that several theories can be related to metacognitive regulation which including:

1. **Social Cognitive Theory (SCT)**

Social cognitive theory is a psychological theory that emphasizes the role of social and cognitive factors in human behavior. Developed by Albert Bandura, social cognitive theory suggests that individuals learn from observing and imitating others, as well as through self-reflection. SCT emphasizes the importance of self-regulation , self-efficacy and the use of cognitive strategies in achieving goals (Bandura, 2007). Self-regulation involves monitoring and controlling one's own behavior and cognitive processes, while self-efficacy refers to an individual's belief in their ability to achieve a particular goal or outcome (Zimmerman, 2000).

2. **The Information Processing Theory (IPT)**

One of the pioneers of cognitive psychology, was George Armitage Miller (1920–2012), who came up with the theory's name and looked at how the human brain processes and remembers information mechanically. When Miller first proposed his theories in the 1950s, there were already established theories of cognition. IPT suggests that cognitive processes can be broken down into discrete steps, including

attention, encoding, storage, and retrieval. This theory emphasizes the importance of metacognitive strategies in optimizing these processes (Kumaravelu , 2019).

3. Self-determination theory (SDT)

According to Yu, et al. (2023), Self-determination theory is a psychological theory that proposes that individuals are motivated by three basic psychological needs: autonomy, competence, and relatedness. This theory emphasizes the importance of intrinsic motivation and self-regulation in achieving goals. SDT developed by Edward Deci and Richard Ryan in (1986) which suggest that these needs must be satisfied in order for individuals to experience optimal well-being and achieve their goals (Deci & Ryan, 1986).

Thus, SDT emphasizes the need for individuals to feel competent and capable in their activities. When individuals believe in their abilities to engage in meta-cognitive regulation effectively, they are more likely to engage in these processes (Saxena, 2020). SDT suggests that providing individuals with opportunities for skill development, feedback, and mastery experiences can enhance their competence beliefs and subsequently foster their engagement in metacognitive regulation.

2.1.2 The Nature of Metacognitive Regulation in EFL

Educational experts are constantly pay attention in Metacognition, which are the study of human cognitive processes and the development of ways for strengthening and enhancing these abilities(Dawood & Ali, 2019). According to Piaget's theory, the mind makes up a meaning-making system that employs structured mental operations to access increasingly complex and abstract aspects and relations in the world (Adey et al., 2007; Dawood, 2021). Drigas et al. (2022) claim that the functioning of the whole cognitive mechanism depends on the development of the corresponding metacognitive mechanism that is hierarchically structured through self-organization and knowledge acquisition processes.

Flavell's (1976, 1979, 1981) conceptualization of metacognition does not directly relate to the process of learning a second or foreign language. However, he emphasises the importance of employing metacognition to enhance the understanding of several aspects of language development.

Furthermore, Anita Wenden has become known for being the pioneer in applying Flavell's model of metacognition to the study of second/foreign language learning and teaching. She has extensively researched and published on this topic, with notable works including Wenden 1987a, as well as practical manuals such as Wenden 1987b, 1991. Regarding second/foreign language instruction, Wenden (1998) argues that metacognitive "refers to the enduring understanding individuals possess about their own cognitive processes and those of others" (p. 516).

2.1.3 Components of metacognitive regulation

As mentioned by Baker (1989); Schraw & Dennisson (1994) ; Lai (2011); Mahdavi (2014); Dawood, (2013); and Stephanou & Karamountzos (2020), metacognitive Regulation includes three main components for facilitating the process aspect: *Planning, Monitoring* (involve three sub-components: a)

information management strategies, b) monitoring the comprehension, c) debugging strategies) *and Evaluating* . They are as follows:

1. Planning

As mentioned by Mahdavi (2014), *planning* encompasses the selection of appropriate strategies for learning language and the distribution of resources that are efficient in achieving goals. Schraw & Flowerday (2003, p. 1090) admit that "planning includes goal setting, activating prior knowledge and managing time allocation."

Schraw (1998) developed a regulatory checklist of planning to enhance metacognitive regulation, as highlighted by Dowling (2000) and Tanner (2012).

a. What is the task's nature?
b. What is the goal that I am aiming to achieve?
c. What in my previous knowledge and will it help me with this specific task?
d. In what direction do I want my thinking to take me?

2. Monitoring

Monitoring is the act of consistently controlling and overseeing the implementation of strategies in order to accomplish a particular goal (Cera et al., 2013).More specifically, it encompasses activities of self-observation, focusing on monitoring one's cognition, motivation, attitude, task demands, time, and need for assistance (Zimmerman, 2002; Krebt, 2023).

Similarly to Schraw (1998), Burner (2007, p. 39) presented a regulatory checklist of monitoring to enhance metacognitive regulation, as follows:

a. Do I have a full understanding?
b. Am I achieving my goals?
c. Should I adjust the pace depending on the difficulty?
d. What do I need to do if I do not understand?
e. Do changes needed to be made?

3. Evaluating

Evaluation "refers to appraising the products and regulatory processes of one's learning" (Schraw et al., 2006, p. 114). It is associated with the evaluation of outcomes achieved and the identification of the learner's reactions to these outcomes. Moreover, as Veenman et al. (2006, p. 8) state evaluation is "the process of assessing the progress achieved towards goals, which can then inform future planning, monitoring, and evaluation.

Likewise to Schraw (1998) and Burner (2007), Anderson (2002) highlighted a regulatory checklist of evaluation to improve metacognitive regulation, as follows:

a. Have I accomplished the goals?
b. How well did I perform?
c. How might I apply this line of thinking to other problems?
d. Do I need to go back to fill in any "blanks" in my understanding?

2.2 Writing Performance

2.2.1 Definition of Writing Skill

Writing is often regarded as the most complex language skill for those who are learning English as a foreign language because of its complicated grammatical structure, vocabulary, pronunciation and spelling (Rao, 2017).

Byrne (1988, p. 183) states that writing is "a process of encoding (putting messages into words) with a reader in mind". A Raymond (1980, p. 2) point out that writing is

"M**ore than a medium of communication, it is not only a way to communicate with each other but it also functions as a means of expressing ideas and emotions. Through writing, words are permanent, thus, it expands the collective memory of human beings from the relatively small store that people can remember and pass on orally to the unlimited capacity of a modern library**".

Chakarverty & Gautum (2000) define writing as reflective activity that requires enough time to think about the specific topic and to analyze and classify any background knowledge.

2.2.2 The Nature of Writing

Research in the field of writing indicated that this skill is quite difficult since it involves an extensive number of factors in order to produce the final output. It is more than just a representation of ideas; it is the exhibition of various processes in which the writer engages, including *cognition, problem solving, and social interaction* (Celce-Murcia et al., 2014, p.223).There are as follows:

1. **Writing as a Cognitive Process**

According to Fodil-Cherif (2021), the human's brain enables people to engage in various activities while attempting to write something. It enables them to explore the world around them, analyze it and then translate it by selecting an appropriate language (Shaimaa'Abdulbaqi Al-Bakri, 2011).. Celce-Murcia et al., (2014) claim that cognitive process is a set of skills and knowledge that reside within an individual. In this regard, Sinclair (2011) successful writers have a keen sense of observation, enabling them to connect speech and writing and acquire meaningful information. Brook & Blamire (2023) notes that human beings make sense of the world surrounding them via abstract mental structures called the schemata which represents their knowledge of things, events and situations. In addition, Brook & Blamire draw attention to the fact that there may be particular difficulties involved if one is required to read or produce content in a language that is not their native tongue. This is because different cultures have different conceptual frameworks.

2. **Writing as a Problem Solving Process**

As claimed by Ghafar & Mohamedamin (2022), writing is a complicated skill that necessitates the incorporation of numerous elements: in addition to linguistics knowledge and writing techniques, subject, purpose, and audience awareness must also be taken into account.

As Matsuda & Silva (2019) notes, writing is fundamentally a process of arrangement, in which sentences and paragraphs conform to predetermined

patterns. Therefore, learning of writing requires the ability to identify, internalise, and execute these patterns. Therefore, a proficient writer would consider these elements and devise suitable strategies that correlate with the goals of the writing (Al-Kubaisy, 2018).

Furthermore, according to Kern (2000), writing is an active process that demands critical thinking and the resolution of problems. In order to generate new information structures, the author must establish a correlation between the schemata and new elements. However, this creativity could not occur without an understanding of the culture of the society being addressed (Aziz, 2011; Elaf, 2022).

3. Writing as a Sociocultural Process

Celce-Murcia et al., (2014) claim that writing, as a sociocultural process, is considered part of a socially and culturally placed set of literacy practices shared by a specific community. From this perspective, learning to write is the process of becoming a member of a discourse community, which is a group of individuals (e.g., biologists, politicians, or even fans of a specific musical genre) who share beliefs and assumptions about language use as well as particular ways of utilising language (oral or written) for specific purposes. Academic writing, for example, has distinct rules for publishing papers in different fields, and some linguistic or stylistic choices, such as using the passive voice, may be deemed appropriate writing in one discourse community or discipline but not in another. Furthermore, sociocultural processes provide important insight into the fact that written texts do not exist in isolation; rather, the writings that writers create are moulded by and responsive to other preceding texts.

Writing as a sociocultural process occurs within a context that dictates which particular process to be followed the writer. In fact, as claimed by Chicho (2022), there are different steps to follow to write a meaningful piece of work. These stages namely planning, drafting and revising are common stages that each individual goes through, yet this cycle is flexible. That is depending on the context, "writers are immersed, they may decide what steps to take or follow in a particular process, so they may begin to revise at the moment they think about what to do, and some others immediately draft their ideas as they are generating them" (Camps, 2017, p. 15).

In light of this, it is possible to assert that writing practices are social processes due to the fact that they originate from the circumstances that around the writer (Ghafar & Mohamedamin, 2022; Khalil (2022).

3. Methodology

One of the critical decisions that a researcher should make is to select an appropriate design for research work. Correlational research is designed to determine the relationships between two or more variables (Curtis etat., 2016). According to Mills & Gay (2016), correlational research is referred to as descriptive research because it describes an existing relationship between variables and reveals the differences between them in order to describe and analyze,

collecting data to determine whether, and to what degree a relationship exists between two or more quantifiable variables.

3.1 Population and Sample

The population in the present study represents (4511) third year university students who are studying in morning studies in the Department of English at the Iraqi colleges of education for human sciences except Kurdistan region during the academic year 2022-2023. While the study sample consists 360 third-year university students who are selected randomly from the colleges of education in three universities: Baghdad , Basra and Mosul as is it displayed in Table (3.1) below:

Table 3.1 *Sample of the Study*

No.	University	College	Percentage	Sample
1	Baghdad University	College of Education /Ibn Rushd	35%	122
2	Basra University	College of Education for Human Sciences	35%	173
3	Mosul University	College of Education for Human Sciences	30%	65
Total			100%	360

3.2 Instruments

Two instruments have been used to achieve the present study's aims. The first one is ***metacognitive regulation questionnaire*** (MRQ), which has been adopted from Schraw & Dennison (1994). It consists of (35) items intended to measure the participants' level of metacognitive regulation. The MRQ is divided into three domains: *planning, monitoring, and evaluating*. The items are distributed as follows:

1. **Planning** = 7 items from (1-7) .
2. **Monitoring** = 22 items from (8-29) which includes three types:
    a. Comprehension Monitoring = 7 items from (8- 14).
    b. Information Management Strategies = 10 from (15-24).
    c. Debugging Strategies = 5 from (25-29).
3. **Evaluating** = 6 from (30-35).

The questionnaire is scored according to a five Likert scale of five points (strongly disagree, disagree, Neutral, agree, strongly agree), which are given the score of (1, 2, 3, 4, 5) respectively for the positive items. A total score for the questionnaire is calculated by summing the scores obtained by the respondent for each scale of the item chosen. The lowest score gets (35), while the highest score gets (175). Higher scores indicated to the higher levels of metacognitive regulation and vice versa for the lower scores

The second instrument, the ***writing performance test*** (WPT), is related with the essay writing test .The students are asked to write an essay in response to a question that asks them to state, explain, and support their opinion on an issue. An essay is generally a short piece of writing outlining the writer's perspective or story. Essay writing is the process of expressing one's thoughts, ideas, opinions, or arguments in written form (Sreena & Ilankumaran, 2018). It involves organizing, structuring, and presenting information in a clear and concise manner, with the aim of communicating a particular message or viewpoint to the reader (Walshe, 2015).The type of essays used in the present study is formal expository essays.

In the writing skill test, an effective essay will contain a minimum of (250-300) words. The writing subject is chosen in accordance with the topics they have previously covered as well as the criterion of authenticity. The total score is (20) according to scoring rubric which consists of five components of speaking: *Content, Organization, Vocabulary, Grammar, and Mechanics.* These components are leveled from one to four (poor, fair, good, excellent). Thus, the highest score a student can get is (20) while the lowest score is (4).

3.3 Psychometric Properties of the Instruments

3.3.1 The Validity

Brown & Rodgers (2002, p. 221), states that validity refers to "the degree to which a test actually measures what is intended to measure". Two type of validity has been estimated: *face validity and constructing validity,* which presented as follows:

3.3.1.1 Face validity

Face validity is defined "as the degree to which test respondents view the content of a test and its items as relevant to the context in which the test is being administered" (McNamara, 2006 ,p.133).

To ensure the face validity of the two study instruments, they have been exposed to a jury of a specialist in ELT, and applied Linguistics. The jury members are asked to decide on the appropriateness of the instruments in measuring the investigated variables. The jury includes 15 professors and assistant professors from different Iraqi universities. The jury members agree on the suitability of the instruments and the scoring scheme for achieving the study's aims, except for some linguistic modifications which are taken into consideration , before putting the final form of each instrument.

3.3.1.2 Construct Validity

Construct validity an instrument can be evaluated by checking the patterns of correlations within the scores achieved by subjects responding to the instrument items. This can be achieved through statistical analysis of the instrument items (Trochim et al., 2015). To ensure the construct validity of the two instruments, they have been verified through finding out the item's discrimination power; the correlation coefficient between item score and the total score of each scale; the correlation of items with the component they belong to the score of each component to which the item belongs.

Also, the correlation coefficient of each component has been calculated with the total scores of the scale; Matrix correlation coefficients; and item difficulty level. These methods can help to identify patterns, trends, and relationships in the data, and to test whether these findings are statistically significant. Results show that all the correlational coefficients are statistically significant and this indicates that the three instruments of the study are valid.

3.3.2 Pilot Administration

A pilot study is a method by which a research instrument is introduced to a small population sample before its final administration (Mohamad et al., 2015). In conducting any analysis, it is a fundamental step. This administration has been conducted in order to:

1. Check the clarity of the instructions of the instrument, and
2. Estimate the time allotted for answering the questionnaire or test.

The two instruments have been conducted on a sample of 50 students (not included in the main sample) from the Department of English of /College of Education- Ibn Rushed for Human Sciences is selected to conduct the pilot administration of the research instrument. The pilot study is carried out on 19th, 20th, of February, 2023.

Consequently, the application of the pilot study shows no serious ambiguity concerning answering the instruments. The time required to answer the MRQ is found to range between (15-25) minutes. The time required for WPT is (35) minutes, the whole lesson which is (50) minutes.

3.3.3 Item Analysis

According to the aims of the study, the statistical methods by SPSS are employed to analyze the research findings of this study.

3.3.3.1 Item Discrimination Power

Discrimination power measures how well each item on the instrument is able to differentiate between individuals who have high versus low levels of the trait or attribute being measured (Mbewa, 2017).

The questionnaire is applied to the sample members of (360) students. To extract the discriminatory power of the questionnaire's items, the scores of the sample members are arranged from the highest total degree to the lowest total degree. The two extreme groups are determined by the total score and by (27%) for each group which represents the best percentage that can be adopted, because it presents two groups with the maximum possible size and differentiation. As well as, Trochim et al., (2015) suggested that the number of members of each of the two extreme groups in the total score when calculating the discriminatory power of the items is (27%) of the sample members. The number of individuals in each group is (97) students in the upper group and (97) students in the lower group. So, the number of individuals in the upper and lower groups was (194) male and female students.

As for MRQ, the t-test was used for two independent samples in calculating the significance of the differences between the mean of the two groups in the scores of each item of the questionnaire and on the basis that the calculated t- test value

represents the discriminatory power of the items (Karim, 2021). Through this procedure, it is found that all items are valid and distinct because their calculated t-test value is greater than the critical t-value (1.96) with a degree of freedom (192) and at a significance level (0.05). Table (3.2) shows the results of calculating the discriminative power of the items in MRQ.

Table 3.2 *Items Discrimination Power of MRQ*

Items no.	Higher group		Lower group		Calculated T-value	Level of Significance at level (0.05)
	Mean	SD	Mean	SD		
1	4.000	0.791	2.402	0.920	13.170	Significant
2	4.082	0.838	2.629	0.601	14.103	Significant
3	4.082	0.997	2.660	0.853	10.848	Significant
4	3.959	0.789	2.670	1.115	9.430	Significant
5	4.175	0.804	2.351	0.751	16.593	Significant
6	3.784	0.892	2.577	0.852	9.777	Significant
7	4.000	0.777	2.567	0.762	13.161	Significant
8	3.526	0.830	2.619	1.103	6.826	Significant
9	3.732	0.884	2.722	1.038	7.526	Significant
10	3.794	0.776	2.649	0.778	10.412	Significant
11	3.784	0.844	2.567	0.956	9.535	Significant
12	3.773	0.823	2.804	0.897	7.960	Significant
13	3.866	0.656	3.330	0.886	4.862	Significant
14	3.557	1.020	2.876	0.807	5.230	Significant
15	3.918	0.920	3.216	0.992	5.180	Significant
16	4.103	0.835	2.897	0.729	10.882	Significant
17	3.918	0.920	3.021	1.020	6.527	Significant
18	3.845	0.833	2.876	0.982	7.525	Significant
19	4.010	0.848	2.485	0.925	12.157	Significant
20	3.732	0.810	2.639	0.991	8.534	Significant
21	3.887	0.877	2.588	0.910	10.281	Significant
22	3.763	0.933	2.526	0.902	9.531	Significant
23	3.925	0.890	3.567	1.009	2.658	Significant
24	3.608	1.026	3.113	0.705	3.974	Significant
25	4.000	0.816	3.660	0.956	2.706	Significant

26	4.031	0.809	3.567	0.978	3.654	Significant
27	4.072	0.869	3.278	0.826	6.621	Significant
28	3.959	0.789	3.371	0.993	4.632	Significant
29	4.052	0.782	3.371	0.939	5.568	Significant
30	4.351	0.751	3.000	0.791	12.389	Significant
31	4.278	0.851	3.186	0.870	8.981	Significant
32	4.093	0.751	2.938	0.827	10.336	Significant
33	4.021	0.878	2.866	0.909	9.140	Significant
34	4.155	0.821	3.010	0.919	9.290	Significant
35	4.330	0.688	3.031	0.962	10.980	Significant

The results suggest that the discrimination power values for WPT fall within the range of 0.369 to 0.397, as presented in Table 3.3 for writing skills. These results indicate that all the items demonstrate high discrimination powers. It is worth mentioning that specialists consider an item to have an acceptable discrimination power if it is 0.20 or higher (Nuanaly, 1970; Ebel & Frisbie, 1991).

3.3.3.2 Item Difficulty Level

Item difficulty refers to the level of ease or difficulty of an item for a group of students. It is crucial to strike a balance in test difficulty. If a test is too easy, it may fail to effectively distinguish between high-achieving and low-achieving test-takers. Conversely, if the test is excessively difficult, it may not yield a reliable measure of ability (Mesic, 2011). Finding the right level of difficulty ensures the test accurately assesses the abilities of students.

In WPT, the difficulty formula for subjective questions is utilized to determine the difficulty level of the scoring components. The findings reveal that the difficulty level ranges from 0.381 to 0.433, indicating that all of the test items are within an acceptable and applicable range. According to Khoshaim and Rashid (2016, p.12), test items are considered acceptable if their difficulty level falls between 0.20 and 0.80. For further details, please refer to Table 3-3 writing test.

Table 3.3 *Difficulty Level and Discriminatory Power of Writing Skills Test*

Rubric	Writing skills								Ease coefficient	Difficulty Coefficient	Discrimination Power
	Correct Responses of High Group				Correct Responses of Low Group						
	1	2	3	4	1	2	3	4			
Content	5	13	39	40	54	27	7	9	0.610	0.390	0.369
Organization	4	14	31	48	53	30	6	8	0.619	0.381	0.397
Vocabulary	6	17	28	46	48	41	8	0	0.595	0.405	0.397
Grammar	3	20	31	43	49	35	10	3	0.604	0.396	0.379
Mechanics	8	21	30	38	53	39	3	2	0.567	0.433	0.371

3.3.4 Reliability of Instrument

Next to validity, *reliability* is another important characteristic of evaluating results. In quantitative research, reliability refers to the consistency, stability, and repetition of results; that is, a researcher's results are regarded trustworthy if similar outcomes have been obtained in identical but different circumstances (Daniel & Frederick ,2018).

In the current study, two methods, namely Test-Retest and Cronbach's alpha, were used to estimate the reliability of the research instrument. Test-Retest involves administering the same instrument to the same group of participants on two separate occasions, as outlined by Ustun et al. (2023). This method helps assess the stability and consistency of the instrument over time. On the other hand, Cronbach's alpha is employed to evaluate the internal consistency reliability of a measurement instrument, especially when it consists of multiple items or questions designed to measure the same underlying construct. This method is discussed by Heale and Twycross (2015) and Quintão et al. (2020). Thus, the stability coefficient value for writing skill is shown in the Table (3.4), these results are considered consistent and reliable.

Table 3.4 *Test-Retest and Cronbach Alpha coefficient for MRQ and WPT*

Instrument	Test-retest	Cronbach's alpha
MRQ	0.92	0.89
Writing	----------	0.88

To calculate the reliability by using test-retest method, the two questioners are applied on a pilot sample of (40) 3rd year students , with a time interval of (14) days from the first application, then the Pearson correlation coefficient is calculated to

the correlation. According to Table (3.4) ,the value is acceptable and has a very good stability coefficient. The test reliability is acceptable if it is not less than (0.5) and very good if it is more than (0.8) (Messick, 1995; Zohrabi, 2013).

4. Presentation and Discussion of Results

To determine the level of Iraqi EFL university students in MR and their performance in writing skills, arithmetic means and standard deviation were computed. The researchers conducted a t-test on a single sample in order to assess the difference between the arithmetic and theoretical means. The results indicate that the sample arithmetic mean is (119.681) with a standard deviation of (13.792). To find out the significance difference between the arithmetic mean and theoretical one which is (105), one independent sample t-test is used revealing the results shown in Table (4.1) and Figure (4.1). The computed t-test value (20.195) is found to be higher than the critical t- test value (1.96). The results demonstrate that there is a statistically significant difference at (0.05) level of significance and under (359) degree of freedom, which means that Iraqi EFL university students have a good level of metacognitive regulation.

Table 4.1 *The Mean, Standard Deviation, and T- Test Value for the Metacognitive Regulation Questionnaire*

Variable	Sample	Arithmetic Average	Standard Deviation	Theoretical Mean	T-Value		Significance (0.05)
					Computed	Critical	
Metacognitive Regulation	360	119.681	13.792	105	20.195	1.960	Significant

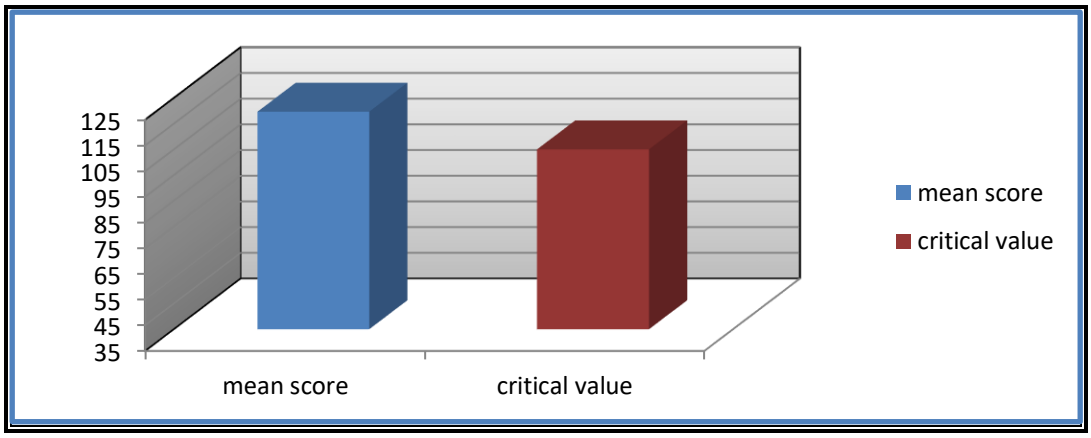

Figure 4.1 *Computed and Theoretical Mean for MRQ*

Also, the arithmetic mean and standard deviation are extracted for each domain of metacognitive regulation, to determent the significance of the difference between the arithmetic mean and the theoretical mean for each domain, one independent sample t-test is used, and the results are shown in the Table (4.2) and Figure (4.2).

Table 4.2 *The Mean, Standard Deviation, and T-test Value for Domains of the Metacognitive Regulation Questionnaire*

Domains of MRQ	Sample	Arithmetic Average	Standard Deviation	Theoretical Mean	T-Value		Significance (0.05)
					Computed	Critical	
Planning	360	22.567	4.168	21	7.131	1.96	Significant
Monitoring	360	27.761	7.677	66	22.917	1.96	Significant
Evaluation	360	21.843	3.078	18	23.723	1.96	Significant

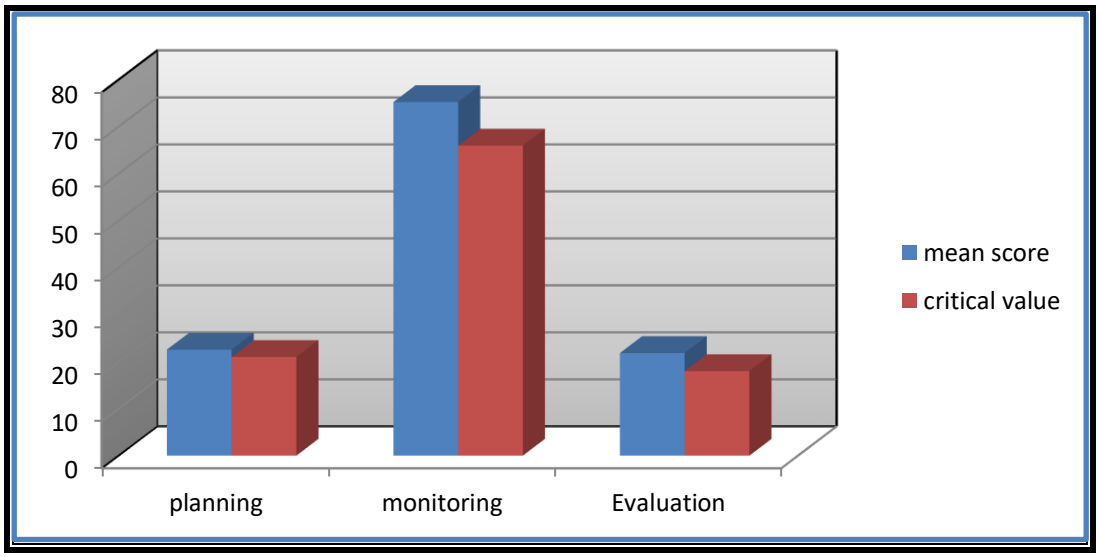

Figure 4.2 *Computed and Theoretical Mean of Domains of MRQ*

According to the Table (4.2) and Figure (4.2) above, the results can be summarized as follows:

1. **For the domain of planning**, the arithmetic mean of the sample is (22.567), the standard deviation is (4.168), the theoretical mean is (21), and the computed t- test value is (7.131), which is higher than the critical value

of (1.96) at the level of significance (0.05) and the degree of Freedom (359). This indicates that the research sample has a good level of planning.

2. **For the domain of monitoring**, the arithmetic mean of the sample is (75.272), the standard deviation is (7.677), the theoretical mean is (66).The computed t- test value is (22.916) , which shows that it is higher than the critical value (1.96) at the level of significance (0. 05) and a degree of freedom (359). This illustrates that the research sample has a good level of monitoring.
3. **For the domain of evaluation**, the arithmetic mean of the sample is found to be (21.842), the standard deviation is (3.067), the theoretical mean is (18), and the calculated t-test value is (23.762),is found to be higher than the critical value (1.96) at the level of significance (0. 05) and a degree of freedom (359). This is reveals that the research sample has a good level of evaluation.

To achieve the second aim, Pearson correlation coefficients and t-tests for the significance of correlation have been employed to identify the correlation between MR and WPT. The results are illustrated in Tables (4.4).

Table 4.6 *The Correlation Between MR and WPT*

Productive skills	Sample	Pearson Correlation Coefficients For MR	T-Value		Significance (0.05)
			Computed	Critical	
Writing	360	0.452	10.044	1.96	Significant

According to the Table above, the correlation coefficient between metacognitive regulation and writing skill is (0.452), and to find out the significance of the relationship, a t-test is used. The results show that the computed t- value is (10.044) which is higher than the critical t-value (1.96) at a level of significant (0.05) and the degree of freedom (358) . This result means that the correlation between metacognitive regulation and writing skill is statistically a significant positive correlation; that is, the higher level of the metacognitive regulation of Iraqi university students, the better their writing skill.

5. Conclusions

1. Iraqi EFL university students have a good level of metacognitive regulation.
2. Iraqi EFL university students' writing skills performance is at a good level.
3. Iraqi EFL university students' MR are statistically correlated with their writing skills, which indicate that MR are positively employed by students.

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