

## CHALLENGES OF 5.0 EDUCATION IN INDUSTRIAL ENGINEERING EDUCATION IN MEXICO

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### ABSTRACT

Globally, great economic efforts are being made to ensure that students are constantly updated to meet the challenges posed by new global trends to be effective and relevant in the global marketplace. Higher education institutions have much to contribute to the growth and development of society. Teachers as well as students are a central part of this formative process, since they must join the rest of the world in the use of ICTs to advance and survive in the 5.0 society.

**Keywords** - About five key words in alphabetical order, separated by comma

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### Dear Editor

Since 2020, the world has experienced the biggest health crisis in recent years, a disease caused by a coronavirus, which broke out in Wuhan (China) in December 2019, which quickly spread to many countries and, according to the World Health Organization (2020), evolved into a global pandemic [1]. No country was prepared for this medical emergency, which implied major changes mainly in the education sector. Mexico, as in other countries, opted for confinement, therefore the educational system had to adapt to these changes. Many higher education institutions closed their doors to implement a new teaching model in which they sought to take advantage of the use of technological tools to continue teaching classes to avoid falling behind in the educational objectives of each institution. Teachers left the traditional classroom to which they had been accustomed for decades, to become forced users of the technological tools that exist to interact remotely between themselves and their students, while having to deal with the personal pressures of confinement and its economic, health and emotional implications. Online education is a practical way of acquiring knowledge virtually by using platforms and tools or a combination of both to share and interact with different users for academic purposes. The return to academic activities

at the beginning of the year 2022, marks another stage of changes in higher education, after the use of digital teaching resources, the teacher and the student have tried to couple a new design in the way of strengthening the teaching-learning process, an example of this is the use of the inverted classroom in some cases continuing in the virtual or face-to-face. The following aspects should be considered to strengthen these aspects: accompaniment is essential; activities are the link in hybrid classes; gamification should be used; interaction is fundamental. Derived from the above, the challenges faced by engineering students with the transition to 5.0 education are mainly to reduce the collaborative gap between higher education institutions and industry to allow the development of real practices in the development of talent with cutting-edge technology. The competencies as well as the standards of the industrial engineering curriculum should be aligned with the current needs of industry, perhaps by modifying the evaluation items of the programs [2,3]. Adjust the educational methodology and focus it on learning by doing, as well as on project-based learning through real entrepreneurial experiences (Enactus program) and the modification of the teacher's role from guide to mentor or coach. The introduction of technology in higher education institutions in Mexico as an enabling and transforming tool for learning and its respective

evaluation. Complementary training for STEM (Science, Technology, Engineering and Mathematics) and technical profiles in skills such as digital business, creativity, innovation, communication, leadership, and teamwork. Based on the above, we can conclude that it is necessary to strengthen the profile of the industrial engineering graduate, since companies are in full digital transformation. Graduates must be continuously updated as companies seek to digitize themselves using big data, machine learning or artificial intelligence to be competitive, scalable, and profitable. There is still a lot of work to be done, the challenges are there to be faced and overcome, as the transformation must be led by talent.

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### **REFERENCES**

- [1]. K Manrique-Maldonado, G Arcos-Mastache, S Cabrera-Ríos, M Bonilla-Gómez. The pandemic and its impact in higher education. The use of technology by students of the Communication and Marketing Faculty from the UAGro. *Cuaderno de Pedagogía Universitaria*, 18 (5), 2021, 06-17.
- [2]. JO Okebiorum, OA Oyekan, KB Zacchaeus. Professionalism of Educators in the Era of Society 5.0: Lessons From Society 4.0. *Advances in Social Science, Education and Humanities Research*, 589, 2021, 156-60.
- [3]. DR Muzira, BM Bondai. Perception of Educators towards the Adoption of Education 5.0: A Case of a State University in Zimbabwe. *EAJESS*, 1(2), 2020, 43-53.