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Aziz HAKIMOV[a]

[a]*Lecturer at the International Islamic Academy of Uzbekistan*
E-mail: azizhakimov@gmail.com

LINGUISTIC METHODOLOGY OF SCIENTIFIC TERM FORMATION IN THE ARABIC LANGUAGE

Abstract. *This article provides a theoretical and analytical study of the linguistic methodology of scientific term formation in the Arabic language. The research examines the role of terminology in Arabic linguistics, its close relationship with morphology (ṣarf) and syntax (naḥw), and its significance in ensuring precision and unambiguity in the expression of scientific concepts. The article explores the formation of the concept of "term," the process of semantic transition from lexical meaning to scientific and terminological meaning, and analyzes the main methods used in scientific term formation – derivation, analogy, metaphor, Arabization, compounding, and semantic generation – from a linguistic perspective. In addition, the study highlights the role of norms and principles developed by Arabic language academies in systematizing and unifying scientific terminology. The findings confirm that the internal linguistic resources of Arabic possess sufficient potential for the creation of scientific terminology and its adaptation to the requirements of modern science.*

Keywords: *Arabic language, scientific term, terminology studies, linguistic methodology, scientific norms, Arabic language academies.*

INTRODUCTION

Scientific knowledge can be systematically articulated and transmitted only through a well-developed and stable terminological system. The precision of scientific discourse depends largely on the clarity, consistency, and standardization of the terms it employs. In this respect, the formation and regulation of scientific terminology represent a

central concern of modern linguistics. Language not only functions as a medium of communication but also serves as a fundamental instrument for conceptualization and knowledge organization.

Historically, the Arabic language has played a prominent role as a language of science, intellectual inquiry, and cultural development. Its capacity to generate and sustain scientific knowledge has been closely linked to its rich and highly structured terminological system. Within core linguistic disciplines such as morphology and syntax, Arabic terms have ensured semantic accuracy, conceptual stability, and logical coherence. These features have enabled Arabic to function effectively as a scholarly language across various fields of knowledge.

In the context of contemporary scientific and technological advancement, the growing demand for new concepts has intensified the need to reassess the methodological foundations of scientific term formation in Arabic. Understanding the linguistic mechanisms through which terms are created, adapted, and standardized is therefore of critical importance. This article aims to examine the linguistic methodology of scientific term formation in the Arabic language, with particular attention to its theoretical principles, historical development, and practical applications.

MAIN PART

Scientific knowledge can be systematically expressed and scientific concepts can be precisely defined only through a well-established terminological system. From this perspective, the creation and standardization of scientific terms constitute one of the most pressing issues in modern linguistics. Historically, the Arabic language developed as a language of knowledge, intellectual thought, and culture, and its scientific capacity has been manifested primarily through a coherent and structured terminological system. Terms used within fundamental linguistic disciplines such as morphology and syntax ensure accuracy and semantic stability in scientific discourse.

In the context of contemporary scientific development, the increasing demand for new concepts and terminology necessitates a reconsideration of the methodological foundations of scientific term formation in Arabic. In particular, the analysis of lexical sources of terms, their transition into specialized scientific meanings, and the linguistic mechanisms employed in term creation is of great importance. Therefore, this article

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aims to investigate the linguistic methodology of scientific term formation in the Arabic language, focusing on its theoretical foundations and practical principles.

The issue of scientific term formation in Arabic represents a complex process that integrates both theoretical and applied dimensions of linguistics. A scientific term is not merely a naming device for a specific concept; it also plays a crucial role in systematizing knowledge within a discipline and transmitting it clearly and consistently across generations. Consequently, term formation in Arabic linguistics has been carried out in accordance with established linguistic rules, methodological principles, and the internal resources of the language.

One of the major strengths of Arabic in scientific term formation lies in the sophistication of its morphological and syntactic systems. Morphology provides a wide range of derivational patterns that allow the formation of numerous semantically nuanced words from a single root. This feature offers extensive possibilities for the precise and systematic expression of scientific concepts. Syntax, in turn, ensures the correct usage of terms in discourse and clarifies logical relations between them, thereby contributing to semantic clarity and coherence.

The earliest stages of scientific term formation in Arabic are closely connected with the emergence of Islamic civilization, with the Qurʾān serving as a primary source in this process. Many Qurʾānic words underwent semantic transformation, moving from general lexical meanings to specialized religious and scientific meanings. As a result, words that once conveyed ordinary meanings became established terms in fields such as Islamic jurisprudence, theology, and other religious sciences. This process represents a significant example of semantic development in the Arabic language.

Scholars of theology, jurisprudence, and grammar played a decisive role in shaping the Arabic terminological system. They reinterpreted words used in everyday speech for scholarly purposes and endowed them with precise and stable meanings. Through this process, discipline-specific terminological systems emerged and continued to evolve over subsequent centuries.

Among the principal methodological approaches to scientific term formation in Arabic, derivation occupies a central position. Through derivation, a variety of grammatical forms and semantic layers can be generated from a single root. This method relies on the internal linguistic resources of Arabic and serves to preserve

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the language's structural and cultural integrity. Especially in the context of modern scientific disciplines, derivation enables the natural expansion of terminology in line with linguistic norms.

Analogy also plays an important role in scientific term formation. By applying existing linguistic patterns to new concepts, analogy facilitates the creation of terms that are both intelligible and widely acceptable. Arabic linguists have effectively employed analogy as a methodological tool for naming emerging concepts across various scientific fields.

Metaphor represents another significant mechanism in the formation of scientific terms. Through metaphorical transfer, words acquire new meanings that reflect abstract or specialized concepts. Metaphorically formed terms often convey scientific ideas in an expressive and accessible manner, thereby enhancing their acceptance and usage within scholarly discourse.

Arabization, defined as the adaptation of foreign lexical items into Arabic, constitutes an additional method of scientific term formation. This approach has generally been employed only when necessary. Borrowed terms are modified in accordance with Arabic phonological and morphological rules before being integrated into the linguistic system. Nevertheless, Arabic linguists have consistently preferred to rely on the internal resources of the language whenever possible, limiting the use of Arabization.

Compounding, or the formation of a single word from two or more elements, has also been used to create scientific terms. This method allows complex concepts to be expressed concisely and efficiently. However, compounded terms must conform to the phonetic and aesthetic norms of Arabic to ensure ease of pronunciation and acceptability.

Semantic generation refers to the assignment of new, modern meanings to existing words. This method has proven particularly effective in expressing concepts arising from technological and scientific advancements. Through semantic generation, Arabic demonstrates a high degree of adaptability and semantic flexibility.

In the twentieth century, the issue of scientific term formation and standardization in Arabic entered a new phase. Arabic language academies established in various countries undertook systematic efforts to organize terminology, unify usage, and adapt the language to the demands of modern science. The principles developed by these institutions aimed to ensure that scientific terms remain concise, precise, and unambiguous.

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Special attention was given to the unification of terminology, as the use of different terms for the same concept across regions could hinder effective scientific communication. Consequently, terminological standardization was recognized as a fundamental prerequisite for scientific progress. In general, the linguistic methodology of scientific term formation in Arabic is grounded in the language's internal resources, historical experience, and scholarly traditions. Methods such as derivation, analogy, metaphor, Arabization, compounding, and semantic generation function complementarily in shaping a comprehensive terminological system. This demonstrates that Arabic is capable not only of preserving its historical legacy but also of meeting the terminological demands of contemporary scientific inquiry.

The results of the study demonstrate that scientific term formation in the Arabic language is not a random process but a systematic phenomenon based on a well-defined linguistic methodology. Scientific terms have developed through the interaction of morphological and syntactic principles, historical experience, and evolving scientific needs. Derivation and analogy emerge as the primary mechanisms of term formation, while metaphor, semantic generation, and compounding serve as supportive strategies. Arabization is employed selectively and only when necessary.

Furthermore, the activities of Arabic language academies have played a decisive role in standardizing terminology and ensuring its consistent usage across the Arab world. Overall, the findings confirm that the internal linguistic resources of Arabic are sufficient to generate scientific terminology capable of addressing the requirements of modern science. The study contributes both theoretically and practically to the fields of Arabic linguistics, terminology studies, and contemporary scientific discourse.

CONCLUSION

The analysis presented in this study demonstrates that scientific term formation in the Arabic language is a systematic and methodologically grounded process rather than a spontaneous or arbitrary phenomenon. Arabic scientific terminology has evolved through the interaction of the language's internal linguistic resources, historical experience, and the changing demands of scientific knowledge. Morphological and syntactic principles have played a central role in ensuring the precision and stability of terms across disciplines.

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Among the various mechanisms of term formation, derivation and analogy emerge as the most productive and foundational methods, allowing Arabic to expand its terminology while preserving its structural integrity. Other strategies – such as metaphor, semantic generation, and compounding – function as complementary tools that enhance expressive capacity and conceptual clarity. Arabization, while present, is applied selectively and only when internal linguistic resources are insufficient.

Furthermore, the efforts of Arabic language academies in the modern period have been instrumental in organizing, unifying, and standardizing scientific terminology. Their work has significantly contributed to improving consistency in usage and facilitating effective scientific communication across the Arab world. Overall, the findings confirm that Arabic possesses sufficient linguistic potential to meet the terminological requirements of modern science. This study contributes to the theoretical understanding of Arabic linguistic methodology and offers practical insights for terminology development, reinforcing the role of Arabic as a dynamic and adaptable language of scientific discourse.

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