Chapter 10
The Wit-Learning Methodology as a Means for Research Skills Acquisition: A Longitudinal Assessment

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ABSTRACT

The present blistering modernization, epitomized by artificial intelligence, demands engineering graduates to address holistic, fast-changing, and even unknown problems. Thus, skills development, such as self-learning, is gaining importance against the traditional educational approach. To this regard, the wit-learning methodology was designed to stimulate the research skills during a course, supported on the similitude of the research endeavor with the desired engineers' profile. It stands out from other proposed alternatives targeting the students' capabilities that do not focus on research skills or misses their quantitative evaluation. In this chapter, the wit-learning methodology is presented together with its assessment regarding

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research skills acquisition, using direct and indirect measurements. Notably, it was verified to help improve the research skills through three criteria: the improvement of the students' research reports, the increased students' agreement to researchers while evaluating research reports, and their understanding of the research goals and processes.

INTRODUCTION

The rapid technological development and the accentuated availability of IT commodities shape an uncertain future. The versatility of artificial intelligence (AI) not only finds application in everyday services such as interaction in social networks and chatbots, it directly impacts the value chains of corporations and organizations and, in the end, is redefining the value of work of many people. In this way, the interaction of the AI in the individual life of a worker exhibits, in the words of Abeles (2016), even a threat to his identity and his sense of well-being. One might think that professional practice would be exempt from such a risk; however, applications of AI are present in areas related to high-level thinking such as learning, emotion evaluation, and disease detection (Wright & Schultz, 2018; Williams, 2019). That locates AI, according to the interpretation of Abeles (2016), as a competitive entity similar to a community capable of filling job vacancies traditionally occupied by the original population.

This panorama imposes new considerations on a sophisticated space of work opportunities *per se* and has motivated research regarding the incorporation of AI into professional practice. The consulted literature agrees that, although the AI is already modifying businesses, it has not conclusively affected the current work environment (Morikawa, 2017; Fountaine et al., 2019); however, a definitive growth is expected. In this sense, the current concerns about professions lie in their foreseen relevance and in the type of preparation necessary to face the future. In this regard, Wright & Schultz (2018) present a framework to identify the activities that most likely and promptly face an AI labor disruption. In that work, three axes with antipodal linguistic scales are identified, namely: (1) social or non-social, (2) skilled or unskilled and (3) non-routine or routine based. A routine based non-social activity that does not demand skill will, according to Wright & Schultz (2018), be more easily and promptly undertaken by AI.

Interestingly, the activities that are further away from such "absorption" are activities such as scientific practice and surgical care. It is foreseen that mid-level jobs will disappear, giving rise to specialized or low-level activities, focusing the latter