



# Alignment of University Competencies With Global Skill Measures: Implications for Education 4.0 in Saudi Arabia as a Case Study

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## ABSTRACT

This study analysed two internationally recognised measurements of professional skills: the Programme for the International Assessment of Adult Competencies (PIAAC) and the Digital Competence Framework for Citizens (DigComp 2.2). This analysis aimed to establish a baseline and reference point for a comprehensive understanding of these two scales with the objective of exploring the most relevant competencies and assessing their potential benefits in fostering a technology-driven environment in higher education institutions in Saudi Arabia. The research yielded significant findings regarding the essential competencies that university students should possess, drawing insights from the two assessments and identifying gaps in existing manuals. The research outcomes include valuable insights and best practices that can empower a new generation of university learners to effectively engage with the requirements of Education 4.0.

## KEYWORDS

Competencies, DigComp 2.2, PIAAC, University Learners, University Manuals, Vision 2030

The exploration of widely used surveys and internationally recognized frameworks is crucial to help students as they develop the necessary cognitive and metacognitive skills and competencies to become lifelong learners. The surveys also demonstrate how students can be assessed and assisted at different experience levels. This research seeks to explore the interplay between the Programme for the International Assessment of Adult Competencies (PIAAC) and the Digital Competence Framework for Citizens (DigComp 2.2) to identify competencies recommended for learners at Saudi universities that will establish effective problem-solving skills in technology-rich environments. The PIAAC survey is used to analyze skills among adults at various locations, including in their homes,

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at work, and in the broader society (Organization for Economic Co-operation and Development [OECD], 2012). It was initiated by the OECD, which seeks to establish an overarching framework for international skills assessments in multiple countries. The international survey of 24 countries measures the key cognitive and workplace skills of adults aged 16 to 65 to explore how various skills are distributed, why skills are essential, and what factors relate to skill development. It assesses literacy, numeracy, problem-solving in technology-rich environments, and the ability to use information from texts. The United Nations Educational, Scientific, and Cultural Organization developed DigComp 2.2 (Carretero et al., 2017), which maps out four broad proficiency levels: foundation, intermediate, advanced, and highly specialized. It pays more attention to assessing digital competence and lifelong competencies for the learning environment, participation in society, and work activities. The framework includes 21 sub-competencies in five main categories: (a) knowledge about information, (b) communication and collaboration, (c) content creation (including programming), (d) safety (including digital well-being and cybersecurity), and (e) problem-solving and critical thinking.

The PIAAC survey and DigComp 2.2 are perceived as complementing, rather than contradicting, each other to provide more insights and details regarding the combination of knowledge, skills, and attitudes. In other words, they are composed of concepts and facts (i.e., knowledge), descriptions of skills (i.e., the ability to carry out processes), and attitudes (e.g., a disposition/mindset to act). They also represent a fair interaction between vital aspects of life (that is, between digital and non-digital competencies, e.g., between numeracy and cybersecurity). In the current research, the interaction between the PIAAC and DigComp 2.2 results in constructive outcomes regarding essential competencies of 21st-century university learners, and content and courses are suggested for further consideration to meet the needs of the labor market and increase employment opportunities. In addition, the two components strongly intersect with the objectives of Saudi Vision 2030 and its associated principles and initiatives, particularly the Human Capability Development Program (HCDP), as shown below. This research aims to thoroughly examine the development and assessment of digital and lifelong skills in Saudi Arabia, utilizing PIAAC and DigComp 2.2 as guides.

The goal is to identify effective methods for learners to track their progress regarding enhancement of key aspects of human capital within their local contexts. Therefore, this research attempts to answer the following research questions:

- RQ1). What competencies are recommended for learners to create effective problem-solving, technology-rich environments?
- RQ2). Based on PIAAC and DigComp 2.2, to what extent are digital skills and their associated competencies encountered by university students in Saudi Arabia for effective problem-solving in technology-rich environments?
- RQ3). What are the best practices related to the implementation of PIAAC and DigComp 2.2 in Saudi Arabia among university students?

## LITERATURE REVIEW

### The PIAAC and DigComp 2.2 Frameworks

This research considers two prominent components for measuring skills and digital capabilities among individuals. The first is the PIAAC framework, which encompasses collecting information from adults across three domains to report on educational achievement and work experience. The PIAAC framework has been used by individuals to reach desirable skills in numeracy and literacy (Rammstedt et al., 2017). According to Maslov and Zhong (2022), the comprehensive PIAAC survey provides policymakers with statistics related to education, training, and employment

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