

## **Multiplicity of scientific and technical terms: A problematic or a linguistic property?**

**Assia Laribi <sup>1</sup>**

<sup>1</sup>Hassiba Benbouali University of Chlef, Faculty of foreign languages Studies (Algeria).

**The E-mail Author:** [assia-laribi@hotmail.com](mailto:assia-laribi@hotmail.com)

**Received: 08/2023**

**Published: 03/2024**

### **Abstract:**

Our study is based on the idea that the multiplicity of terminology is neither a linguistic flaw nor a linguistic or terminological problem. It is not considered to be ambiguous. We will show how specialised terms can share the same characteristics as general vocabulary, in particular synonymy. In the course of this study, we will examine the origins of the modern theory of terminology formulated by Wüster, with the aim of clarifying the reasons why this theory and its proponents rely on standardisation and reject synonymy in order to facilitate communication between researchers worldwide. We will also discuss the modern theory of terminology, which is relatively supportive of the idea of synonymy. Finally, we will conduct a study of a number of common scientific terms in English and compare them with their synonyms to illustrate how the current era has imposed a stream of terminology that refers to the same concept. It remains the responsibility of individuals, researchers and different institutions to choose the terminology they consider appropriate.

**Keywords:** scientific terminology, technical terminology, multiplicity, synonymy, English, Arabic.

**Introduction:**

Scientific terminology is part of specialised language, an ancient phenomenon that predates human civilisation. It contains specific concepts that distinguish it from general terminology, but it can have certain characteristics, such as synonymy, which can be partial or complete. Scientific studies show that complete synonymy is rare because the contexts in which terms are used vary, even if only slightly. As far as scientific terminology is concerned, modern terminology theory allows for the existence of synonyms to a certain extent. Reality, however, shows the existence of numerous synonyms in different fields of science, due to linguistic, cultural and geographical diversity. This multiplicity of terminology often confuses users and poses challenges for researchers, raising concerns that lead to calls for terminology regulation and standardisation at scientific conferences and forums. Digital educational terminology is not exempt from this issue, especially considering its recent emergence due to its widespread use during the COVID-19 pandemic. Many applied and theoretical studies have addressed the challenges of teaching and learning at a distance, revealing significant differences in the use of terminology expressing the same concept

**Research question:** This study aims to answer the following question:

Does the multiplicity of scientific and technical terminology create confusion and chaos among learners?

Can we consider the multiplicity of scientific and technical terminology as a positive manifestation resulting from the vitality and dynamism of societies?

**Research objectives:** This study aims to explore the phenomenon of multiplicity in scientific and technical terminology from a social perspective. We will discuss a number of terms that have emerged in different scientific and cultural environments. The focus will be on the idea that synonymy can be seen as a desirable feature without seeing it as a challenge that requires collective efforts to eliminate it.

**1. History of terminology:** Scientific terminology is not a recent discovery, but its roots go back to ancient times. Aristotle was the first to create scientific terms, and Abu Qiraf was involved in inventing, collecting and classifying medical terminology. The scientific and technical aspects of terminology as we know it today began to emerge in the mid-20th century with the work of Eugen Wüster. His doctoral thesis, completed in 1930, included the general principles of terminology science. Wüster's motivation to establish specific rules and standards for what researchers later called "modern terminology theory" stemmed from his desire to eliminate ambiguity and facilitate communication between researchers from different cultural and linguistic backgrounds. This desire was influenced by several factors, which Campo (2012:21) summarises as follows

**A. The emergence of Esperanto:** The idea of creating this language was introduced by the young Lazar Ludwik Zamenhof when he published his work in Russian in 1887, entitled 'The Project of a Universal Language'. This project reflected his passion for the creation of a unified language. It originated in the multicultural city of Bialystok, which was home to Jews, Russians, Poles and ardent Germans, all of whom were prejudiced in favour of their own language and hostile to others. Zamenhof believed that learning foreign languages required considerable effort, time and money. He also believed that the establishment of a universal language would eliminate cultural

differences and, most importantly, facilitate communication between researchers and scholars (Tanton, 1993).

### **B. The Vienna Circle:**

The Vienna Circle had a significant impact on the development of philosophy and science in general, thanks to the meetings organised by a group of scholars from different intellectual and scientific fields, such as mathematics and social sciences. These meetings focused on the discussion of prominent intellectual and philosophical issues of the 20th century (Stadler, 2003). The scholars and researchers of the Vienna Circle were interested in creating a common scientific language to facilitate its use in scientific discussions.

### **C. Foundation of UNESCO:**

Following the outbreak of the First and Second World Wars, the United Nations Educational, Scientific and Cultural Organization (UNESCO) was established with the aim of promoting lasting peace by uniting peoples through dialogue and mutual understanding. UNESCO has always been concerned with eliminating inequality, promoting access to information and knowledge, and bridging the language divide. The organisation entrusted this task to individuals such as John Edwin Holmstrom, a prominent figure in the field of terminology. Holmstrom proposed the creation of specialised dictionaries for scientific terms, covering different languages. UNESCO also played a role in the creation of the International Bureau of Terminology and the International Organisation for Standardisation (ISO) (Campo, 2012).

#### **1. The general and modern theory of terminology:**

Eugen Wüster was the first to formulate the general theory of terminology, drawing on various fields of science and knowledge, with logic, epistemology and linguistics being the most prominent (see

Nedobity, 1983:69). Wüster focused on standardising terminology and making it globally accessible by establishing uniform international principles for describing and recording terms. To this end, he worked on the creation of a classification system to organise concepts in specialised dictionaries, where each domain of knowledge has its own independent set of terms, detached from any other profession. He also emphasised the importance of clarity in terms, avoiding ambiguity, and prioritising concepts over terms, a concept-oriented approach. Concepts were important to Wüster as the building blocks of knowledge, and symbols were assigned to convey these mental constructs. He also sought to eliminate any synonyms that conflicted with the general principles he outlined, emphasising standardisation and the elimination of ambiguity.

Wüster's theory was not convincing to many researchers who came after him. They sought to complement his theory with modern concepts. Cabré (2003) suggests that terminology science should not be considered as an independent discipline separate from other linguistic activities. Instead, it falls within the framework of language planning, which is concerned with language development and ensuring accurate and effective communication between different languages. This involves looking at terminology in different contexts and re-evaluating terms on the basis of new data, contexts, user needs and societal changes. The second point added by modern terminologists is the acceptance of a degree of synonymy, although this is strongly discouraged. This is no longer as controversial as it was in Wüster's theory.

### **The word and the term, what is the difference?**

According to Jennifer Pearson, quoted by Rondeau (see Khan: 2016), the term is essentially a linguistic sign with a signifier and a signified. The signifier is expressed by the denomination, which refers to the label

or name, while the signified refers to the concept. The term therefore represents the relationship between the denomination and the concept. On the other hand, Wüster sees the term as referring to the label or name, which we express as the signifier. Rondeau sees no difference between the term and the word, and if there is a difference, it lies in the fact that the term belongs to a specialised field. There are many researchers who have mentioned differences between the term and the word, and let us rely on what Zhu has indicated (see Khan: 2016, p. 699), who has drawn clear boundaries between the word and the term, which can be summarised as follows:

-Words derive their meaning from current usage and the contexts in which they exist.

-Terms derive their names from purposes and concepts, which means that concepts generate new terms for us.

-The term begins with the concept, which serves as a reference, and then arrives at the linguistic designation.

-Words can have several meanings (polysemous) and several words can have the same meaning.

-The term and the concept converge to form a single entity.

-There are cases where a single term has several meanings, or where several terms refer to the same concept.

From the differences mentioned by Zhu, it is clear that terms have the same characteristics as words. Therefore, synonymy is a linguistic feature shared by both words and terms, although Zhu himself considers multiplicity of meaning and synonymy as problematic issues that researchers should address in order to minimise or eliminate them.

### **Synonymy in terminology:**

Many researchers argue that synonymy should not be a feature of terminology because concepts expressed by multiple terms only lead to terminological chaos and increase the ambiguity of their usage. It is more appropriate for terminologies to be clear and to express a single concept. In addition to the opinion of the father of modern terminology, Wüster, who sees terminologies as unification and standardisation, there are numerous Western and Arabic studies that see the multiplicity of terms as a source of ambiguity that hinders the communication process (see Vogel 2008: 91).

In general language, the issue of synonymy has been extensively discussed from linguistic, lexicographic and even philosophical perspectives (see Rollins, C.D. 1950). The debate has intensified around the question of denying the existence of complete equivalence in synonymy, i.e. considering two words to be completely identical in meaning in all contexts. Although this is not impossible, it is extremely rare, and researchers should discuss the issue of synonymy in terms of partial equivalence, that is, there are some minor differences arising from subtle distinctions (Dolezal 2013: 2).

In terms of terminology, the reality of life imposes the phenomenon of multiplicity, whether we like it or not. Evidence of this is the use of terms such as 'mobile phone', 'mobile' and 'smartphone' to refer to the same device. These variations in usage are subject to the cultural context in which these terms are used. Similarly, the medical community may use terms such as "euthanasia", "mercy killing" or even the French term "mort douce" or "suicide assisté" to express the same concept. Even the term "terminology" itself may be referred to as "terms" or "technical terms."

We will not delve into the question of exact synonymy and analyse the linguistic, lexicographic and philosophical aspects. Instead, we will focus only on the concept from a pragmatic and social perspective, considering it as a global phenomenon caused by the evolution of life and the diversity of expression of concepts, which leads to variations in terminology in different geographical environments. However, this idea may lead us to consider these synonyms in terminology as confusing. Does this mean ambiguity and confusion? Wüster states that "standardisation was introduced to eliminate ambiguity and make terminologies effective tools for communication" (see Cabré 2003: 165). First of all, we need a definition of ambiguity and vagueness. The Cambridge Dictionary defines vagueness as "the quality of not expressing, knowing, describing, or deciding about something clearly". In the field of terminology, it occurs 'when it is not clear whether a term applies correctly to some case, and when it is difficult or impossible to provide a correct criterion for drawing the boundary of the term' (Dowding and Bosworth 2018: 6). Regarding ambiguity, the Cambridge dictionary defines it as "expressing something with more than one meaning, sometimes intentionally" (accessed 23 October 2023, Cambridge.org). The Al-Maany dictionary defines ambiguity as "uncertainty and lack of clarity". Based on the above, it is unlikely that we are aware of the meaning of confusion and ambiguity in the use of multiple terms to express the same concept. When we talk about "cybersecurity" and "information security", both terms refer to the protection of computers, computer systems and networks from any attempt at intrusion.

### **Examples of a multiplicity of scientific and technical terms in English and Arabic**

In the subsequent section, we will present a collection of scientific terms commonly used in the medical field, as well as other popular terms in the fields of computer science and digital education. Corresponding Arabic translation will be provided for each term.

**Euthanasia:** This term refers to assisted suicide procedures performed under medical supervision for patients who request it due to failure of treatment or loss of hope of recovery. Synonymous terms used interchangeably include "mercy killing" and "assisted suicide". In Arabic, the term "euthanasia" is used, borrowed from English, as well as "al-mawt al-rahim" and "al-mawt al-sahl."

**Fenestra ovalis:** An oval opening in the ear between the middle and inner ear. The synonym is "oval window". The corresponding term in Arabic is "fenestra ovalis."

**Paranoid disorder:** This psychological and medical term refers to a brain disorder characterised by the belief that one is surrounded by false people or that the world around one does not reveal the truth, resulting in constant vigilance. The synonymous term, as mentioned by Collins (2004), is "delusional disorder". In Arabic the term is "i'tirab baranoi" or "i'tirab wahami (dhillali)."

**Insomnia:** This refers to the inability to sleep and is also known as "insomnia". In Arabic the term is "al-arq."

**Hypertension:** This term refers to an increase in blood pressure above the normal range for a particular gender and age group. The synonym is "high blood pressure". In Arabic, the equivalent term is "irtifa' dughat al-dam."

**Diplopia:** This is a medical condition where the patient sees a single object as double. The synonym is "double vision". In Arabic, the equivalent term is "ru'ya muzdawijah."

**Influenza:** This refers to a serious respiratory illness commonly known as "flu". The corresponding term in Arabic is "al-influnza."

**Coronavirus:** This is an infectious disease caused by the SARS-CoV-2 virus. The English term for it is "Covid-19". In Arabic, it is called "fayrus kowrona" or "kowfid-19."

**Firewall:** A security system between the Internet and the public network that allows the passage of information to the Internet after checking incoming data before allowing it through. Synonymous terms include "network barrier" and "security guard". In Arabic, the equivalent term is "Jidar al-Himaya" or "Jidar al-Nari."

**Malware:** It refers to malicious software and is the official term used to describe all harmful programs that affect our computing devices. It can be used interchangeably with the term "virus". In Arabic, the corresponding terms are "Al-barmajiyat al-darah" or "Al-barmajiyat al-khabitha."

**Distance education:** This term refers to the geographical separation between teachers and students, where they are connected through electronic devices such as computers or mobile phones. The connection between participants in the educational process can be synchronous or asynchronous, allowing learners and teachers to participate in the education at different times. In English, the terms "remote education" and "remote learning" are synonymous. In Arabic, the corresponding terms are "At-tadris 'an b'd" (distance education), "At-ta'lim ghayr al-mubashir" (non-live learning), "At-ta'lim al-manzili" (home learning), "At-ta'lim al-mustaqil" (independent learning) and "At-ta'lim ghayr an-nizami" (non-formal learning).

**E-learning:**

This term refers to all types of education delivered through digital media such as computers and the Internet. Synonymous terms include "digital learning", "virtual learning", "internet learning" and "web-based learning". In Arabic, the term is "At-ta'lim al-iliktironi" or "At-ta'lim 'an b'd" (distance learning).

**Virtual learning:** This term refers to a digital classroom environment conducted over the Internet and equipped with software that allows interaction between teachers and students. Synonymous terms include "digital classroom", "online classroom environment", "web-based classroom" and "cyber classroom". In Arabic, the term used is "At-ta'lim al-aftiradi" (virtual learning).

**Hybrid learning:** It is an educational experience designed to combine and blend both distance and face-to-face learning.

**Blended learning:** The term 'blended learning' is often used as a synonym for 'hybrid learning' and is defined by Graham as an educational environment that combines face-to-face teaching with educational resources and the use of technology (Graham, 2008: 270). However, it should be noted that many researchers and educational institutions find this term confusing due to its ambiguity. Although the two terms are functionally similar, there are slight differences between them. Researchers point to two main differences: firstly, hybrid learning relies more on face-to-face teaching than on distance learning, whereas blended learning combines an equal balance of distance and face-to-face teaching.

**Flipped learning:** Flipped learning reverses the traditional use of instructional programs by moving materials traditionally presented in the classroom out of the classroom and into materials delivered through

technology and other means. The content covered in the classroom involves the application of these concepts or in-depth study under the guidance of the teacher (Saichaie, 2020, based on Graham, 2013). A study by Lage, Platt and Treglia (2000: 32) used the term 'inverted classroom' to refer to flipped learning. In this approach, students have the option of accessing lectures from home through technology, and class time is devoted to discussion and exploration of ideas. The term used in Arabic is "al ta'lim maakous", as published by UNESCO (unesco.org) on their website, where flipped learning is presented as an example of blended learning, i.e. online interaction followed by face-to-face teaching

**UNESCO:** Building Peace through Education, Science and Culture, communication and information

**Blended learning:** As mentioned above, blended learning combines face-to-face or face-to-face teaching with distance learning using technological means. According to the Encyclopedia of the Learning Sciences by Seel (2012), it is a pedagogical approach that combines different technologies, computer-based tools, different pedagogical methods and theories to facilitate the acquisition of required skills and competences. The synonyms mentioned by the researcher are "flexible learning", "blended e-learning" and "hybrid learning."

### **Conclusion:**

Terminology is constantly evolving and changing as a result of human usage throughout the world, resulting in variations in the expression of the same concept. For example, there are several names used to refer to certain herbs, such as lavender, lavendula and spike lavender, all of which refer to the same herb. In addition, there are different names for herbs that vary from one region to another within the same country, indicating that the multiplicity of terminology is a characteristic of the

field of terminology. The study of the models we have presented has shown a significant level of synonymy that is not specific to the Arabic language. On the contrary, the English language shows more specialisation in this regard than Arabic, which does not pose any problematic issues that require the intervention of scholars.

Moreover, the degree of similarity reaches absolute synonymy in most of the models we have presented. Finally, we can conclude that the issue of terminological diversity and technicality is simply a result of language evolution and is subject to preferences dictated by the environment, academic institutions and scientific communities. Since it is widespread and prevalent, we do not see it as a negative aspect, but rather as an enrichment and diversification of the language itself, allowing greater flexibility for both general and specialised terminology users.

### **References:**

- Allen M& (2019)" Distance education and student satisfaction. Handbook of distance education, edited by Grahame & Diehl. New York. Routledge.
- Cabré, M. T. (2003). "Theories of terminology: Their Description, Prescription and Explanation ", *Terminology*, 9(2), pp. 163-200.
- Cambridge dictionary.org Accessed 23 October 2023
- Campo, Angela( 2012) The reception of Eugen Wüster's work and the development of terminology. Doctoral thesis. Université de Montreal. Canada.
- Cillins.P.H (2005) " Dictionary of medical terms. London. A & C Black Publishers
- Collin, S.M.H (2004) "Dictionary of computing.London. Bloomsbury.

Dowding, K., Bosworth (2018), W. Ambiguity and vagueness in political terminology: On coding and referential imprecision, [sagepub.co.uk/journalsPermissions.nav](http://sagepub.co.uk/journalsPermissions.nav)

DOI: 10.1177/1474885118771256

- Graham Dziuban, C (2008) Blended learning environment, Retrieved from (PDF) Blended Learning Environments ([researchgate.net](http://researchgate.net))

- Khan, A. Shair (2016) . "The distinction between term and word: A problem for translators and interpreters and the role of teaching terminology". *Procedia - Social and Behavioural Sciences* 232 pp 696 - 704 doi: 10.1016/j.sbspro.2016.10.095

- Lage, M. J., Platt, G. J., & Treglia, M. (2000). Transforming the classroom: A gateway to creating an inclusive learning environment. *The Journal of Business Education*, 31, 30-43.

<http://dx.doi.org/10.2307/1183338>

- Saichaie, K.(2020), Flipped, and hybrid learning: definition, development, and directions, *New directions for teaching and learning* , no. 164, Winter 2020 © 2020 Wiley Periodicals LLC Published online in Wiley Online Library ([wileyonlinelibrary.com](http://wileyonlinelibrary.com)) · DOI: 10.1002/tl.20428

Seel, Norbert (2012), *Encyclopedia of the science of learning*, New York, Springer.

- Stadler, F.(2003) What is the Wiener Kreis? In: Stadler, F.(eds) *The Vienna Circle and Logical Empiricism*. Yearbook of the Vienna Circle Institute, vol. 10. Springer, Dordrecht [https://doi.org/10.1007/0-306-48214-2\\_1](https://doi.org/10.1007/0-306-48214-2_1)

[www.dictionary.org](http://www.dictionary.org)

- Tanton. P(1993) Translated by Tonkin, H & Al Esperanto, New York, State University of New York Press.

Vogel, R. Synonymy and polysemy in accounting terminology: the struggle to avoid inaccuracy. Microsoft Word - VogelRadek[1].doc (skase.sk)

- Guidelines for Open and Distance Learning for Adult and Adolescent Literacy Eradication 2021 by the UNESCO Institute for Lifelong Learning.

- Al-Aswad, Zahra. "Challenges of distance education and ways to overcome them". Arab Journal of Quality Education, Volume 5, Issue 17, 2021.

- Almaany Dictionary: [link](<https://www.almaany.com/ar/dict/ar-> ) Accessed 31 November 2023.