INDUSTRY 4.0: ARE WE READY
(Agora/workshop)

Report

Setting the theme

The agora consisted of two parts: introduction/setting the theme (Luca Boetti, IT) and an interactive part (Iñigo Araiztegui, Basque Country, ES), which aimed at gathering the participants' views on the problems raised to the VET sector by Industry 4.0 and possible suggestions for solutions from the education and training providers' perspective at the grass – root level. For this purpose the participants formed smaller groups for discussions, elaboration of common position and presentation.

There is no doubt that Industry 4.0 revolution is already in place, speeding up changes and affecting all spheres of life. Some of them have naturally become part of our lives, and we use them without deliberately considering and contemplating the change. The moderator gave numerous examples of the swift shift of technologies during the last decade (e.g. from traditional phones to communication via social media; from mechanical tools in industry to computers and robotics in all cycles of production; from traditional medicine to virtual reality and IT in training and performing most complicated surgeries). The production systems have shifted from rigidly sequenced production line to decoupled, fully flexible and highly integrated manufacturing systems. Due to Industry 4.0 revolution, cyber-physical systems step on the scene, covering even more areas, such as cyber security, robotics, big data analysis, augmented reality, additive manufacturing, etc.

All these changes have resulted in change of paradigm not only in industry, but in societal spheres as well. Hence we are talking not only about Industry 4.0, but also about enterprise 4.0 and society 4.0.

All this is correlates directly with education and VET in particular: how to meet and satisfy the demands of the volatile markets? Changes in paradigm in education and relations between three key players' domains: teachers/trainers- students-industry.

Key questions in the workshop

Three key questions were prepared by the moderator on which the participants were invited to focus during the interactive discussion:
1. What is the role of VET with regard to Industry 4.0?
2. What are the obstacles for VET providers, that hindrance/slow down being ready for Industry 4.0? What are possible solutions?
3. What are the needs of VET providers, in order to get/keep ready for Industry 4.0?

The composition of the participants

The participants of the workshop represented the diversity of EfVET members regarding geographical, size, national and systemic perspectives, e.g. participants from the NL, DK, ES, LT, PL, DE, FI, IT, EL, etc.
This wide covering of the VET domain across Europe suggests representation of the diverse views and the problems of the VET within EfVET membership and outside.

Results of the discussion

It is obvious that VET sector can't respond to the issues of impact and challenges of Industry 4.0 in an excluded manner, or without macro perspective, and cross-sectorial analysis, because, according to Granovetter (1985) e.g. in European tradition (stemming from Max Weber) "economic action is seen only as a special, if important, category of social action", economic prosperity is no longer possible without regard to macro phenomena and societal objectives. (J. Vveinhardt, R. Zygmantaite, 2015)

The participants of the workshop in both- morning and afternoon sessions, were split into 5 teams to work on the key issues and to formulate suggestions, on how VET sector can best react to the challenges of Industry 4.0. At the end of the workshop all suggestions were amalgamated to form a portfolio of problems/obstacles and a portfolio of suggestions/solutions.

Portfolio of obstacles

The underpinning idea for the whole portfolio of problems is "Disconnection".

1. Outdated curricula. The fact that this issue was put in the first place by all participants suggests high relevance of the problem in all countries of the EU. Since the focus was on Industry 4.0 technological professions were in focus. However, other fields complained about curricula, lagging behind the needs of the world of action. This problem strongly influences employability of the graduates and lack of dialogue with the sectorial players in the field. It seems the dichotomy and misbalances are the outcomes of the curricula mismatch. The level may differ by country and by sector, however this was reported and agreed on by most participants.

2. Lack of freedom in curricula design. The correlation between the two problematic areas, leading the list, is obvious. The bureaucracy and the time for registering the course is an obstruction to teachers' motivation for innovation. In all countries too strict framework from the ministries on curricula design has been reported. The schools want and seem to be ready to take more responsibility and also receive more freedom in curricula design.

3. Competencies of teachers. The problem of teachers' competencies in the field of technologies and is underpinning and has been reported even in most innovative and industrially developed areas. The barrier in using foreign languages is always a big barrier for progress. Such teachers are not able to participate in teachers' mobility abroad and can't read the newest scientific literature on technologies. However, teachers and trainers (at school) competencies can be successfully developed in home country given sufficient degree of collaboration between companies and VET sector. With some companies, cutting numbers of apprenticeships (due to plenty of diverse reasons and influencing factors), teachers at dual and school-based model must be equipped with relevant knowledge on modern technologies.

4. Divided responsibilities don't ensure holistic approach to education. This is especially relevant to apprenticeship type of training. Lack of stress on

transversal skills and societal values consequently create problems for society in the long term and prevent from consistent development of student personality.

5. Lack of dialogues with companies result in mismatch of skills, the outdated curricula, disengagement of teachers in all cycles of the training process, prevents from teachers participation in continuous DPC.

6. Old laboratories and other equipment in schools are a result of insufficient funding from the governments and lack of focus on VET in general.

7. Cyber security related issues prevent from obtaining some relevant software, necessary for educational purposes. This is specific to technological professions.

8. Time is what teachers don't have! The timetable of a VET teacher is stuffed paperwork and reports. There is not enough time to engage with students in project and for self – development.

| Portfolio of solutions |

The all suggestions and ideas of the solutions' portfolio can be encapsulated in one short title- co-creation.

Taking an institutional perspective on Industry 4.0 related innovations in VET sector suggested a range of interesting possible answers to the key questions of the workshop. It is obvious that innovation- be it sectorial, sociatal or institutional- refers to the process of developing and implementing novel solutions to arising problems, often involving re-negotiations of settled institutions among diverse actors with conflicting logics. As such, in many cases but not always, innovation entails taking measures, that won't be acceptable for all. However, changes are urgently needed as we confront situations which in themselves bear an irrevicable character. Moreover, they feature substantial interdependencies among multiple systems and actors, and have redistributive implications for entrenched interests.

The discussants, showed a good amount of positive attitude and elaborated a portfolio of suggestions. The workshops listed numerous ways for improvement and development, and the shared ideas were classified into 8 broad sections:

1. Freedom in curriculum design.
2. Dialogues with companies
3. Shared responsibility
4. Shared ownership
5. Traineeship for teachers in companies
6. International mobility for teachers
7. Life skills for students and graduates vs job skills
8. Hybrid teacher, mastering new tools and technologies, a good pedagogue, a mentor and advisor, leading a student though all cycles of his education and at the start of her/his career. Universities and other HE insitutions should develop courses not only for pedagogical competencies, but for deepening and updating technological knowledge of teachers as well.

The all suggestions and ideas of the solutions' portfolio can be encapsulated in one short title- co-creation. This implies all stakeholders, from schools, administration, teachers and parents to businesses, governments, and wide range of insitutions in society, However, this spectrum of stakeholders has existed in all times, whereas at this stage innovation are mostly imposed by changes in businesses. Hence, all agreed that in many cases, more efforts are needed from both sides (VET-business) to come to consolidated conclusions. CSR of companies, as contribution to education shall bring positive impact on society and consequently to their institutional goals/profits. Many researchers maintain (e.g. Okereke, Wittneben & Bowen, 2012; Porter & Kramer, 2006; Schrempf, 2014) that businesses themselves can have both positive and negative effects on social and environmental outcomes (Okereke, Wittneben & Bowen, 2012; Porter & Kramer, 2006; Schrempf, 2014). Businesses, through operational externalities and efforts to increase profits, both cause societal harms and sometimes contribute significantly to the maintenance or even worsening of arrangements which perpetuate those harms, often through subtle or overt exercise of market or political power (Barley, 2007; Levy & Kaplan, 2008). Yet businesses can also ameliorate societal harms by changing practices or contributing to solutions through corporate social responsibility, opportunity-driven innovation and philanthropy (Egri & Ralston, 2008; Matten & Crane, 2005; O'Toole & Vogel, 2011; Reficco & Marquez, 2012; Spar & La Mure, 2003).

Great expectations of VET providers are associated with the new funding period, which shoudl simplify bureaucratic procedures of KA1 project application for VET (as opposed to HE institutions, which merely fill in data, related to students numbers etc.) and could foster teaher/trainer engagement in international mobility.

Rasa Zygmantaite,
Marijampole UAS/Kolegija
Deputy Director, Marijampole, Lithuania
EfVET Scretary

Moderators: Luca Boetti – IFOA, Italy ● Iñigo Araiztegui – TKNIKA, Basque Country, ES

Rapporteur: Rasa Zygmantaite, Lithuania