الذكوات البيض

اسم مشتق من الذكوة وهي الجمرة الملتهبة والمراد
بالذكوات الربوات البيض الصغيرة المحيطة بمقام أمير
المؤمنين علي بن أبي طالب{عليه السلام}
شبهها لضيائها وتوهجها عند شروق الشمس عليها لما فيها
موضع قبر علي بن أبي طالب {عليه السلام}
من الدراري المضيئة
{در النجف}فكأنها جمرات ملتهبة وهي المرتفع من الأرض،
وهي ثلاثة مرتفعات صغيرة نتوءات بارزة في أرض الغري وقد
سميت الغري باسمها، وكلمة بيض لبروزهاعن الأرض.وفي رواية
إنّها موضع خلوته أو إنّها موضع عبادته وفي رواية أخرى
في رواية المفضل عن الإمام الصادق {عليه السلام}قال:
قلت:يا سيدي فأين يكون دار المهدي ومجمع المؤمنين؟
قال:يكون ملكه بالكوفة، ومجلس حكمه جامعها
وبيت ماله ومقسم غنائم المسلمين مسجد
السهلة وموضع خلوته الذكوات البيض

Republic of Iraq
Ministry of Higher Education & Scientific Research
Research & Development Department

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
دائرة البحث والتطوير

No.:
Date:

الرقم: ب ت ع/ ٥٠٤٩
التاريخ: ١٤/٨/٢٠٢٢

ديوان الوقف الشيعي / دائرة البحوث والدراسات

م/ مجلة الذكوات البيض

السلام عليكم ورحمة الله وبركاته ...

إشارة الى كتابكم المرقم ١٠٤٦ والمؤرخ ١٢/٢٨ /٢٠٢١ والحاقاً بكتابنا المرقم ب ت ٥٧٤٤/٤ في ٢٠٢١/٩/٦ ، والمتضمن أستحداث مجلتكم التي تصدر عن الوقف المذكورة أعلاه ، وبعد الحصول على الرقم المعياري الدولي المطبوع وانشاء موقع الكتروني للمجلة تعتبر الموافقة الواردة في كتابنا أعلاه موافقة نهائية على أستحداث المجلة.

... مع وافر التقدير

أ.م.د حسين صالح حسن
المدير العام لدائرة البحث والتطوير / وكالة
٢٠٢٢/١/١٢

نسخة منه الى:
- قسم الشؤون العلمية / شعبة التأليف والنشر والترجمة / مع الأوراق.
- الصادرة.

مهند ابراهيم
١٠ / تشرين الثاني

إشارة إلى كتاب وزارة التعليم العالي والبحث العلمي / دائرة البحث والتطوير
المرقم ٥٠٤٩ في ٢٠٢٢/٨/١٤ المعطوف على إعمامهم
المرقم ١٨٨٧ في ٢٠١٧/٣/٦
تُعدّ مجلة الذكوات البيض مجلة علمية رصينة ومعتمدة للترقيات العلمية.

الذكوات البيض

مجلة علمية فكرية فصلية محكمة تصدر عن
دائرة البحوث والدراسات في ديوان الوقف الشيعي

العدد (١٥) السنة الثالثة ذي الحجة ١٤٤٦ هـ حزيران ٢٠٢٥ م
رقم الإيداع في دار الكتب والو ثائق (١١٢٥)
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العدد (١٥) السنة الثالثة ذي الحجة ١٤٤٦ هـ – حزيران ٢٠٢٥ م

الذكوات البيض

مجلة علمية فكرية فصلية محكمة تصدر عن
دائرة البحوث والدراسات في ديوان الوقف الشيعي

العدد (١٥) السنة الثالثة ذي الحجة ١٤٤٦ هـ – حزيران ٢٠٢٥ م

العنوان الموقعي
مجلة الذكوات البيض
جمهورية العراق
بغداد /باب المعظم
مقابل وزارة الصحة
دائرة البحوث والدراسات
الاتصالات
مدير التحرير
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دليل المؤلف .....

١–أن يتسم البحث بالأصالة والجدّة والقيمة العلمية والمعرفية الكبيرة وسلامة اللغة ودقة التوثيق.

٢– أن تحتوي الصفحة الأولى من البحث على:

أ. عنوان البحث باللغة العربية .

ب . اسم الباحث باللغة العربي، ودرجته العلمية وشهادته.

ت . بريد الباحث الإلكتروني.

ث . ملخصان: أحدهما باللغةِ العربية والآخر باللغةِ الإنكليزية.

ج . تدرج مفاتيح الكلمات باللغة العربية بعد الملخص العربي.

٣–أن يكونَ مطبوعًا على الحاسوب بنظام(office Word) ٢٠٠٧ أو ٢٠١٠) وعلى قرص ليزري مدمج (CD) على شكل ملف واحد فقط (أي لا يُجزَّأ البحث بأكثر من ملف على القرص) وتُزوَّد هيأة التحرير بثلاث نسخ ورقية وتوضع الرسوم أو الأشكال، إنْ وُجدت، في مكانِها منَ البحثِ، على أن تكونَ صالحةً مِنَ الناحيةِ الفنيَّة للطباعة.

٤–أن لا يزيدَ عدد صفحات البحث على (٢٥) خمس وعشرين صفحة من الحجم (A4).

٥. يلتزم الباحث في ترتيب وتنسيق المصادر على الصيغة APA

٦–أن يلتزم الباحث بدفعِ أُجور النشر المحدَّدة البالغة (٧٥،٠٠٠) خمسة وسبعين ألف دينار عراقي، أو ما يعادلها بالعملات الأجنبية.

٧–أن يكونَ البحثُ خاليًا مِنَ الأخطاءِ اللغوية والنحوية والإملائيَّة.

٨–أن يلتزم الباحث بالخطوط وأحجامِها على النحو الآتي:

أ. اللغة العربية: نوع الخط (Arabic Simplified) وحجم الخط (١٤) للمتن.

ب . اللغة الإنكليزية: نوع الخط (Times New Roman) عناوين البحث (١٦). والملخصات (١٢)

أما فقرات البحث الأخرى؛ فبحجم (١٤) .

٩–أن تكونَ هوامش البحثِ بالنظام الأكتروني(تعليقات ختامية) في نهاية البحث. بحجم ١٢.

١٠–تكون مسافة الحواشي الجانبية (٢،٥٤) سم،والمسافة بين الأسطر (١) .

١١–في حال استعمال برنامج مصحف المدينة للآيات القرآنية يتحمل الباحث ظهور هذه الآيات المباركة بالشكل الصحيح من عدمه، لذا يفضّل النسخ من المصحف الالكتروني المتوافر على شبكة الانترنيت.

١٢–يبلَّغ الباحث بقرارِ صلاحيَّة النشر أو عدمها في مدَّةٍ لا تتجاوز شهرين من تاريخ وصولِهِ إلى هيأةِ التحرير.

١٣–يلتزمُ الباحث بإجراءِ تعديلات المحكّمين على بحثِهِ وفق التقارير المرسلة إليهِ وموافاةِ المجلة بنسخةٍ مُعدَّلةٍ في مدَّةٍ لا تتجاوزُ (١٥) خمسة عشر يومًا.

١٤–لا يحق للباحث المطالبة بمتطلبات البحث كافة بعد مرور سنة من تاريخ النشر.

١٥–لاتعاد البحوث الى أصحابها سواء قُبلت أم لم تُقبل.

١٦–تكون مصادر البحث وهوامشه في نهاية البحث، مع كتابة معلومات المصدر عندما يرد لأول مرة.

١٧–يخضع البحث للتقويم السري من ثلاثة خبراء لبيان صلاحيته للنشر.

١٨–يشترط على طلبة الدراسات العليا فصلاً عن الشروط السابقة جلب ما يثبت موافقة الأستاذ المشرف على البحث وفق النموذج المعتمد في المجلة.

١٩–يحصل الباحث على مستل واحد لبحثه، ونسخة من المجلة، واذا رغب في الحصول على نسخة أخرى فعليه شراؤها بسعر (١٥) ألف دينار.

٢٠–تعبر الأبحاث المنشورة في المجلة عن آراء أصحابها لا عن رأي المجلة.

٢١–ترسل البحوث إلى مقر المجلة – دائرة البحوث والدراسات في ديوان الوقف الشيعي بغداد – باب المعظم)

أو البريد الإلكتروني:(hus65in@Gmail.com) (offreserch@sed.gov.iq) بعد دفع الأجور في مقر المجلة

٢٢–لا تلتزمُ المجلة بنشر البحوث التي تُخلُّ بشرطٍ من هذهِ الشروط .

مجلة علمية فكرية فصلية محكمة تصدر عن
دائرة البحوث والدراسات في ديوان الوقف الشيعي

محتوى العدد (١٥) المجلد التاسع

The Correlation Between Iraqi EFL University Students' Brain Dominance and Performance in Speaking Skills

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Abstract:

Successful FL learners strive to mitigate and reduce the linguistic difficulties and shortcomings encountered during their communication to enhance linguistic engagement. Consequently, the examination of the correlation between brain hemisphere dominance and FL learning becomes a subject of great significance. This study was conducted to find out the correlation between Iraqi EFL university students' brain hemisphere dominance and their performance in speaking skill. The research followed a correlational study design and included a sample of 300 third-year students from the colleges of education in the three universities of Maysan University, Baghdad University, and Mosul University for the academic year 2024/2025. The study employed two instruments to achieve its aims, these instruments consisted of the brain dominance inventory designed by Davis et al. (1994) and the speaking skills test. The findings revealed no significant correlation between right hemisphere dominance and speaking skill; nevertheless, left and whole dominance were strongly associated with enhanced speaking performance.

Keywords: brain hemisphere dominance, speaking skill, Iraqi EFL students.

المستخلص:

تُعدّ هيمنة نصفَي الدماغ موضوعًا ذا أهمية بالغة في العديد من الميادين التربوية، ولا سيما في ميدان تعلّم اللغات الأجنبية والثانية. وقد أفضى تحديد الوظائف المتخصصة لكل من النصف الأيسر والأيمن للدماغ إلى إغناء الفهم العلمي للسلوك الإنساني، موضحًا أن لكل نصف دماغي دورًا متميزًا في أداء المهام المعرفية المختلفة. وعليه، تهدف هذه الدراسة إلى استقصاء العلاقة بين هيمنة نصفَي الدماغ لدى طلبة الجامعات العراقية الدارسين للغة الإنجليزية لغةً أجنبية، وأدائهم في مهارة التحدث. اعتمدت الدراسة المنهج الوصفي الارتباطي، مستندةً إلى عينة قوامها ٣٠٠ طالب وطالبة من المرحلة الثالثة في كليات التربية بجامعات ميسان وبغداد والموصل، وقد جرى اختيارهم بطريقة عشوائية خلال العام الدراسي ٢٠٢٤/٢٠٢٥. ولتحقيق أهداف الدراسة، طُبقت أداتان بحثيتان؛ تمثلت الأولى في استبيان لقياس هيمنة نصفَي الدماغ، بينما تمثلت الثانية في اختبار مهارة التحدث. وقد أسفرت النتائج عن وجود فروق ذات دلالة إحصائية في هيمنة نصفَي الدماغ بين الطلبة المشاركين. كما أظهرت النتائج، فيما يتعلق بالهدف الثاني، أن مستوى أداء الطلبة في مهارة التحدث كان متوسطًا. أما تحليل معاملات الارتباط، فقد بيّن عدم وجود علاقة دالة بين هيمنة النصف الأيمن من الدماغ ومهارة التحدث؛ بينما بينت

النتائج ان الهيمنة اليسرى والهيمنة الكلية ارتبطتا ارتباطًا قويًا بتحسن الأداء في هذه المهارة. وفيما يتصل بنسبة الإسهام، كشفت النتائج أن هيمنة النصف الأيسر اسهمت بنسبة ١٧٪ في مهارة التحدث، وأسهمت الهيمنة الكلية/الثنائية بنسبة ٢٦٪ في هذه المهارة ذاتها. وفي الختام، عُرضت الاستنتاجات المستخلصة، والتوصيات العلمية، والمقترحات التي يمكن أن توجه الدراسات المستقبلية في هذا الميدان.

الكلمات المفتاحية: سيطرة نصفي الدماغ، مهارة التحدث، الطلبة العراقيون الدارسون للغة الإنجليزية كلغة أجنبية.

1.Introduction

Bhatti (2021) explained that speaking was an essential skill for FL learners, as it enabled them to interact effectively. The limited time available for both speakers and listeners to interpret spoken discourse or formulate responses was constrained by the transient nature of its reception and production. Spoken discourse typically occurred in a linear, face-to-face context and was characterized by its fleeting nature, unpredictability, and variability. These features were further reinforced by nonverbal cues, such as gestures and facial expressions. According to such studies, despite their potential and engagement with FL education, numerous studies have indicated that Iraqi EFL students often underperform in speaking skill. For instance, Sultan and Aziz (2021) observed that even graduate students majoring in English displayed limited speaking proficiency, with classroom participation often restricted to a small number of proficient students. Understanding the intricate relationship between the brain and language is fundamental to comprehending students' linguistic performance, especially regarding productive skills. Neurobiological research suggests that the human brain exhibits specialized anatomical and functional structures that facilitate language learning and use. Prominently, Wernicke's area and Broca's area, situated in the left hemisphere, play crucial roles in speech production and comprehension, respectively. Together with a broader neural network spanning both hemispheres, these regions constituted the neurological foundation for language processing (Kumar, Das, & Bhattacharya, 2019). The study aimed to identify the following: 1. The level of BHD among Iraqi EFL University Students. 2. The level of performance in speaking skill among Iraqi EFL University Students. 3. The statistical signifi-

cance of the correlation between BHD and the level of performance in speaking skill among Iraqi EFL university students. 4. The contribution of BHD to performance in speaking skill. The present study tries to answer the following questions: 1. What is the level of BHD of Iraqi EFL university students? 2. What is the performance level of Iraqi EFL university students in speaking skill? 3. Is there a correlation between BHD and students' speaking skill? 4. How much does BHD lead to better achievement in speaking skill among Iraqi EFL university students?

2. Theoretical Framework

2.1 Brain Hemisphere Dominance

Weisi and Khaksar (2015) stated that the brain, located beneath the skull, comprises around 10 billion neurons and billions of fibres that interconnect these neurons. It was accurate to state that the brain was among the human body's most intricate organs. The corpus callosum, a thick cellular layer, connects the left and right cerebral hemispheres, constituting the intricate organ of the human brain. Then, the brain is responsible for learning, movement, behaviour, intellect, and senses (Caine & Caine, 1990).

In the realm of psychology, the brain and individual behaviours are crucial for attaining educational goals. A prominent theory in neurology associated with educational and study strategies is brain dominance (Kök, 2014). This concept entailed the categorization of human cognition into hemispheres according to individual inclinations and cognitive styles. It was determined that each individual varied in their ability to do various activities (Seneviratne et al., 2019).

The concept of right-brain and left-brain thinking was validated by studies conducted by American Nobel Laureate Roger Wolcott Sperry (LoCicero et al., 2005). In 1946, Sperry revealed that the functional mechanism of the corpus callosum and the notion of a split brain underscored the significance of connecting the two hemispheres of the brain, with the regions responsible for comprehension and speech production situated in the left hemisphere (Voneida, 1997).

2.1.1 Language and the Brain: Localization and Lateralization

Neurolinguistics is the science of exploring the connection between language and brain function. It combines information about the brain's structure and function with ideas about how language is put together and used (Ahlsén, 2006). The term "neurolinguistics" is new, but the practice of studying how the brain affects language began in the 19th century. This started with Phineas Gage in 1848, who could still speak despite damaging his frontal lobe. His case gave early ideas of where language function is located in the brain (Yule, 2010).

Several different theories have been offered as to how language is divided up in the brain. Localization theory holds that there is discrete brain areas dedicated to different language functions. Associationist models hold that language is derived from the interaction of many interconnected areas of the brain. Dynamic localization offers the account that functional systems made up of constituent parts can evolve and change due to growth or damage. Holistic models, on the other hand, suggest that language is regulated by large networks of interconnected areas of the brain. Evolutionary theories highlight how language and brain structures develop together in different species and during a person's growth (Ahlsén, 2006).

This concurs with what Paul Broca found, that language can be both lateralized and localized. Certain functions are confined to a single hemisphere (Kolb & Whishaw, 2009). Further work from Carl Wernicke complemented this by finding Wernicke's area in the temporal lobe, which is responsible for interpreting spoken language. Language is processed through areas linking Broca's and Wernicke's areas in the arcuate fasciculus. These discoveries all feed into the idea of functional lateralization, where the left hemisphere would usually process verbal and language functions and the right hemisphere would process non-verbal and visual functions (Kimura, 1973).

2.1.2 Hemispheric Specialization and Dominance

Hemispheric specialization refers to the functional differentiation between the brain's two hemispheres, a phenomenon that

gained momentum through studies on commissurotomy (split–brain) patients conducted by the California group (Coch et al., 2007). The concept of hemisphericity was described as an individu–al's tendency to favour one hemisphere over the other in cognitive processing (Leng et al., 1998). This preference manifests in various domains of perception, learning, and information processing, typ–ically associated with either the left or right cerebral hemisphere (Bavand et al., 2013).

In sum, hemispheric dominance and specialization provide a neurological basis for understanding individual differences in learning styles, cognitive strengths, and educational perfor–mance. Recognizing these distinctions enables more effective pedagogical strategies that cater to diverse learner profiles. Ac–cording to Celik (2007), the labour distribution between LHD and RHD is shown in Table 1.

Table (1): Labour distribution between LHD and RHD

Left Hemisphere Dominance	Right Hemisphere Dominance
1.Linguistics - Verbal Communication	1.Visual Perception – Spatial Localization.
2.Verbal Sounds: lexicon, consonants	2.Non-verbal Auditory Signals: barking, whistling.
3. Analytical Processing: discerning the intricacies inside an image.	3. Holistic Processing: seeing the overarching perspective.
4. Auditory Comprehension – Textual Analysis	4. Metaphor – Verse – Wit.
5.Composition – Oration	5. Melody, Pitch, Cadence.
6. Summary Lexicon –allegiance, liberty	6. Concrete Terms – desk, jacket
7. Computation	7. Acknowledgement
8. Thinking	8. Attention, Emotion.
9. Lexical enigmas	9. Art – Colours
10.Logical: Causation and Consequence	10. Theatrical performance
11. Proficient with numerical data	11. Facial recognition
12. Factual	12. Creative.

2.2 Speaking Skills and Speaking Performance

Khansir and Zaab (2015) stated that speaking is an interactive procedure between the speaker and the listener. Chastain (1975, p. 330–358) declared, "Speaking is a productive skill and involves many components. Speaking is more than making the right sounds, choosing the right words or getting the constructions."

Learning EFL language skills played an essential part, specifically in speaking skills, as speaking illustrated an interactive procedure between the speaker and the listener to debate the ideas or components and produce personal views in accordance with facts, either transactional or interactive (Krebt, 2023).

Aristy et al (2019) asserted that to facilitate effective communication, learners have to acquire a broad array of speaking skills across four fundamental skill areas. Firstly, phonological skills are necessary as learners should be capable of blending phonemes and using correct stress and intonation patterns. Secondly, speech function competencies allow learners to carry out certain communicative functions in social and transactional contexts, including agreeing, requesting clarification, or clarifying their utterances. Third, interactional competencies are necessary for the effective management of face-to-face communication that includes such things as turn-taking, topic control, and the negotiation of meaning, in addition to the ability to initiate, sustain, and close conversations. Finally, higher discourse skills are crucial for producing long, uninterrupted speech; students must organize their language within set conventions suitable for various kinds of discourse, such as narrative, procedural, expository, and descriptive genres, to ensure clarity and coherence.

Jones et al. (2012) stated that speech as performance had a conventional structure and employed predictable vocabulary. Because of the lack of contextual assistance, language learners had to provide all relevant information (including subject relevance and textual skill) in the text. Given the importance of meaning, greater attention was given to language and accuracy.

2.2.1 The Causes of Difficulties in Speaking skill

Zhang (2009) posited that speaking represents the most difficult skill for English learners, with many factors contributing to this issue. Ur (1996) identified several characteristics that hinder speaking, including inhibition, fear of judgment, shyness, and lack of motivation. Insufficient involvement, such as large class sizes and the propensity of certain learners to monopolize dis-

cussions, may also contribute to speaking difficulties.

Rababa'h (2005) identified variables that hinder English speakin proficiency among EFL learners, including learners' languag skills, instructional methodologies, content, and the surround ing environment. Some learners lacked the necessary languag to convey their meanings, leading to inability to sustain conver sations. Motivation was also a deficiency, as learners perceive no genuine necessity to learn or communicate in English (Lit tlewood,1984).

All other disciplines were conducted in Arabic, with English re garded solely as an academic discipline, resulting in inadequat exposure to the English language. The absence of a target lan guage context may have contributed to speaking issues. "Chil dren needed both to participate in discourse and to build u knowledge and skills for participation" (Cameron, 2001, p. 36 Researchers acknowledged that learners could enhance the speaking proficiency by cultivating learning techniques tha foster autonomous learning (Nakatani,2010).

2.3 The Correlation Between Brain Hemisphere Dominanc and Speaking Skill

Speaking is a cognitively demanding and neurologically or chestrated process involving distinct brain regions, primaril within the left hemisphere. Neuroanatomical studies have lon established that Broca's area, located in the left inferior front gyrus, is crucial for speech production, while Wernicke's are in the left posterior temporal lobe, is responsible for languag comprehension (Siahaan, 2008; Grodzinsky & Amunts, 2006 Damage to these areas leads to language impairments known a aphasia, evidencing their central role in verbal communicatio The process of speaking involves a coordinated sequence of neu ral events. Communicative intent is initiated in the prefront cortex, then linguistically encoded in Broca's area, and subse quently transmitted to motor areas to control articulatory mus cles (Rouse, 2020). Additionally, paralinguistic features such a intonation, pauses, facial expressions, and gestures—which ar largely modulated by right-hemispheric regions—play an es

sential role in enhancing communicative effectiveness (Thornbury, 2005).

Brain hemisphere dominance significantly shapes speaking abilities through its influence on linguistic, executive, and emotional processing. The left hemisphere, typically dominant in right-handed individuals, governs the analytical and linguistic components of speech, including grammar, syntax, and phonological decoding (Pritchard, 2009). Conversely, the right hemispher contributes to prosodic, pragmatic, and inferential aspects of communication, such as interpreting tone, emotion, and nonliteral meanings. Hence, damage to the right hemisphere may not impair core grammar but can lead to disruptions in discourse coherence and social appropriateness, as observed in Right Hemisphere Disorder (RHD) (Rouse, 2020).

Furthermore, executive functions—such as planning, sequencing, and working memory—are tightly linked with spoken fluency and are predominantly mediated by the prefrontal cortex of the dominant hemisphere. These cognitive operations are essential for organizing speech content, maintaining conversational flow, and adapting language use to context (Riggenbach & Lazaraton, 1991; Richards & Schmidt, 2002).

Neuroscientific evidence supports the idea that language lateralization—the dominance of one hemisphere in language processing—is a defining characteristic of the human brain. According to Cai, Haegen, and Brysbaert (2013), language production is highly lateralized to the left hemisphere, while functions like spatial attention are generally governed by the right. Nevertheless, both hemispheres interact dynamically during natural speech, particularly through the corpus callosum, which facilitates inter-hemispheric communication (Emmorey, 2002). Importantly, neural plasticity enables individuals to compensate for deficits in language production through targeted interventions. Approaches such as constraint-induced language therapy, intensive repetition, and multimodal stimulation have shown promise in enhancing speech recovery or development by engaging both hemispheres and fostering new neural connections

(Rouse, 2020).

Overall, speaking skill is not merely a linguistic phe but a complex neurocognitive activity rooted in he specialization, executive control, and inter-hemisp tegration. Understanding the neurological underpi speaking provides valuable insight into how brain d may influence learners' performance in oral language

3. Methodology

3.1 Participants of the Study

Kumar (2018) defined a population as a collective of i from whom researchers gather critical data to address questions. A sample refers to any selected subset of i intended to represent the larger population. The rand ple was described as one in which every member of th tion possesses an equal and independent probability of (Richards & Schmidt, 2010). The study population c Iraqi EFL third-year university students registered i of education, excluding those from the Kurdistan are the academic year 2024/2025. The sample, however, of 300 EFL students who were selected randomly fr universities: The College of Education, Ibn Rushd fo Sciences/University of Baghdad (112 students), the C Education/University of Mosul (137 students), and th of Education/University of Maysan (51 students), as illu Table (2).

Table (2)Population and Sample of the Study

University	Population	Sample
Baghdad	219	112
Mosul	270	137
Maysan	100	51
Total	589	300

3.2 Instruments

3.2.1 Brain Dominance Inventory (BDI)

The Brain dominance instrument used in this study w ed from Davis et al (1994). The inventory consisted of including three preferences (right, left, and whole bra nance). Students were required to select one option

three provided for each item.

3.2.2 Speaking Skill Test

Fulcher (2010) stated that the predominant format for speaking examinations is the interview style, in which candidates engage in dialogue. In accordance with the suggestions of experts, two topics for the interviews were selected. These topics were selected based on the level and interest of the sample. This part of the study consisted of two phases. The first phase focused on the individual's ability to utilize social greetings and express personal information; the examiner's primary objective was to assist the students in achieving relaxation. In the second phase, students will articulate their thoughts by selecting one of two options related to ordinary everyday themes they encounter in their lives. It constitutes the fundamental component of the examination. The two tools used in this research were presented to a panel of eighteen veteran experts who have specialties in English Language Teaching, Linguistics, and Psychology and asked to judge the suitability and quality of every item in the two instruments. The expert examiners validated the applicability of the items to the specified problem and gave elaborate suggestions. The experts validated the applicability of the items to the respective topic and sample. For the instruments applied in the present study, an overall approval rate of 100% was achieved, with the experts not having any comments, suggestions, or problems with the instruments. The reliability of the current study instrument was calculated using these techniques: The Test-Retest Method and Cronbach's Alpha Formula for brain hemisphere dominance and inter-rater reliability for speaking skill. The researchers used the Pearson's correlation coefficient between test-retest scores of the first and second tests, conducted two weeks apart. The results indicated that there was high reliability, and this meant that the instrument continued to measure BHD over time. The most reliable coefficient was recorded for left hemisphere dominance at a level of 0.855, followed by right hemisphere dominance at a level of 0.831, with whole hemisphere dominance at 0.830. These coefficients were all within

the acceptable statistical limits for reliability and indicated a very high reliability level of the measurement instrument utilized.

Cronbach's Alpha has been widely accepted as a measure to estimate the internal consistency of a test (Franzen, 2002). Most of the procedures of internal consistency estimation treated all items as single measures, conceptualizing the test as a sequence of repeated measures (Ravid, 2020). The Cronbach Alpha coefficient showed a range between 0.00 and 1.00, indicating a range between poor and good internal consistency. An alpha coefficient of (0.65) to (0.80) is generally acceptable for human factors instruments(Vaske, Kneeshaw, Bright, & Absher, 2016). The internal consistency coefficients of the brain dominance inventory, which were calculated using Cronbach's Alpha formula, revealed that all the values were within the statistically acceptable range (0.65–0.80), which indicated a very high degree of internal consistency for the measure tool. The highest Cronbach's alpha value was found for left hemisphere dominance at 0.862, followed by right hemisphere dominance at 0.826, and whole-brain dominance at 0.819. The findings revealed that the inventory used in the study exhibited high internal validity and was found to be reliably usable for measuring brain hemisphere dominance among students.

The reliability of the productive skills assessments was confirmed by inter-rater reliability. The researcher randomly selected replies from a sample of 30 students and re-evaluated their answers according to the defined scoring criteria by a secondary rater (Brown, 2007). The Pearson correlation coefficient for the two score sets was computed, resulting in a value of 0.893, indicative of a high degree of reliability (Fraenkel & Wallen, 2009).

3.5 Final Application

According to Anastasi (1988), the statistical analysis of test items was regarded as a fundamental component of test construction, and reliance on items with robust psychometric properties enhanced the test's reliability and validity. Prioritizing the statistical analysis of items, aimed at assessing their discriminatory power and validity coefficients, was deemed essential, as

logical analysis alone could not reliably or consistently represent their validity or reliability. The statistical analysis illustrated the accuracy of the items in evaluating their designated measurements (Ebel, 1972). In this study, the statistical analysis included the items' discrimination power and the correlation of the item score with the total score for right, left, and whole hemispheres of the brain. On the other hand, the statistical analysis of the speaking skill test included the difficulty and discrimination indices of the speaking skill test.

4. Results & Discussions.

– Iraqi EFL university students' level of BHD.

To achieve this aim, the Chi-square (χ^2) test was utilized to assess whether the statistical differences among the three identified hemispheres of brain dominance were statistically significant. Table 3 illustrates the results.

Table (3)

Chi-square ($\chi 2$) test results to determine the significance of statistical differences between the three hemispheres of brain dominance

Variable	Hemisphere			Chi ($\chi 2$) value		Degree of freedom	Level of significance	Statistical significance
	Right	Left	Whole	Calculated	Tabular			
Brain Dominance	92	162	46	68.24	5.99	2	0.05	Sign.

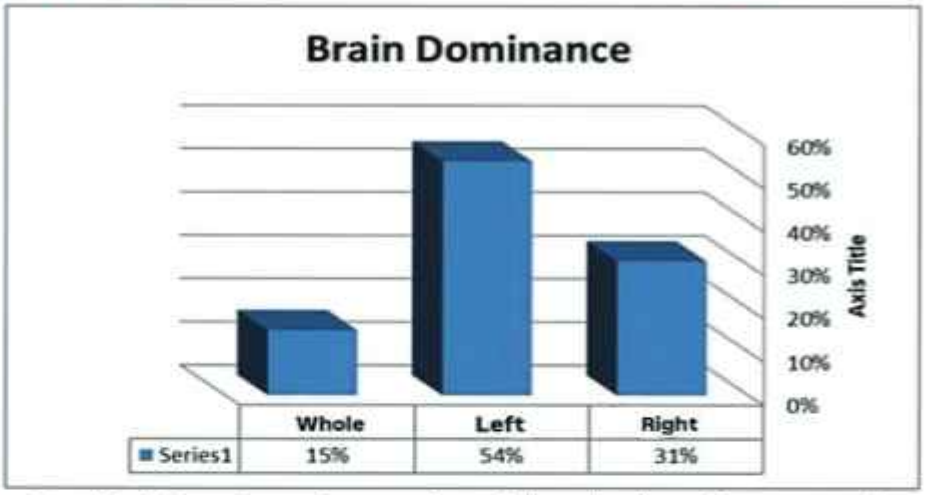
The results demonstrated the students' distribution according to their brain dominance as follows: 92 students exhibited RHD, 162 students exhibited LHD, and 46 students exhibited WHD. The computed value of the Chi-square test was (68.24), whereas the tabulated value at a degree of freedom (2) and a significance level of (0.05) was (5.99). By comparing the computed value (68.24) to the critical value (5.99), it became evident that the computed value was substantially higher.

Therefore, these findings suggest that the BHD among Iraqi EFL university students is not equally distributed across the three identified hemispheres. Furthermore, the results indicated statistically significant differences among the three hemispheres of brain dominance, with the hemispheres organized based on

their dominance levels (left, right, whole), as illustrated in Figure 1.

Figure (4.1)

Frequency Distribution of Students According to BHD



– Iraqi EFL university students' level of performance in speaking skill.

For this purpose, the study employed the one-sample t-test to establish if the participants' mean scores for speaking skill differed statistically significantly from the theoretical mean value established for the respective test. As the results presented in Table 4.

Table (4)

Results of the one-sample t-test to determine the level of performance in speaking skill among Iraqi EFL university students.

No.	*Mean*	*Std. Deviation*	*hypothetical mean*	*t-test value*		*Sign. Level 0.05*
				Computed	*Tabulate*	
٣٠٠	12.700	3.135	12.5	1.105	1.960	Not Sign.

The findings revealed that the calculated t-value for the students' speaking skills performance was less than the critical (tabulated) t-value at a 0.05 significance level with 299 degrees of freedom. The finding indicated that there was no statistically significant

difference between the sample mean and the theoretical mean of the test. Hence, this result indicates that Iraqi EFL university students had a medium level of performance in speaking skills.

- Identify the statistical significance of the correlation between BHD and the level of performance in speaking skill among Iraqi EFL university students.

Pearson's correlation coefficient was employed to assess the association between the study variables, while the t-test was implemented to determine the significance of the computed correlation coefficient values. The results were presented in Table 5.

Table (5)

The results of the t-test were used to identify the statistical significance of the calculated correlation coefficient values between brain dominance and the level of performance in speaking skill.

Hemisphere	NO.	Correlation Coefficient	t-value		Sign Level 0.05
			Computed	Tabulate	
Right	92	0.114	1.096	1.980	Not Sign.
Left	162	0.436	6.140	1.960	Sign.
Whole	46	0.374	2.690	2.021	Sign.

The results showed that learners with RHD (n = 92) recorded a weak correlation coefficient (0.114), with a calculated t-value of 1.096, which was below the tabulated value (1.980), reflecting no statistical significance. Hence, the correlation coefficient computed between RHD and speaking skill was not statistically significant at the 0.05 level, which showed a very weak relationship according to statistical standards, falling below 0.19. This result reflected the weak degree of correlation between RHD and speaking performance. In contrast, learners with LHD (n = 162) achieved a relatively high correlation coefficient (0.436), with a calculated t-value of 6.140, which substantially exceeded the tabulated value (1.960), confirming a statistically significant relationship between LHD and speaking performance. Hence, the correlation coefficient computed between the LHD and speaking skill at the 0.05 significance level was statistically significant,

which indicated a medium to strong relationship (ranging between 0.40 and 0.59). This degree suggested that LHD is noticeably correlated with higher performance in speaking skills among students, highlighting the LHD role in verbal and analytic language processing. Moreover, the results for the WHD group (n = 46) supported this finding, with a correlation coefficient of 0.374 and a calculated t-value of 2.690, exceeding the tabulated value (2.021). Hence, the correlation coefficient computed between WHD and speaking skill at the 0.05 significance level was statistically significant, which indicated a weak to medium relationship, as it falls between 0.20 and 0.39.

– Identify the contribution of brain hemisphere dominance to performance in speaking skill, the researcher adhered to the following procedures to validate this aim:

1. Right Hemisphere: Multiple regression analysis was employed to ascertain the association among these variables. The findings demonstrated that the multiple correlation coefficient among the variables was 0.382, the square of the correlation coefficient was 0.146, and the adjusted coefficient of determination was 0.127, while the standard error was 2.517, as demonstrated in Table 6.

Table (6)

Correlation coefficient value between the variables of RHD and speaking skill.

Variables	R	R square	Adjusted R Square	Std. Error Estimate
Right hemisphere	0.382	0.146	0.127	2.517

The table indicated that the multiple correlation coefficient between the predictor variable (RHD) and the predicted variable (speaking skill) was 0.382, which was statistically relevant to the critical correlation coefficient value of 0.208 at a significance level of 0.05 and 91 degrees of freedom. Additionally, the adjusted coefficient of determination was 0.127, signifying that approximately 13% of the variance in speaking skill was attributable to RHD. To ascertain the importance of RHD in speaking skill, a multiple regression analysis of variance was conducted, as shown in Table 7.

Table (7)

Results of multiple regression analysis of variance to determine

the extent to which RHD contributes to speaking skill.

SV	Square mean	Degree of freedom	S.S	f-value		Sign Level 0.05
				Computed	Tabulated	
Regression	96.179	2	48.089	7.589	4.786	Sign.
Residual	563.941	89	6.336			
Total	660.120	91	----			

The table indicated that the RHD variable largely contributed to speaking skill as the calculated p–value for the multiple regression analysis of variance reached 7.589, which exceeded the tabular p–value (4.786) at a 0.05 significance level with 2 and 89 degrees of freedom. To ascertain the relative contribution of the RHD variable to the speaking skill variable, the values of the standard regression coefficients (Beta) corresponding to the speaking skill were calculated, allowing for the identification of which of the speaking skill was more affected by RHD. The results were demonstrated in Table 8.

Table (8)

Results of regression analysis of the research variables for the RHD.

Independent Variable	Unstandardized Coefficient B	Std. Error	Standardized Coefficient Beta	T-value		Significance 0.05
				Comp.	Tab.	
Constant	8.608	1.453	----	5.923		Significance
Speaking	0.153	0.122	0.142	1.250	1.980	Insignificant

The table above showed the following:

– The regression coefficient (B) for the fixed limit was 8.608, and the estimated t–value was 5.923, exceeding the tabular t–value of 1.980 at a 0.05 significance level. This outcome suggested the existence of other variables influencing speaking skill that were not incorporated in the present study.

– The coefficient (B) for the relative contribution of RHD on speaking skill was found to be 0.153, which was not statistically significant. This was supported by the computed t–value of 1.250, which fell below the tabular t–value of 1.980 at a significance level of 0.05. This result, therefore, implied that this hemisphere of brain dominance had no quantifiable impact on the speaking skill variable.

2. Left Hemisphere: Multiple regression analysis was employed

to ascertain the association among the variables. The results revealed a 0.408 multiple correlation coefficient, a 0.167 squared correlation coefficient, and an adjusted coefficient of determination of 0.156. In contrast, the standard error was measured at 2.886, as depicted in Table 9.

Table (9)

Correlation coefficient value between the variables of LHD and speaking skill.

Variable	R	R square	Adjusted R Square	Std. Error Estimate
Left hemisphere	0.408	0.167	0.156	2.886

The table indicated that the multiple correlation coefficient between the predictor variable (LHD) and the predicted variables (speaking skill) was 0.408, which was statistically significant compared to the critical correlation coefficient value of 0.161 at a 0.05 significance level with 161 degrees of freedom. The adjusted coefficient of determination was 0.156, indicating that about 16% of the variation in speaking skill was explained by LHD. To establish the significance of LHD on speaking skill, multiple analysis of variance by regression was carried out, with findings presented in Table 10.

Table (10)

Results of multiple regression analysis of variance to identify the extent of the contribution of LHD to speaking skill.

SV	Square Mean	Degree of freedom	S.S	f-value		Sign Level 0.05
				Computed	Tabulated	
Regression	264.858	2	132.429	15.889	4.605	Sign.
Residual	1325.173	159	8.334			
Total	1590	161	----			

The table indicated that the LHD variable significantly contributed to speaking skill, as the computed f-value for the multiple regression analysis of variance was 15.889, exceeding the tabulated f-value of 4.605 at a 0.05 significance level with 2 and 159 degrees of freedom. To identify the LHD relative standard contribution to the speaking skill variable, the values of the standard regression coefficients (Beta) corresponding to the speaking skill were calculated, allowing for the identification of which of the speaking skill was more affected by the LHD. Table 11 demon-

strated the results.

Table (11)

Results of regression analysis of the research variables for the LHD.

Independent Variable	Unstandardized Coefficient B	Std. Error	Standardized Coefficient Beta	T-Value		Significance 0.05
				Comp.	Tab.	
Constant	7.374	1.056	----	6.986	1.960	Sign.
Speaking	0.356	0.064	0.412	5.567		Sign.

The table showed the following:

– The value of the regression coefficient (B) was 7.374, and the computed t–value of 6.986 exceeded the tabulated t–value of 1.960 at a 0.05 significance level. This outcome signified the existence of additional variables influencing speaking skill that were excluded from the present study.

– The relative contribution value (B) of the LHD in speaking skill was 0.356, which was statistically significant, as the computed t–value of 5.567 surpassed the tabulated t–value of 1.960 at a 0.05 significance level. The standard contribution to the beta value was 0.412, and the square of the beta value was 0.169; hence, nearly 17% of the variation in speaking performance was attributable to the relative influence of LHD.

3. Whole Hemisphere: Multiple regression analysis was employed to ascertain the association among the research variables. The results revealed that the multiple correlation coefficient among the variables was 0.447, the square of the correlation coefficient was 0.200, and the adjusted coefficient of determination was 0.163. Conversely, the standard error was valued at 4.856, as demonstrated in Table 4.12.

Table (12)

Value of the correlation coefficient between the variables of WHD and speaking skill.

Variables	R	R Square	Adjusted R Square	Std. Error Estimate
Whole hemisphere	0.447	0.200	0.163	4.856

The table above revealed that the multiple correlation coefficient between the predictor variable (WHD) and the predicted variable (speaking skill) was 0.447, which was statistically signifi–

cant relative to the 0.296 value of the critical correlation coefficient at a 0.05 significance level and 45 degrees of freedom. Additionally, the modified coefficient of determination was 0.163, signifying that around 16% of the variance in speaking skill was attributable to WHD. To ascertain the importance of WHD to speaking skill, multiple regression analysis of variance was employed, with the results presented in Table 12.

Table (12)

Results of multiple regression analysis of variance to identify the extent of the contribution of WHD to speaking skill

S V	Square Mean	Degree of freedom	S.S	f-value		Sign Level 0.05
				Computed	Tabulated	
Regression	253.148	2	126.574	5.367	5.178	Sign.
Residual	1014.091	43	23.584			
Total	1267.239	45	----			

The table indicated that the WHD variable significantly influenced speaking skill, as the computed f-value from the multiple regression analysis of variance was 5.367, exceeding the critical f-value of 5.178 at a 0.05 significance level with 2 and 43 degrees of freedom. To ascertain the standard relative contribution of the WHD variable to the speaking skill variable, the values of the standard regression coefficients (Beta) corresponding to the speaking skill were calculated, allowing for the identification of the speaking skill that was more affected by WHD. The results were demonstrated in Table 13.

Table (13)

Results of regression analysis of the research variables for the whole brain hemisphere dominance.

Independent Variable	Unstandardized Coefficient B	Std. Error	Standardized Coefficient	T-Value		Significance 0.05
				Comp.	Tab.	
Constant	7.718	3.688	----	2.093		Significant
Speaking	0.823	0.255	0.506	3.225	2.021	Significant

The table showed the following:

– The regression coefficient (B) for the constant limit was 7.718, and the computed t-value of 2.093 surpassed the tabulated t-value of 2.021 at a 0.05 significance level. This outcome indicated the existence of additional variables influencing speaking

skill that were excluded from the current study.

– The value of (B) for the relative contribution of hemisphere dominance across the WHD in the speaking skills was 0.823, which was statistically significant, as the computed t–value of 3.225 surpassed the tabulated t–value of 2.021 at a 0.05 significance level. The standard contribution to the beta value was 0.506, and the square of the beta value was 0.256; hence, about 26% of the explained variation in speaking skill was attributable to the relative influence of WHD.

Overall, the study successfully answered its questions, and the results revealed that Iraqi EFL university students varied in their brain hemisphere dominance, with left–brain dominance being the most common. Speaking performance was generally at a medium level, suggesting moderate proficiency with noticeable limitations in fluency and confidence.

A positive correlation was found between BHD and speaking skill. Students with left–brain dominance (LHD) performed better in speaking tasks, followed by those with whole–brain dominance (WHD), while right–brain dominant (RHD) students showed weaker speaking abilities. This indicates that left–hemisphere functions, such as analytical and linguistic processing, support stronger verbal output.

Furthermore, statistical analysis showed that WHD accounted for the highest percentage of variance in speaking performance (around 26%), followed by LHD (17%), while RHD had minimal impact. These findings highlight the role of cognitive style in shaping students' speaking abilities and suggest that teaching strategies should consider BHD to enhance oral proficiency.

5. Conclusions and Recommendations

The subsequent conclusions are drawn from the collected results:

1.The study revealed significant variations in hemispheric dominance patterns (right, left, whole) among Iraqi EFL university students, suggesting that individual differences in brain dominance may influence language learning processes and performance.

2. The study found that students exhibited a medium level of performance in speaking skill.

3. Correlation analysis between hemispheric dominance and students' speaking skills revealed a medium to strong correlation was observed with LHD and a weak to moderate relationship with WHD, while a very weak relationship was found for RHD.

4. The analysis of brain hemisphere dominance accounted for varying degrees of variance in language skill performance: LHD accounted for 17% of the variance in speaking, and WHD explained 26% of the variance in speaking.

5. The findings conclude that BHD plays a crucial role in students' language speaking skill. This insight opens up opportunities for further research into the brain's role in language learning and highlights the potential for utilizing these differences in language teaching and learning environments.

Based on the study's findings, the following recommendations are presented.:

1. Educators need to keep in mind that learners with varying brain dominances might react differently to methods of teaching. As such, teachers need to vary teaching approaches that engage both hemispheres, for instance, through the use of activities involving visual and auditory aids, interactive sessions, and hands-on understanding to promote writing and speaking skills.

2. Students need to be made aware of different brain dominance patterns (right, left, whole) and how they can affect their learning of English. Students can take simple tests or consultations to determine their BHD. Making students aware of their BHD motivates them to be aware of their strengths and weaknesses in language skills. It also makes them aware of how to design their learning and decide on the correct ways that suit them.

3. The developers of curricula should incorporate a balanced variety of learning activities that engage both sides of the brain in English language programs. Curricula must incorporate not only creative and analytical tasks but also activities involving the use of both sides. The tasks must be well-balanced to comprise

those that enable creative writing—such as the composition of short stories—to assist students with RHD, analytical speech activities—such as text analysis or logical presentations—for students with LHD, and tasks that call for the integration of skills—such as writing and acting out dialogues—to assist students with WHD.

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