

A Corpus-based Cognitive Linguistic Analysis of Pre-existing Knowledge of Scientific Terminology: The Case of English *Energy* and Arabic طَاقَة (ṭāqa)

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Abstract

The present paper aims to broaden the current understanding of students' misconception of scientific terminology by identifying the gaps between Arabic and English scientific terminologies and between everyday language and scientific language. The paper compares the polysemy, prototypes, and motivating factors of English energy with those of Arabic طَاقَة (ṭāqa), with more focus on students' prior knowledge. The study employs Lakoff's (1987) idealized cognitive models and Rosch's (1975) prototype theory to reveal the radial members of both categories, i.e., *energy* and طَاقَة (ṭāqa), and to *explain* the kinds of cognitive mechanisms that motivate the extension as well as understanding of the meanings of these terms. To this end, the study uses several English and Arabic dictionaries, lexical databases and corpora. This is to explore all the meanings, prototypes and motivating factors of the terms under investigation. The results show that the terms *energy* and طَاقَة (ṭāqa) overlap in prototypical meanings and motivating factors but differ in less prototypical and peripheral meanings. English and Arabic learners may then face similar issues in learning scientific concepts due to the difference between their pre-existing knowledge and scientific language.

Keywords: conceptual metaphor, conceptualization, energy, polysemy, prototype

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