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From AI Dependence to AI Literacy: Addressing Neural Machine Translation Biases in English-Arabic Digital Media Translation

Prof Dr. Brahim Machaal

Ibn Zohr University, Morocco

Abstract

This empirical study examines how 45 Moroccan undergraduate students use neural machine translation (NMT) systems when translating English digital media content into Modern Standard Arabic, revealing systematic patterns of uncritical AI adoption and technology-mediated errors. Through the analysis of 360 translations across eight digital media genres; namely, social media posts, streaming content, and mobile applications, we document that error patterns closely mirror documented NMT system biases. The errors are over-formalization (73% of translations), inappropriate literal transfer of cultural references (68%), and platform constraint violations (62%). Drawing on the PACTE translation competence model extended for AI-mediated contexts, findings demonstrate that students lack critical AI literacy necessary for evaluating machine translation output, particularly regarding NMT's systematic limitations in handling informal registers, cultural adaptation, and platform-specific conventions. Despite access to advanced AI translation tools (Google Translate, ChatGPT, DeepL), students demonstrate insufficient strategic competence to recognize when AI output is functionally inappropriate despite being grammatically correct. These findings have critical implications for translation pedagogy, suggesting that programs must shift from treating AI tools peripherally to integrating critical AI literacy, NMT bias awareness, and post-editing competencies as core curriculum components. We propose pedagogical frameworks emphasizing AI tool evaluation, understanding of training data biases, and development of human competencies that complement rather than compete with machine translation capabilities.

Keywords: Neural Machine Translation; AI Translation Tools; Translation Pedagogy; Error Analysis; English-Arabic Translation; Digital Media Localization