

From Theory to Tech: Developing a 21st-Century Employability Framework for Tunisian Construction Engineers

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ABSTRACT

This study investigates the long-standing employability gap among Tunisian civil engineering graduates, where mismatching between university education and construction industry demands irks labor market readiness. Through a mixed-methods approach, entailing semi-structured interviews with 25 industry leaders and action research within a leading Tunisian construction firm, this article reveals deficiencies in three domains: applied technical competencies, digital skills, and essential transversal skills. Findings show that employers refer to graduates' lack of proficiency in fundamental digital tools artificial intelligence (AI)-driven project management tools, and Computer-Aided Design (CAD)/ Computer-Aided Manufacturing (CAM) technologies. The novelty of this research is grounded in analyzing both current and future competence needs of the sector, particularly in response to ongoing technological transformation through continuous organizational feedback.

KEYWORDS

Employability Competences, Graduates, Construction Industry, Competences' Framework, Employers' Expectations

INTRODUCTION

Higher education students and their families, institutions, employers, and professional associations may have a number of expectations about earning a degree leading to an education and a clear career pathway (Olivier, 2020). A growing research gap has been pointed out within the existing literature on how teaching methods can effectively illustrate that the students themselves are actively engaged in the development of their employability competences (Cumming, 2010; Hadley, 2017 ; Tymon & Batistic, 2016). Despite the fact that significant research has been directed at the assurance of graduate outcomes, there is still little examination of the processes through which these skills and attributes are examined (Ferns, 2012).

Over the past two decades, Tunisia has faced the increasing challenge traditionally called the “employability gap among recent university graduates.” The “employability gap” may be regarded as a situation when, on one hand, most recent graduates experience difficulties finding suitable jobs according to their merits while, on the other hand, employers complain of a lack of candidates with required competences to fill announced vacancies. Although earning a university degree is a

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source of pride for the graduates, it does not promise jobs because there is usually a gap between the competences obtained by fresh graduates and the ones which are required within the job market. This gap has been one of the major concerns within Tunisia's national strategy for employment (Masmoudi & Ferchichi, 2024).

The mismatch between the availability of competences with the needs of the labor market can be supported by a set of factors such as limitation of access to quality education and training, limitation in entrepreneurship and innovation opportunities, a lack of articulation from the educational institutions with the employers' side, and also low investment in research and development activities (Ammari and Howe-Walsh, 2025). This misalliance in competences could only be directly addressed through a coordinated governmental, higher educational institutional, and private sector initiative for sustainable economic development of the country of Tunisia (Kthiri, 2019). This is more likely to cause unemployment for graduates without that alignment and finding a job that will actually match their competences with the needs of the market is not as easy as they may imagine.

This misalignment issue is highly dismissed in the Tunisian construction sector, despite of the prevalence of such industry (Boughzala, 2019). Substantially, construction industries take advantage of the benefits offered by information technologies with respect to effective data management, considering the huge amount of information that is foreseen to be exchanged throughout a project's life cycle. Indeed, the industry covers an extremely important part of infrastructure and industrial development within a country. In Tunisia, the building industry is of great importance. It is considered one of the primary sectors in the national economy since it has had a very positive effect on employment and improvement of living conditions for the entire population (Touati et al., 2018). However, construction firms usually experience an inability to find labor resources that will provide them with the level of competences needed in their operations (Boughzala, 2019).

As a result, most graduates of the Vocational, Education, and Training (VET) department, along with graduates from other higher learning institutions, lack some of the basic technical and soft skills such as basic literacy and communication skills (United Nations Children's Fund, 2020). The cause of skill and qualification mismatch within the labour market is partly because of the limited capacity of the VET and the higher education systems to align with the private sector's clearly defined and acute competences needs. Many of the curricula are outdated and learning institutions usually cannot prepare students with the technical knowhow, tools, and soft skills needed in the workplace, particularly in science, technology, engineering and mathematics (Boughzala, 2019). Indeed, this current examination is performed in light of the significance of employability competences in the current Tunisian building business domain and the need for accurate information about this topic. Indeed, to our knowledge, there are no studies that have addressed the employability competences required by employers in the construction and public works sector. Hence, the choice of this sector intrigued us because of its complexity and the overlap of its multiple stakeholders. In this regard, the work processes are highly correlated and the required profiles vary from the engineer to the executing builder.

This study is intended to obtain inclusive information about the employability competences required by Tunisian building business. The objectives of this study are (a) to investigate the employability competences gap for construction engineering graduates in Tunisia to establish the root causes of competence mismatch between the output of higher education and the labor market demand; (b) to analyze the current and future technical and employability competence needs of the Tunisian construction sector in the context of technological transformation and requirements for the 21st century; and (c) to develop a new framework of employability competences for Tunisian building business based on the 21st-century employment demands. This research contributes in formulating a policy for recruitment, training, assessment, and a general human resources development process. Moreover, our study comes up with an intelligible definition of employability competences to formulate an exhaustive conceptual framework.

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