

ABSTRACT

The construction industry remains a cornerstone and plays a leading in many national and global economies and contributes up to 10% of GDP in developed countries and more than 25 % in developing countries. In South Africa since 2008, the industry has been contributing an average of 9% of the total employment in both formal and informal sectors and around 9% towards the GDP. Despite playing such a significant role in the nation's economy, researches have shown that the industry is crippled with many challenges which amongst others include shortages of skilled personnel to do the work. The construction industry which oftentimes is used as a measure of a country's level of development, however, over the years it has failed to deliver as per expectations owing to these skills shortages. Previous researches on construction skills shortage have focused on education and training as a remedy but this has failed to yield the desired solutions as the skills shortages are still being felt despite heavy investments in education and training. A more radical approach is thus needed to overcome these challenges. This study is therefore conducted to evaluate the potential use of robotics, automation and artificial intelligence in addressing skills shortages in the South African construction industry.

In order to evaluate the potential use of automation and artificial intelligence in addressing skills shortages, there was a need to establish the records of the current skills shortage and the benefits of automation in overcoming such skills shortages. For this, meta-synthesis of existing literature was used for global skills shortages and the advantages of construction automation. To narrow down the issue of skills shortages specifically to the South African construction industry, five interviews were contacted to identify the enablers and threats for using construction automation in the country as well as the extent to which the use of such automation can affect the perceived labour intensive construction industry.

Results from this study shows that, despite the construction industry playing a significant role in many economies globally, there are damning results when it comes to skills shortage. With the advent of the 4th Industrial Revolution, the use of automation and artificial intelligence in the construction industry is the next big thing. The research concluded that, although construction automation and robotic technologies can be adopted and used, there should be compensation of the benefits accruing from the use of automation and artificial intelligence to offset the possibility of high levels of unemployment.

Keywords: *Construction Automation, Skill, Skills Shortages, Integration, Artificial Intelligence, Scarce Skills*