

A corpus-based analysis of educational curricula in the Arab States against European curricula and UNESCO benchmarks: Lexical networks and cognitive function of ICT terminology

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This research examines textual corpora of ICT terminology and concepts in the national educational curricula in the Arab world (referred to as Regional Corpus) versus European curricula (referred to as International Corpus). This contrastive approach allows us to outline extensive nomenclature of ICT in education in use over the last decade owing to the absence of standard definitions and indicators on the nature of ICTs integrated into and implemented in schools, despite efforts for standardisation. We focus on the curricula of ten Arab States that have policies, plans, and provisions to integrate ICT in education in general, and in First and Foreign Language Learning in particular, namely at the lower and upper secondary level of education in Lebanon, Jordan, Egypt, Qatar, Morocco, Palestine, Tunisia, Oman, United Arab Emirates, and Bahrain. By way of comparison, we observe their counterparts in European countries (including the UK). We also observe denotation-based definitions of ICT in education advocated by the UNESCO with the aim of developing a lexical network as well as highlighting the cognitive function of each.

To answer this question *Is the use and attitude to ICT uniform?*, we examine recurrent ICT terms in the Regional Corpus and the International Corpus. The frequency of a given term is defined as the sum of the frequencies of its morphological variants. This is to say, "competence" and "competencies" are referred to as two occurrences of the same term. As the patterns of word frequency in these two curricula do not entirely correspond, a "real" term (i.e. a word, a collocate, a word cluster or a multiword term) is considered familiar if it (co-)occurs ≥ 5 times in either curricula, with "at least one (co-)occurrence" (Leech et al. 2001) in one curriculum corresponding to one country. New terms familiar in either curricula (i.e. either corpora) are also extracted to emphasize the disparity of ICT terms in use. Besides, apparent incongruity between form and meaning between both curricula is included for contrastive purposes. Case-sensitivity is not taken into account. The citations are presented in a KWIC concordance format. Terms are classified by their thematic specificity, i.e. frequency in a given domain. They are extracted taking into consideration the notions of high unithood and high termhood as defined by Callon et al. (1986).

The emergence of word clusters like *digitally supportive student*, *digital native*, *digital immigrant*, *digital confidence*, *digital humanities*, *digital competence*, *digital skills*, *digital literacy skills*, etc. plus others like *computer literacy*, *ICT-assisted instruction*, *computer-assisted instruction* are not considered variants of the same concept. On the other hand, computing-related terms like *programming knowledge*, *coding knowledge*, *robotics*, *robotic knowledge*, etc. – more familiar in the International Corpus – are also considered thematically related to ICT. The domain ICT and its subdomains are outlined with the aim of creating lexical networks, and this includes:

- Lemma
- Main form
- Textual forms
- Occurrences
- Thematic specificity

To measure the compatibility degree of ICT terms in the two curricula, we first observe their frequency then we determine the semantic closeness/distance between clusters (Landauer et al. 1998). Second, we compare and contrast both curricula with UNESCOIBE Glossary of What Makes Quality Curriculum (2016) and Glossary of Curriculum Terminology (2013) as a “working reference” against which ICT capability can be assessed, knowing that the latter “is not (intended) to establish standard universally applicable definitions”. In this respect, in order to monitor polysemy, we consider higher-order thinking skills, a concept introduced in Bloom’s Taxonomy (1956) and later expanded to include the cognitive processes of analyzing, comparing, evaluating and creating (Anderson and Krathwohl 2001). In terms of the cognitive processes, we particularly investigate the extent to which ICT knowledge and skills included in the curricula incite higher-order and inventive thinking essential to enhancing students’ learning process (Kong et al. 2014).

We base our taxonomy of the cognitive domain on the theory of cognitive abilities proposed by Carroll (1993), structured into three-strata with different levels of breadth, moving from general to specific: Stratum three refers to general intelligence and it includes two sub-strata. Stratum two suggests eight cognitive abilities, and stratum one suggests a group of sixty-nine specific cognitive abilities underlying eight primary factors like language, reasoning, memory and learning, visual perception, auditory perception, idea production, cognitive speed, and knowledge and achievement. These abilities allow for further grouping as this model has been designed with this in mind, that is to say, to increase the validity and reliability of assessing (the subject’s) cognitive processes.

As a conclusion, based on the research findings, a more precise definition of ICT in its more precise or narrower sense is delineated, considering the differences in cognitive abilities required in the curricula of the Regional Corpus and the International Corpus.

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