

A Key Competencies in The Industrial Age 4.0

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Abstract. The main problem in this article is the changing times and the phase of industrialization provides consideration in several fields of life. That change of time also has an impact on the way of life, shape of thinking, behavior, and human needs. In the industrial sector several key competencies are needed to meet those needs of community. This article is a literature review aimed at describing several key competencies needed in the industrial era 4.0. This article focuses on the grouping of key competencies in four major aspects items, namely, 1) personality competencies, 2) activities and actions competencies, 3) social communication competencies, and 4) technical and methodological competencies.

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INTRUDUCTION

Industry 4.0, lately has been crowded discussed. Because of impact 4.0 is the industry's era became most talked about. Depletion of and some work is often a topic of discussion. The replacement of the shopkeepers, to be displace digital guard by the toll booth as an example. Moreover, robot-controlled manufacturing jobs, are diminishing the physical store, the call center will be a record of the past as well as digital. All displaced in the industrial era 4.0. In essence, this type of work changed, (Kagermann, 2013).

Several factors led to the shift of the type of human occupation in between, available and cheap resources, dangerous and risky work of humans allowing replaced by technology. The radical change finally happens everywhere. Changes in types of work require changes in many areas of life.

Kohler (2016) describes some of the arguments that demonstrate of challenges have faced in the era of industry 4.0. Wolter identify industry challenges 4.0 as follows; 1) Problem information technology security; 2) the reliability and stability of the production machine; 3) lack of adequate skills; 4) resistance to change by the stakeholders; and 5) the loss of many jobs being lost in automation (Sung, 2017). Hecklau et al (2016) describes five industry challenge 4.0: 1) economic challenges, 2) social challenges, 3) technical challenges, 4) environmental challenges, 5) political challenges and rules.

Irianto (2017) simplifies the challenges of the industry 4.0 that is; 1) the readiness of the industrial; 2) labour reliable; 3) ease of socio-cultural settings; and 4) diversification and job creation and industrial opportunities 4.0, namely; 1) innovation ecosystem; 2) competitive industrial base; 3) investments in technology; and 4) the integration of small and medium enterprises and entrepreneurship.

The challenge of the industry 4.0 need answers fast and responsive. The response was in the form of changes in various areas of human life. These changes were primarily in the aspect of human resource development. Institutions have an important role to make changes to produce quality human resources. Qualified human resources referred to in the industry 4.0 is a master of human resources needs 4.0 era. 4.0 based industry needs some key competencies required to answer fast-paced change.

LITERATURE REVIEW

Key Competencies

Human resources generated by universities must have at least four skills. Four skills to be forged in accordance with the demands of the media industry 4.0 i.e. skills and information, life skills and career, learning and innovation skills, and ability to communicate effectively.

Media skills and media literacy load information, visual literacy, multicultural literacy, global awareness and technology literacy (Liffler, 2013). Life skills and career includes

leadership, responsibility, ethical values, moral values, productivity, accountability, flexibility, adaptability, social and cross-cultural understanding, initiative and self-guidance.

Learning and innovation skills include, complex problem solving, creativity, curiosity and risk-taking. Effective communication skills include teamwork and collaboration, personal and social responsibility, interactive communications, and national and global orientation.

Abele, Metternich, and Tisch (2019) describes four types of competencies needed in the era of industry 4.0 and in the future, namely 1) personality competencies, 2) activities and actions competencies, 3) social communication competencies, and 4) technical and methodological competencies. In detail, the four competencies it can be described as follows:

Table 1. Four competence of the future

Competence	Explanation
social communication	Ability to communicate and create organizational actions
Technical and methodological	Mental and physical abilities to organize actions in resolving technical issues
Personality	The ability to organize personality in the organization
Activities and actions	The ability to act in a holistic

Four basic competence delivered Abele, Metternich, and Tisch each have sub-competencies a must-have. In detail, Abele, Metternich, and Tisch (2019) outlines four sub-competencies as follows:

Table 2. Future Sub-Competencies

Competence	Sub-Competence
social communication	Ability to communicate Ability cooperative Relationship management Adaptability
Technical and methodological	Expert knowledge Behavior plan Market knowledge Interdisciplinary knowledge
Personality	Loyalty Credibility Ethical attitude and normative
Activities and actions	Autonomy Mobility initiative

Competence	Sub-Competence
	Energy Attitude to act or execute

Not just master the competencies and existing sub-competencies interact to form a skill that must be mastered in industry 4.0. Sub-competencies interaction and will give birth to a new sub-competency. Some simulations sub-competencies be as follows; First, the interaction of social competence with the technical competence will bring sub-competencies just like, articulanness, sense of duty, understands perspective others, preciseness, project management, ability to lecture awareness of results, and professional regulation. Second, interaction between social competence with the competence activities and action raises new sub-competencies namely; acquisition skills, willingness to experiment, ability to solve problems, ability to advise others, optimism, inspiring others, social commitment, and a ready wit.

Third, the interaction between social competence with personalities that bring new competencies mastery; ability to solve conflict, ability to working a team, ability to integrate one self, ability costumer orientation dialogue, humor, personal development, helpfulness, delegating. Fourth, the interaction between technical and methodological competence with personality competence bring new sub-competencies i.e., focus on knowledge, objectiveness, analytical skills, ability to assess things, readiness to learn, discipline, holistic thinking, and reliability. Fifth, the interaction between technical competence and methodological with competence activities and actions that bring new sub-competencies, conception strength, diligence, organizational skills, systematical, methodological proceedings, acting with the resulting mind, persistence, leading with the targets in mind, and consequence. Sixth, the interaction between personal competence activities and actions led to new sub-competencies namely, readiness for action, creative skills, self-management, openness to changes, decision making ability, ability to try new things, creative drive, and the ability to with stand the stress.

Interconnection of these competencies is also corroborated by the opinion Irianto (2017). Iriato describes the ten-competencies required, namely, 1) solving complex problems; 2) cooperation with others; 3) the management of people; 4) critical thinking; 5) negotiations; 6) quality control; 7) the service orientation; 8) assessment and decision making; 9) active listening; and 10); creativity. In 2020 turned into a working structure; 1) solving complex problems; 2) critical thinking; 3) creativity; 4) management of people; 5) cooperation with others 6) emotional intelligence; 7) assessment and decision making; 8) the service orientation; 9) negotiations; and 10) cognitive flexibility.

From some of the skills needed, clearly defined position as organizer of educational Institutions. Educational institutions are not only required to hone hard skills but its main role is more on instilling a comprehensive soft skill. Even in general terms, educational institutions must be oriented to multi-skill multi-culture. World Bank

(2017) reported that the labour market requires multi-skills graduates forged by the unit and the educational system, both secondary education and higher education.

All the elements that exist in educational institutions should be directed at achieving the four skills. Educators, curriculum, facilities and infrastructure should come support. One of the elements that affect the achievement of the skills are educators. Educators personnel must have flexibility. Educators must adapt to the conditions of the times though born as a digital immigrant.

New learning

If you cannot adjust the education power did not rule out the same fate as some jobs began shifting to the presence of the all-powerful technology. Educators should strive learning redesign. Trilling (2009) explain that, learning to shift from rule (pattern) to the old rules (patterns). Learning the new rules contain a few things.

First, one can consider the needs of his career. This means that the duty of an educator is to provide and describe a lot of career choices. Not limited to the mastery of science in disciplines that they do or "skill plus". In some perspective is often termed skill plus. Especially about the science that media intermediary sales and digital information technology.

Secondly, educators should lead the student to learn all the time. Learning is no longer just in the classroom, but also in learning self-designed micro and the group made its own. If the surgery then learning all the time in college is not just the responsibility of educators but also the commitment of interest groups including learners. In this process, the task force educator much helped by the role of technology. The majority of digital native learners are born in the era of technology has flourished. They are a people who are diligent surfing the internet through social networking. Information of the millennial abundance. Only they are often misled by the use of technology has not been. This is where the role of educators and not just creating a learning all the time but also design a study guide at all times so that students learn systematically through technology. Everywhere, long-time learning.

From the second assumption, the next challenge is to utilize educational institutions of learning technology capable of creating a learning experience that is active and collaborative. This is important for several reasons show that technology tends to make people become selfistic, less able to collaborate and work together. Selfisme human technology products would be so threatening educational institutions.

From this phenomenon, the biggest challenge faced by the institution is to maintain confidence (trust) in order to stay alive expertise. In the digital era, it takes an adjustment by adding electronic understanding after mastering the field of science. By several sources termed "Electronics Expertise". Electronic expertise here that can foster confidence in the educational institutions in the digital age.

CONCLUSION

Based on several studies literature, it can be concluded some key and important competencies needed in the era of industry 4.0. Four competence it is items, namely, 1) personality competencies, 2) activities and actions competencies, 3) social communication competencies, and 4) technical and methodological competencies. The fourth key competencies needed 21st century must be integrated into a new learning process in education institutions.

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