

**Arabizing Science: A Civilizational
Imperative, Lingual Elevation, and
Contemporary Challenges**

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Abstract:

This study outlines a comprehensive investigation into the multifaceted phenomenon of Arabizing science in the Arab world. Drawing on historical context that underscores the symbiotic relationship between language and scientific advancement, the research addresses the critical debate surrounding the feasibility and desirability of Arabization. It highlights the inherent difficulties in translation and terminology standardization, alongside concerns regarding the global employability of Arabized graduates. The proposal argues that despite these initial challenges, the immense effort required is justified by the profound cultural and civilizational gains that the Arabic language and the Arab nation stand to achieve. Grounded in empirical data from leading language classification and publication databases (e.g., Ethnologue, Statista, Web of Science/Scopus), the study provides a comparative analysis of Arabic against other prominent global languages to illuminate current linguistic disparities in scientific output, speaker numbers, and overall usage. It critically examines recent pivotal initiatives, such as Grand Imam Ahmed Al-Tayeb's decision to Arabize medical curricula at Al-Azhar University, and analyzes the diverse reactions, advocating that a long-term vision for linguistic and national elevation must prevail over short-sighted objections. Ultimately, this research demonstrates the inevitable link between the elevation of the Arabic language and the advancement of the Arab nation through strategic Arabization efforts.

Keywords: *Arabization of Science, Language and Civilization, Scientific Knowledge, Linguistic Identity, Al-Azhar, Medical Curricula, Global Language Rankings.*

ملخص:

تُقدم هذه الدراسة بحثاً شاملاً في ظاهرة تعريب العلوم متعددة الجوانب في العالم العربي. واستناداً إلى السياق التاريخي الذي يُبرز العلاقة التكافلية بين اللغة والتقدم العلمي، يتناول البحث الجدل النقدي الدائر حول جدوى التعريب وضرورته. ويُسلط الضوء على الصعوبات الكامنة في الترجمة وتوحيد المصطلحات، إلى جانب المخاوف المتعلقة بإمكانية توظيف الخريجين المُعَرَّبِينَ عالمياً. ويُجادل المقترح بأنه على الرغم من هذه التحديات الأولية، فإن الجهد الهائل المطلوب يُبرَّر بالمكاسب الثقافية والحضارية العميقة التي ستحققها اللغة العربية والأمة العربية. واستناداً إلى بيانات تجريبية من قواعد بيانات تصنيف ونشر اللغات الرائدة (مثل إنثولوج، وستاتيستا، وشبكة العلوم/ سكوبس)، تُقدِّم الدراسة تحليلاً مُقارناً للغة العربية مع لغات عالمية بارزة أخرى لتسليط الضوء على التفاوتات اللغوية الحالية في الإنتاج العلمي، وأعداد المتحدثين بها، واستخدامها العام. يتناول البحث بشكل نقدي المبادرات المحورية الأخيرة، مثل قرار الإمام الأكبر أحمد الطيب بتعريب المناهج الطبية في جامعة الأزهر، ويحلل ردود الفعل المتباينة، داعياً إلى تغليب رؤية بعيدة المدى للنهوض اللغوي والقومي على الاعتراضات قصيرة النظر. ويوضح البحث في نهاية المطاف الصلة الحتمية بين النهوض باللغة العربية وتقدم الأمة العربية من خلال جهود التعريب الاستراتيجية.

الكلمات المفتاحية: تعريب العلوم، اللغة والحضارة، المعرفة العلمية، الهوية اللغوية، الأزهر، المناهج الطبية، التصنيفات العالمية للغات.

I. Introduction

Throughout history, language has been the primary vehicle for the transfer of knowledge and the bedrock of civilization. The Arabic language, in particular, played a monumental role in the flourishing of sciences and humanities, serving as the lingua franca of scholarship during a golden age of intellectual advancement. This historical precedence highlights a fundamental truth: the flourishing of science within a nation invariably elevates the stature and importance of its language. Conversely, a language's vitality often mirrors the scientific prosperity of its speakers. From ancient Egyptian hieroglyphs conveying advanced mathematics, to the philosophical and scientific texts of classical Greek, to the vast knowledge translated and expanded upon in Arabic during the Islamic Golden Age, and ultimately to modern English dominating scientific discourse today – examples across epochs consistently demonstrate this symbiotic relationship.

To further contextualize this debate, it is crucial to examine the global standing of languages today. Language classification websites provide empirical data on various metrics, including the number of native speakers, overall speakers, economic importance, and the volume of scientific publications. Reputable sources for such comparisons include Ethnologue (Ethnologue, n.d.), Statista (Statista, 2024a), and major academic databases like Web of Science or Scopus for publication volume (Clarivate, n.d.; Elsevier, n.d.). Additionally, reports from organizations like the World Economic Forum (World Economic Forum, n.d.) often provide insights into language power and economic utility.

A comparative analysis of Arabic against other major global languages reveals significant disparities. English consistently ranks as the dominant language in scientific publication, economic influence, and often as a key lingua franca (Statista, 2024b; Clarivate, n.d.). Chinese, despite boasting the largest number of native speakers globally, lags behind English in scientific publication volume, underscoring that sheer speaker numbers do not automatically translate to scientific dominance. Arabic, while a major global language in terms of speakers and cultural reach, faces challenges in its current scientific output compared to English and other leading languages, contributing to the perceived "gap." Understanding the reasons for these discrepancies – often tied to historical scientific revolutions, geopolitical influence, and educational policies – is paramount for the Arabization debate.

In this context, the contemporary pursuit of Arabizing science emerges not merely as a linguistic exercise but as a strategic imperative. It aims to empower the Arabic language to absorb, transmit, and actively contribute to cutting-edge scientific developments. The study tackles this complex endeavor, examining its historical and current motivations, the challenges it faces, and the potential it holds for the Arab world. A recent significant development, the decision made by His Eminence Sheikh of Al-Azhar, the Grand Imam Ahmed Al-Tayeb, issued on August 29, 2023, to begin the process of Arabizing medical curricula at Al-Azhar University, powerfully highlights the contemporary relevance and urgency of this debate (Al-Azhar Grand Imam's Office, 2023). This pivotal directive, emerging from one of the Islamic world's foremost intellectual authorities,

reflects a profound understanding of the deep-seated link between language and civilization. It aims to restore Arabic to its rightful place as a language of knowledge and innovation, fostering a comprehensive ecosystem where scientific thought is naturally conceived, taught, and developed in Arabic, thereby empowering Arab youth, strengthening Arab identity, and contributing uniquely to global knowledge production. This bold move, while hailed by many as a necessary stride towards cultural self-reliance and intellectual empowerment, has also, as noted, elicited vociferous objections and reactions, often rooted in a shortsighted perception of the benefits versus the immediate difficulties (News Agency, 2023).

II. Statement of the Problem

The Arabization of science in the Arab world faces an ongoing and often passionate debate, creating complex challenges that directly impact the effectiveness of education, individuals' access to global knowledge, and the very formation of linguistic identity. Beyond these, the Arabization process itself is inherently difficult and fraught with significant translation hurdles, encompassing the complex task of establishing universally accepted cultural and scientific equivalents for technical terminology. Furthermore, a critical concern arises regarding the employability and professional mobility of graduates educated primarily in Arabized scientific curricula, potentially hindering their opportunities in non-Arabic speaking global markets and limiting cross-cultural scientific collaboration. This raises the crucial questions:

- How does the Arabization of science intersect with issues of linguistic identity, scientific knowledge production, and global accessibility in the contemporary Arab context?
- Is the immense effort required for Arabizing science justified by the envisioned long-term gains?

This study holds particular importance given the multifaceted challenges and aspirations of the Arab world in education and scientific research. It seeks to provide a deeper understanding of the cultural, educational, and economic ramifications of Arabizing science, thereby enriching the ongoing discussion about the future of Arabic as a language of science. Crucially, it aims to highlight the profound cultural and civilizational gains that the Arabic language and the Arab nation stand to achieve through Arabization. While acknowledging that the beginning of such a monumental undertaking will undoubtedly be difficult, the research posits that the ultimate goal, encompassing cultural revival and empowered knowledge production, far outweighs initial hurdles. By offering practical insights for policymakers and educators, this research can contribute to developing more effective Arabization strategies.

III. Research Objectives

- To analyze the intricate relationship between the Arabization of science and linguistic identity in Arab societies.
- To evaluate the impact of Arabizing science on the processes of scientific knowledge production, dissemination, and accessibility.

- To identify the specific challenges (e.g., translation, terminology standardization, graduate employability) and opportunities (e.g., cultural preservation, knowledge ownership) associated with science Arabization efforts in the region.
- To propose actionable recommendations to strategically enhance the role of the Arabic language in the scientific field.

IV. Literature Review

The provided literature review comprehensively examines the Arabization of science, addressing its historical roots, linguistic hurdles, educational policies, impact on knowledge dissemination, and socio-cultural implications.

Historically, Arabic served as a prominent language of science, particularly during the Islamic Golden Age. Studies highlight extensive translation movements that integrated Greek, Persian, Indian, and Syriac knowledge, leading to original scientific contributions (e.g., Isis journal articles; Al-Hassani, 2007; Saliba, 2007). This historical precedent underscores Arabic's capacity as a scientific language.

Linguistically, Arabization faces challenges in standardizing scientific and technical terminology. Researchers note difficulties in creating accurate and universally accepted Arabic equivalents for modern scientific concepts (e.g., Semantic Scholar articles). Arabic language academies across the Arab world strive to unify terminology, navigating debates between

linguistic purism and borrowing, and ensuring the acceptance of newly coined terms within the scientific community (Al-Haq & Al-Essa, 2016; Yaseen, 2016, as cited in *Frontiers*).

Regarding language policy in higher education, there's a tension between promoting Arabic as an instructional medium and the widespread adoption of English, especially in STEM fields. Mansour and Al-Rawahi's (2023) review in *Frontiers* discusses the "Arabization or Englishization of higher education," analyzing arguments for and against Arabization and examining country-specific efforts (e.g., Syria, Sudan, Jordan). This highlights the political and socio-economic factors influencing these policy decisions.

The choice of language also impacts knowledge production and accessibility. Studies reveal a relatively low volume of Arabic scientific publications in major international databases (e.g., Scopus, Web of Science, citing Clarivate and Elsevier data). This linguistic disparity affects researchers' visibility and public access to scientific advancements (e.g., The Peninsula Qatar article). While Arabization could democratize access and foster local innovation, concerns exist about potential isolation from the global scientific community.

Socio-culturally, Arabization is intertwined with linguistic and national identity. Suleiman (1994, 1996, 2003, 2006, 2011) extensively discusses language as a core component of Arab nationalism. However, academics and policymakers worry about the global employability and professional mobility of graduates educated primarily through Arabized curricula (e.g., Al-Hamlawi, 2024, as cited in The Peninsula Qatar; discussions

within the Frontiers review). This underscores the need to balance cultural pride with global competitiveness.

Finally, specific Arabization initiatives and their outcomes have been documented through case studies in countries like Syria and Sudan (Balla, 1991; Gasim, 2010; Suliman, 2004; Alhassan, 2022, all cited in Frontiers). These provide valuable insights into the successes and pitfalls of institutional-level Arabization efforts.

In essence, the existing literature provides a robust framework for understanding the historical legitimacy, technical and policy challenges, identity implications, and practical consequences of Arabizing science. This foundational knowledge is crucial for examining contemporary initiatives, such as the Al-Azhar effort, within this established context.

V. Methodology

This study employs a mixed-methods approach, combining both qualitative and quantitative research methods to thoroughly investigate the Arabization of science. This design allows for a nuanced, in-depth understanding of the phenomenon, complemented by robust empirical data.

Data Collection

- **Document Analysis:** We conducted a comprehensive review of various documents. This included examining university curricula, scientific textbooks (in both Arabic

and foreign languages), articles published in Arabic and international scientific journals, and official linguistic policy documents from educational and governmental institutions in selected Arab countries. We also analyzed public statements, media coverage, and academic responses concerning recent Arabization initiatives, such as the Grand Imam of Al-Azhar's decision, to understand the diverse reactions of support and opposition (Al-Azhar Grand Imam's Office, 2023; News Agency, 2023).

Data Analysis

- **Qualitative Data:** Documents were analyzed using Thematic Analysis. This systematic process helped identify recurring patterns, core themes, and underlying perspectives regarding the benefits, challenges, and societal impact of Arabization, particularly concerning the varied reactions to recent initiatives.
- **Quantitative Data:** Quantitative data, such as scientific publication statistics in Arabic versus other languages, was analyzed using descriptive statistics. This data was used to illustrate trends and disparities in scientific output and language usage, drawing from sources like Clarivate (n.d.) and Elsevier (n.d.).

VI. Findings

The study's findings are built upon empirical data from leading language classifications and publication databases, illustrating the current linguistic overview of scientific output.

The Ethnologue website, a widely recognized authority in language classification, publishes "The Ethnologue 200," a comprehensive list detailing the world's 200 most spoken languages (Ethnologue, n.d.). This list, a definitive source for over 15 years and frequently cited by leading publications, encompasses languages spoken by the vast majority of the global population. According to Ethnologue, over 88% of individuals use one of these top 200 languages as their native tongue, with hundreds of millions more utilizing them as second languages. The ranking considers both native and second-language speakers to present a holistic view of total language usage worldwide (Ethnologue, n.d.).

To illustrate the current linguistic overview of scientific publications, the study utilizes data derived from comprehensive analyses of leading academic databases, including Scopus and Web of Science. While precise real-time percentages for every language can vary slightly by date and specific query, the overall trend of English dominance is consistently observed across numerous bibliometric studies.

- **Dominance of English in Scientific Publications:** Analyses of academic databases like Scopus and Web of Science consistently show that English overwhelmingly dominates scientific publications, typically accounting for **78-95% of all indexed scientific content** (Clarivate, n.d.; Elsevier, n.d.). This highlights the significant disparity between Arabic and other prominent global languages in terms of scientific output. For instance, English forms the largest segment of scientific publications, followed by

smaller segments for Chinese (Mandarin), Spanish, Portuguese, French, German, and a noticeably smaller segment for Arabic (Based on analyses of data from Clarivate, n.d.; Elsevier, n.d., and existing bibliometric studies on Scopus/Web of Science content).

- **Disparity Between Speaker Numbers and Scientific Output:** While languages like Chinese boast the largest number of native speakers globally and Arabic has a significant number of total speakers (reflecting its cultural reach), their proportions in global scientific publications are considerably smaller compared to English (Ethnologue, n.d.; Statista, 2024a). This indicates that a large speaker base does not automatically translate to scientific dominance. For example, Chinese shows a very large number of total speakers but a comparatively much smaller volume of scientific publications. Conversely, English demonstrates high numbers in both categories, reinforcing its role as the lingua franca of science. Arabic exhibits a significant number of total speakers but a very small volume of scientific publications, visually emphasizing the challenge and the impetus for Arabization (Derived from data by Ethnologue, n.d., Statista, 2024a, and analyses of scientific publication databases).
- **Historical Precedent and Symbiotic Relationship:** Historically, Arabic played a monumental role in scientific advancement during the Islamic Golden Age (Al-Hassani, 2007; Saliba, 2007). This historical precedence **emphasizes** the strong, symbiotic relationship between a

language's vitality and a nation's scientific prosperity. The current "gap" in Arabic scientific output suggests a disconnect from this historical role.

- **Arabization as a Strategic Imperative:** The paper frames the contemporary pursuit of Arabizing science not merely as a linguistic exercise but as a strategic imperative for the Arab world. It aims to enable the Arabic language to absorb, transmit, and contribute to cutting-edge scientific developments, thereby fostering a comprehensive ecosystem where scientific thought can thrive in Arabic.
- **Al-Azhar Initiative and Diverse Reactions:** The decision by Grand Imam Ahmed Al-Tayeb to Arabize medical curricula at Al-Azhar University is highlighted as a pivotal contemporary development (Al-Azhar Grand Imam's Office, 2023). Analysis of public statements and media coverage concerning this initiative revealed a broad spectrum of reactions (News Agency, 2023):
- **Positive Sentiments:** Proponents view it as a courageous and necessary step towards linguistic self-reliance, intellectual empowerment, fostering deeper understanding among students, enhancing national identity, and democratizing access to scientific knowledge.
- **Negative Sentiments/Concerns:** Critics raise practical challenges such as difficulties in developing high-quality Arabic scientific materials, potential limitations on graduates' global employability, fears of isolating Arab scientific communities from international research, and significant economic and logistical costs.

- **Justification of Effort by Long-Term Gains:** Despite the acknowledged initial difficulties and the "vociferous objections" rooted in short-sighted perceptions, the study argues that the immense effort required for Arabization is justified by the profound cultural and civilizational gains for the Arabic language and the Arab nation. The research posits that cultural revival and empowered knowledge production ultimately outweigh initial hurdles.
 - **Inevitable Link to National Advancement:** The findings unequivocally underscore the crucial link between the elevation of the Arabic language's standing and the advancement of the Arab nation as a whole through strategic Arabization efforts.
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VII. Discussion

Our findings provide a critical lens through which to interpret the multifaceted phenomenon of Arabizing science, aligning with the theoretical framework that posits a fundamental symbiotic relationship between language and scientific advancement (Al-Hassani, 2007; Saliba, 2007). The empirical data unequivocally demonstrates English's overwhelming dominance in scientific publications, accounting for 78-95% of indexed content in major databases like Scopus and Web of Science (Clarivate, n.d.; Elsevier, n.d.). This stark disparity highlights the significant "gap" in Arabic scientific output, despite Arabic's substantial global speaker numbers (Ethnologue, n.d.; Statista, 2024a). This imbalance underscores that a large linguistic community does not automatically translate to

scientific prominence, a reality also observed with Chinese. The current global language rankings thus underscore the necessity of Arabization as a strategic imperative to elevate the Arabic language's scientific standing, directly addressing Research Objective 2 regarding scientific knowledge production and dissemination.

The journey of Arabizing science, however, is not without its formidable challenges, which our analysis of reactions to the Al-Azhar initiative vividly illustrates. The core difficulties in translation and terminology standardization are paramount. As noted in the literature, establishing accurate and universally accepted Arabic equivalents for modern scientific concepts is a complex endeavor (Al-Haq & Al-Essa, 2016; Yaseen, 2016, as cited in Mansour & Al-Rawahi, 2023). This process demands immense effort from Arabic language academies and scientific communities to navigate linguistic purism versus practical borrowing, ensuring that newly coined terms gain widespread acceptance. Beyond translation, a significant concern revolves around the global employability and professional mobility of graduates educated primarily through Arabized curricula. Critics fear that such graduates might face hurdles in non-Arabic speaking global markets and that Arabized scientific communities could risk isolation from cutting-edge international research predominantly published in English. This tension between promoting Arabic as an instructional medium and the widespread adoption of English in STEM fields is a persistent debate in higher education policy across the Arab world (Mansour & Al-Rawahi, 2023). These challenges are central to Research Objective 3.

Diverse Reactions to Al-Azhar's Arabization Initiative

The Grand Imam Ahmed Al-Tayeb's directive to Arabize medical curricula at Al-Azhar University (Al-Azhar Grand Imam's Office, 2023) has sparked a broad spectrum of reactions across traditional media and social platforms (News Agency, 2023), perfectly encapsulating the complex interplay between cultural aspiration, pragmatic concerns, and global realities. This analysis contributes to understanding the relationship between Arabization and linguistic identity (Research Objective 1).

- **Positive Sentiments:** Many academics, cultural figures, and members of the public have lauded the decision as a courageous and necessary step towards **linguistic self-reliance and intellectual empowerment**. Proponents often highlight the historical precedent of Arabic as a scientific language (Al-Hassani, 2007; Saliba, 2007), arguing that Arabization will foster deeper understanding among students, enhance **national identity** (Suleiman, 1994, 1996, 2003, 2006, 2011), and make scientific knowledge more accessible to the broader population. Media commentary frequently expresses pride and hope for a revitalized scientific role for Arabic, viewing it as a move to reclaim linguistic and cultural ownership of knowledge.
- **Negative Sentiments/Concerns:** Conversely, significant opposition and concern have been voiced. Critics often raise practical challenges, such as the perceived difficulty in developing high-quality Arabic scientific textbooks and teaching materials, the potential for reduced global

employability for graduates (Al-Hamlawi, 2024, as cited in The Peninsula Qatar; Mansour & Al-Rawahi, 2023), and the fear of isolating Arab scientific communities from cutting-edge international research predominantly published in English. Concerns about the economic costs and the sheer logistical effort required for such a monumental shift are also common. Discussions in this vein often involve arguments about the efficiency of learning in English for global competitiveness and the practicalities of a rapid language transition in highly specialized fields.

- **Analysis of the Disparity:** This varied response underscores a fundamental tension between immediate convenience and a vision for profound civilizational advancement. While the initial hurdles are undeniably significant, they are often overemphasized by critics who may not fully appreciate the **long-term strategic benefits of linguistic self-sufficiency and the enhanced intellectual ownership** that Arabization promises. The debate highlights a crucial balance that must be struck: maintaining competitiveness in a globalized scientific landscape while simultaneously nurturing and empowering one's linguistic and cultural identity. The historical capacity of Arabic as a language of science, coupled with the need to democratize access to knowledge and foster local innovation, provides a compelling argument for overcoming these initial challenges. This directly informs the **opportunities** associated with Arabization (Research Objective 3).

Ultimately, the discussion surrounding Arabization reflects a broader societal dialogue about identity, progress, and global integration. The findings reinforce that the immense effort required is not merely a linguistic undertaking but a profound cultural and civilizational imperative that promises long-term gains for the Arabic language and the Arab nation.

VIII. Conclusion

This study set out to investigate the multifaceted phenomenon of Arabizing science, emphasizing its historical roots, contemporary challenges, and profound civilizational implications. Our findings, grounded in empirical data from leading language classification and publication databases, unequivocally underscore the inevitable and crucial link between the elevation of the Arabic language's standing and the advancement of the Arab nation as a whole through strategic Arabization efforts.

The undeniable facts gleaned from reputable sources like Ethnologue, Statista, and leading academic publication databases (e.g., Web of Science/Scopus) reveal a stark reality: English overwhelmingly dominates global scientific output (Clarivate, n.d.; Elsevier, n.d.; Statista, 2024a). A comparative analysis of languages such as English, Chinese, and other globally influential languages clearly demonstrates that while factors like population size (as with Chinese, Ethnologue, n.d.) contribute to a language's overall importance, its true global scientific and economic influence is profoundly tied to its role in knowledge

production and dissemination. The current "gap" in Arabic scientific output, despite its significant number of speakers and rich cultural heritage, highlights an urgent need for concerted action.

The ambitious step taken by the Grand Imam of Al-Azhar on August 29, 2023, to Arabize medical curricula (Al-Azhar Grand Imam's Office, 2023) exemplifies a vision that recognizes this historical and contemporary reality. While this initiative has indeed elicited diverse reactions, ranging from strong support for linguistic self-reliance and national identity to concerns about practical challenges and global employability (News Agency, 2023), our research argues that perceived short-sightedness often overlooks the profound long-term cultural and civilizational gains.

In conclusion, while the journey of Arabization is inherently difficult, fraught with challenges in terminology standardization and integration into a globalized scientific landscape, the immense effort is not merely a linguistic exercise. It's a strategic imperative that promises cultural revival, empowered knowledge production, and the restoration of Arabic to its rightful place as a vibrant language of science. This endeavor is essential for the comprehensive advancement of the Arab nation, making the commitment to Arabization an ultimately rewarding path for the entire region.

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