Inside this issue...

Welcome message by EfVET President ................................................................. 1

Interview to TT coordinator... Kari Puumalainen ....................................................... 3

POLICY

EfVET goes global: EduRussia2019 ........................................................................ 5
ET 2020 WG: Innovation & Digitalisation ............................................................ 6
Master of Digitals: #AStrongerDigitalEurope ..................................................... 8
EU Industry Days ................................................................................................... 9

FOCUS: Technologies & Industry 4.0

Changing world and a rapidly evolving technology, the challenge for Vocational Education by Kari Puumalainen ................................................................. 10
Knowledge management in decision making of VET by PhD Jukka Soininen, TCD Consulting and Research Oy ................................................................. 11

BEST PRACTICES

Italian Industry 4.0: Tech Day, Apro Formazione ................................................ 12
The digital transformation of Industry, Politeknika Ikastegia Txorierri .............. 14
The Italian Dual System: Results and perspectives, SCF .................................. 15
Industry 4.0. Linking VET and enterprise to progress towards the industry of the future, HETEL ................................................................. 16
Drives project: Annual meeting, Drives project team ........................................ 18
Third Edition of e-MOTIVE, HETEL .................................................................... 19
Drone European Platform, CECE ........................................................................ 19
DC4Work and Digital Tourism, EfVET .............................................................. 20

WELCOME TO NEW MEMBERS ........................................................................... 21

EfVET ANNOUNCEMENTS .................................................................................... 22

RESOURCES T&I 4.0 ............................................................................................... 22
Welcome by EfVET President

Joachim James Calleja

Challenging times ahead

EfVET is in a phase of transformation. In Como, we presented a first draft of the Strategic Plan 2019-2022 which highlighted seven major directions that we could take to make the organisation a stronger voice for VET in Europe. We pledged to (i) build capacity and the delivery of high quality services to our members; (ii) to support fully functional EfVET National Boards; (iii) to aspire to become leaders in advocacy for VET enterprise in Europe; (iv) to act as catalysts for VET reform in Europe; (v) to be key promoters of work-based learning and community curricula in VET provision and finally (vi) to be shareholders with industry and governments in order to promote investment in digital-based learning environments and finally (vii) to widen membership of EfVET and become leaders of a European Confederation of VET Providers.

After a long period of consultation, I am happy to report that the strategic plan was approved at a joint Executive Board and Steering Committee meeting held in Malta in January and will soon be available electronically and in paper format to all members and other stakeholders. A strategic plan requires implementation. In our meeting in Malta, we agreed that we need to recruit a Programme Manager to implement the strategy from our Office in Brussels interacting with as many members as possible and engaging members and stakeholders in our effort to make VET a much more respectable sector in education. A Call has been issued Europe-wide and we hope that we will attract the talent we need to complement the already capable staff that we have at EfVET who within the limited financial resources that we possess have made a reasonable positive impact on the Organisation. Implementing a strategy is a challenging phase in the development of EfVET. But in a world which is becoming increasingly complex and challenging, we stand no other option. We either grow qualitatively as an Organisation or we perish. EfVET is a hybrid between research, networking, advocacy and policy recommendation for European VET. As training providers, we can freely say that we possess the real knowledge of VET and that we ourselves are the main catalysts for change and reform in vocational education and training.

We also pledged to work harder, smarter and dream big!

As we operate at the European level, we are also anchored through our National Committees and the hundreds of members spread all over Europe to micro contexts in which education and training take place and interacts with industry and the world of employment.

Robots, Human Capital and Digital Learning
Managing transition and inclusion

As the latter is changing at an accelerated pace, we decided that the next annual Conference in the Azores, Portugal will be focused on the theme Robots, Human Capital and Digital Learning, Managing transition and inclusion. The conference will address a number of questions that arise from the impact of technology on learning and working. Robots today are already capable of designing programmes, writing, speaking, walking, cooking, preparing drinks, navigating cars, ships, airplanes and a million other activities! Will they be able to take all our routine jobs? Will we be able to cope with and tolerate their artificial intelligence? Will employers invest in robots or in skilling, upskilling and reskilling of their human capital? If cost-effectiveness is an indicator to go by, then in several jobs’ robots are cheaper, ‘loyal’ servants and hard-working, efficient and highly productive. How will this phenomenon impact on vocational education and training? No matter how hard it is to imagine such a situation in workplaces or in learning institutions, the truth is that technology, robotics, artificial intelligence and the internet of things are presenting several challenges to human beings particularly those in charge of skilling young people. The rapport between robots, human beings and vocational education is imminent and perplexing.
In this scenario, EfVET wishes to challenge its members by presenting the reality outside its traditional confines of the educational discourse that has taken place over the last twenty years.

By associating robots with human beings and vocational education, the scope of this conference is to reflect on how VET universities, colleges and schools can manage the necessary transition from school-based to reality-based learning. In this context, the borders of our VET institutions will be challenged by the advancements that are taking place in workplaces. Teachers will be challenged by the knowledge and the foresight of employers and high-tech employees. Policy-makers will find their action as too slow and financially too little to be relevant to the labour market of today, let alone that of tomorrow.

This conference will explore what roadmap vocational education leaders, managers and practitioners must design to enable them to lead, manage and practice education and training that matches as close as possible the world of work. Furthermore, beyond the conventional pleas for quality, transparency, mobility, permeability, inclusion and recognition of qualifications lies the challenge of relevance and effectiveness. A further challenge is to speed up reform, the image of VET and transform talking into action! This conference aims at establishing a new paradigm shift that could take vocational education to its next level of excellence based on targeted action, systemic implementation and targeted impact. I hope that you will enrol as early as possible. We are bringing together a number of distinguished speakers from outside E&T to challenge our mind-set and to engage in a dialogue with our experience in the world of education. Your early booking will guarantee your place at this unique conference in which the world of E&T will be mingled with that of the future of work.

I look forward to seeing many of our members in Ponta Delgada, Azores (Portugal) on 23-25 October 2019.
Technologies and Industry 4.0 Thematic Team looks at the changing world and vocational education. EFVET speaks with Kari Puumalainen, one of its Coordinators. Kari Puumalainen is the Finnish representative in the EFVET Steering Committee since October 2016. Director of Ylä-Savo Municipal Federation of Education and also the principal of Ylä-Savo Vocational College, he coordinates the work of EFVET Technologies and Industry 4.0 (I&T4.0) Thematic Team.

Why “Technologies and Industry 4.0” has become a top priority for Vocational Colleges?
K. Puumalainen (KP): The basic task of vocational training is to train professionals for the needs of working life. When the working life changes rapidly, the teaching and the educational institution must also keep up with the change. The very rapid development of new technology is changing the world as much and as irreversibly as the time of the invention of a steam engine and electricity.

What is the main objective of the I&T4.0 Thematic Team?
KP: After the discussion during EFVET Conference 2018, we have set up the main objective of the TT. Therefore, the main objective is modelling the Vocational College 4.0 and building up the professional European network to support the development of vocational education.

This is a quite extensive goal, are you thinking to divide the TT group into different subgroups?
KP: While analysing the TT objective, indeed we realize that is quite a broader topic that’s why we decide to divide the work into 6 specific subgroups such as: Knowledge management in vocational education, Up-skilling (new tasks, new tools, new organization systems, new communication) and re-skilling of workers (professions which disappear, new professions, Technological changes in teaching, Transference of what is happening in companies to the students, Inter-disciplinary competences or quality of trainers. These are a few proposals but when we will start to divide the work we will see if some more is needed. Besides, we envisaged working closely with other TT, especially with “Technologies a Learning and Teaching” lead by Tibor Dori and Fernanda Torres.

What are the main priorities?
KP: First and most, to reach a common definition and understating of what T&I 4.0 means. Secondly, to measure the impact and how it will change Vocational Education, we need to comprehend the demands from VET schools to align to T&I 4.0.

How the TT will work to support EFVET Members?
KP: We expect to cooperate in national and European level, but also to share the acquire knowledge via this particular TT and present the lessons learned during EFVET Conference 2019.
**What are the expected possible actions from T&I 4.0 Thematic Team?**

**KP:** It's something to be decided with the rest of the group's members, but we are expecting to develop common projects, produced materials for colleges on the utilization and meaning of T&I 4.0 in vocational education, organise some national or European workshops and, we are thinking about study visit to colleges and companies that are already advanced in the utilisation of new technologies in vocational education.

**What potential stakeholders are you thinking to collaborate with?**

**KP:** Companies using new technology, universities/polytechnic studying and developing new technologies, national authorities and, last but not less, colleges, the persons who are teaching, developing and studying T&I 4.0, who can represent an example for other EFVET Members.

**In which phase of work is TT involved right now? Is still open for new members?**

**KP:** The work plan for the theme group for 2019 has just been approved and the actual work is underway. More members from different member communities and their partners are welcome to the theme group.

---

**Understanding T &I 4.0**

**VET Schools and T &I 4.0**

**Building up a professional European network**

---

If you would like to join the TT, please write an email to Alicia Gaban (ag@efvet.org)
The President and Vice President of EfVET, James Calleja and Stefano Tirati, together with EfVET members, Olga Oleynikova (Centre for VET Studies, Russia) and Mari Kontturi (Luovi Vocational College, Finland) participated in the EDU RUSSIA 2019 “Global Competitiveness through Education” international conference focusing on Higher Education and VET. The conference was held in Kazan, the capital city of the Republic of Tatarstan, from 28th of February to 1st of March.

Over 4000 participants ranging from federal government officials, regional authorities, educational managers, teachers and trainers have participated at EDU RUSSIA 2019. The conference has taken place within the same outstanding facilities which will host, in a few months, the WorldSkills Kazan 2019.

EfVET as a global VET reference

The President of EfVET, James Calleja, shared his views and insights on the future of education. In his presentation, he stressed that human capital and machines will not be adverse partners but complement each other for effective competitiveness. Technology has been the driving force in the progression of human civilization for more than a hundred years. There are misconceptions about robots stealing people’s jobs. It is true that millions of jobs will be lost through technology but equally correct is the statement that millions more will be created.

“Because humans can think and act flexibly, they are often better problem solvers”, Prof James Calleja

Mr Calleja said that “because humans can think and act flexibly, they are often better problem solvers”. However, one cannot ignore the fact that algorithms are also solving problems and reasoning tasks better than human beings.

In this scenario education and in particular vocational education and training plays a central role in providing the bridge between the world of education and the world of work. All forms of work-based learning but particularly apprenticeship programmes support the complementarity that should exist between human being and robots, between creativity and automation.

Mr Calleja emphasized that over the last two decades a large amount of data has been gathered in practically all sectors; computer power doubled over the last ten years; internationalization has become a national priority and hence working and learning in different contexts will help future workers achieve adaptability and flexibility. Education plays a central role in providing in early years the so-called 21st-century skills built on foundational literacies, competencies and character qualities. However, neither education nor businesses can work in isolation. If countries aspire to become competitive, the world must come together; teachers, employers, workers and learners should be partners in a combined world of lifelong learning and working; employers and businesses cannot claim to be stakeholders in education anymore but shareholders of a continuum process of permanent education and training. Both education and businesses are facing steep challenges. While businesses are being constantly challenged by artificial intelligence, education is constantly threatened by obsolescence. In this respect education and training programmes must be regularly updated and teachers and employers share roles as much as possible.
Concluding, the President of EfVET stressed that while artificial intelligence is influencing the whole of society and in particular sectors such as healthcare, legal systems, financial services, agribusiness, transportation, gaming and sports among others, education and training is also going through a renaissance of vocational education. This is important, in Mr Calleja’s words, “technology is the new language of human development and the rapport between humans and robots will eventually serve to make humans more creative intuitive humans and robots more mechanical servants for competitiveness and of social well-being”. Education and training are challenged by this new era of innovation and change.

Stefano Tirati focused the reflection on the changes in the labour market related to artificial intelligence and digitalization and their impact on the educational system, in terms of learning spaces, initial and continuous professional development of teachers and trainers, learners and learning processes. Some practical examples of how education can go digital have been presented, including the SELFIE tool and the forthcoming localized version for VET.

Mari Kontturi introduced the key principles and main benefits of internationalization in VET, presenting the Finnish system and the European and national support measures, as well as highlighting the practical steps to be taken to establish transnational cooperation.

The session on the 28 of February, facilitated by Olga Oleynikova who introduced the key pillars of transnational cooperation in education of the Russian Federation, have seen the contribution also of Franca Crestani, specialist of VET policies and systems at European Training Foundation, who explained the progress made with regards to the Torino Process.

What’s next?

As a result, EFVT is pervaded by an even stronger commitment to foster cooperation and bridges between European and Russian VET providers, via EfVET Study Visits and Thematic Teams and by ensuring participation at high-level events, such as EfVET Conference or WorldSkills Kazan 2019.
The first meeting of the ET2020 Working Group took place in Brussels on the 24th and 25th of January in the European Union Science and Innovation Building. 42 experts from all over Europe participated in this meeting and worked together in order to establish the next steps of the Working Group until the end of 2020. EFVET was represented by Panagiotis G. Anastassopoulos as an expert in the sector.

What is this group about?

The digital era is already in the past, now we have moved to the digital twin era. This inevitably brings training in using digital tools in its everyday routine and the efficiency of this use is critical. In VET we have the opportunity of being flexible and use all the means that are efficient to our trainers, but is this good enough? The big question to be answered is the efficiency of this flexibility along with the centralized systems per country, let alone the great differences between them. The ET2020 Working Group on Innovation and Digitalisation tries to bring answers on questions such as:

- How can innovation and digitalization support higher quality VET and higher VET in contributing to innovation and digitalization in the economy?
- How should we approach differences in pedagogical and andragogic methodologies today?
- What are the governance and financing frameworks for the changes in the new era?
- How the needed quality will be guaranteed?

And many more that are relevant to this fast change we experience in the connected worlds of work and education...

The meeting was opened with the keynote speech of João Santos, Deputy Head of Unit E3 (VET, Apprenticeships, Adult Learning), Directorate General for Employment, Social Affairs and Inclusion (DG EMPL), speaking about the difference of the change in the past and the present. “It is not that in the past we did not have changes. In fact, we had almost the same, but they were taking place at a pace that the educational system could adopt. Nowadays the pace of change is so fast, that it is really a big question how we can adapt ourselves to this pace”.

The approach of Centres of Vocational Excellence is a suitable example of how this could be answered by the good examples of applied methodologies.

Then the panel moved to John Edwards, Research Manager, Joint Research Centre (JRC), who analysed the S3 (Smart Specialization Strategies) at Regional level, which are so interconnected with VET that Regional Skills Councils will soon be created in every EU Region that follows S3. The sectors of the S3 and the tactics described are very similar to our new established Thematic Teams, so EFVET could be a really effective mediator for this.

The delegates of the Group then worked in smaller teams designing and commenting on the Clusters to be followed until 2020 so as the interim and final products of the ET2020 WG will be as simple and practical as possible.

A great analysis of the SELFIE project and its feasibility was presented by Ralph Hippe, Scientific Officer, Joint Research Centre (JRC) and Bert-Jan Buiskool, Senior Consultant and Managing Partner, Ockham IPS, regarding the huge acceptance of this tool across EU training providers. It is a really good example of how the questions risen nowadays due to this pace of changes could be answered.

Next steps

The success of this first Working Group glances to the eagerness of the members to host the next meetings. This led to the establishment of the agenda with specific places to meet until 2020 (and specific dates for 2019 and approximate ones for 2020). Next Stop Timisoara at 21 and 22 February, so stay tuned....
Focus: Technologies and Industry 4.0

On the 21st February took place the “Masters of Digital 2019” event organized by DIGITALEUROPE. It is the largest policy conference focusing on the digital sector in Brussels and it gathered together experts from diverse sectors to discuss topics such as manufacturing 4.0, digital sustainability, artificial intelligence and EU’s Digital Leadership beyond 2020.

‘We must build on Europe’s strengths, starting with education and lifelong learning.’

EU Commissioner Mariya Gabriel opened the event focusing her intervention on the need to construct a human-centred digital society, starting with education and lifelong learning in order to shape and frame innovation. Europe is lagging behind in digital innovation and needs to urgently catch-up and build on digital skills. The world of tomorrow will belong to those able to scale and we have to build on Europe’s strengths: people, diversity, industry, education. This requires us to bridge the gaps in investment in R&D.

How is Europe growing with digital?

The debate was moderated by Cecilia Bonefeld-Dahl and included Olaf Koch (CEO Metro), Harald Gruber (Head of Digital Infrastructure Division, Projects Directorate, EIB), Lie Junius (Director Public Policy and Government Relations, Google EU) and one of the winners of the Future Unicorn Award 2019, Niels Hartvig (Founder of Umbraco) as speakers. Olaf Koch stressed the importance of revitalising growth by acting local. Metro serves 24 million customers in the hospitality sector and strongly believes in empowering communities through digital. Harald Gruber gave a financial approach: ‘money is a solution but it is not the solution’. We need financial instruments to attract investors and allow funding and incentives to encourage SMEs to follow the path of digitalisation. Lie Junius highlighted the need to address the skill gap as technology has a huge impact on society. Niels Hartvig acknowledged that even though Europe needs to catch-up on digitalisation, we have a huge potential.

How Europe can take global leadership in digital manufacturing?

Dieter Wegener (Vice-President, Siemens) gave insights on the manufacturing industry in Europe; we are already a big player in sectors like automotive technology but if we do not digitalise, we will lose our leadership position. Carsten Bermig (Cabinet Member of EU Commissioner Bienkowska) reminded that manufacturing is digital by nature and that our industrial policy must rely on sustainability, regionalisation and strategic value chains. Lord Ashton, keynote speaker (UK Parliamentary Under Secretary of State for Digital, Culture, Media and Sport) focused on the role of Government and responsible tech: how to protect citizens whilst encouraging innovation. The new technologies must reflect European values and if we use them to their fullest potential, we can make the bonds between citizens and their governments more robust.

Artificial Intelligence

The panel on Artificial Intelligence was opened by Khalil Rouhana (Deputy Director-General, DG Connect) who emphasized Europe’s reputation for delivering reliable products and services and the need for Artificial Intelligence to deliver on that promise. A human-centric approach to Artificial Intelligence is essential, as stressed by Abigail Hing Wen (Counsel for Office of the AI Chief Technology Officer, Intel Corporation) who also invited Europe to make the most out of the wealth of resources we have, such as Education and University Research.

‘In the future, skills ought to become more important and for that, more flexibility and broader training are needed.’

Martin Selmayr (Secretary-General of the European Commission) closed the event, by saying that Europe will only be digital if we manage to keep it together and fight to improve our democracies. In the future, skills ought to become more important and for that, more flexibility and broader training are needed.
The third EU Industry Days conference was organised by the European Commission on 5-6 February 2019 in Brussels. This year EU Industry Days were focused on “sustainability, globalization and innovation and digitalisation” and gathered around 500 participants from across Europe and beyond, including stakeholders representing industry, National and Regional Authorities and Trade Unions.

Key politicians messages

The European Commission President Jean-Claude Juncker opened the day by stressing that: “The future of Europe’s Industry will depend on its ability to adapt by investing in new technologies, digital and ecological transitions. Around a third of European employers say that they cannot find people with the right skills to keep growing and being more innovative”.

Mr. Juncker emphasized that “44% of Europeans still lack basic digital skill. And if even we have many highly qualified young people are in a job that do not match their profile”. The European Commission initiative “New Skills Agenda for Europe” is helping to plug the skills gap and support young and senior workers to develop new skills for today’s and tomorrow job market. He concluded saying “Skills and jobs should be our number one priority”.

In the same line, Kristalina Georgieva, Interim President World Bank Group emphasized that “The European Union needs to concentrate its efforts on the fast development of the digital economy in order to secure a strategic future world environment” and she outlined that “the skills are the most important assets of Europe”.

European Commissioner for Competition Margrethe Vestager focused her keynote speech on the importance of the investment in research and education. She highlighted the proposal for the next Multiannual Financial Framework where the European Commission has proposed to double the budget for ERASMUS+ programme.

She concluded by saying “We need an industrial strategy not for the few, but for all of Europe”.

EU Industry Days exhibition

During the EU Industry Days, an exhibition gave the opportunity to showcase innovative European ideas related to the themes of the conference. For instance, TalTech campus (Tallinn University of Technology) students developed a self-driving car and autonomous systems. The first self-driving car in Estonia was completed in cooperation between TalTech and Silberauto in autumn 2018. Currently, the car is being upgraded with additional sensors and advanced algorithms to make driving safer for everyone. After that, the focus will be on the production of a street-legal autonomous vehicle. This initiative is close to one of the EFVET project’s DRIVES, as part of the Blueprint of Automotive Sector Skills Alliance. The project aims to implement the Blueprint objectives for the automotive sector, namely the delivery of human capital solutions to supply chain SMEs through the establishment of an Automotive Sector Skills Alliance, covering all levels of the value chain (vehicle production, automotive suppliers and automotive sales and aftermarket services).

European Industry impact in today’s economy

The conference was closed by Lowri Evans, Director of European Commission DG Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) and Jean-Éric Paquet, Director DG- Research and Innovation. Both of them highlighting the importance of the European Industry impact in today’s economy. This represents a huge opportunity for jobs and business. Therefore, Europe must prioritize and accelerate its investment in the markets of the future, but also in the skills of the future, only this way Europe can become a global leader.
Changing world and a rapidly evolving technology, the challenge for Vocational Education

by Kari Puumalainen, member of SC

“If we really want to be able to teach future skills today, we must be able to break away from an educational institution / teacher-centered approach where quality learning can only take place in educational institutions very precisely in accordance with a pre-built path”.

The world has changed rapidly, and the speed of change does not seem to be slowing down. The main objective of vocational training is to train professionals for different needs of working life.

The challenge is to keep up with the changing society. Do we train professionals for yesterday’s professions or can we genuinely see through our daily chores and look to the future and changing skills requirements? Do colleges and teachers dare to change in time, or are we looking forward to seeing what’s going to happen? In this case, it may be a fear that we will become teachers of history also in subjects which should not be history.

The built-in problem of the so-called traditional school is the slowness of the effects of the necessary changes. Depending on the country and VET college, the average duration of studies is 2 to 4 years. If the curriculum is changed, the first experts with new competence requirements will be graduated after 2-4 years. Adding to this the time required to change a curriculum may well be 1-2 years or even more.

According to various studies, significant technological leaps are taking place in the movement of people and goods, the manufacture of products and pieces, the exploitation of artificial intelligence, etc.

How vocational colleges across Europe are facing this challenge? Are we genuinely ready to train future professionals and, if so, how can we do it? How the teacher education system is prepared to train teachers who teach students to professions that do not yet exist with techniques that have not yet been invented.

How educational institutions should change in order to enable us to make the necessary changes at both the individual and organizational levels? How can we use knowledge management methods and technologies to make the necessary strategic and operational decisions?

My own opinion is that if we really want to be able to teach future skills today, we must be able to break away from an educational institution / teacher-centered approach where quality learning can only take place in educational institutions very precisely in accordance with a pre-built path. We need to reform our own learning concept and at the same time break the boundaries of the teacher-student-working life and develop new types of learning environments that can be physical or virtual. We will probably also have to give up on a mindset “school>qualification>job>life” to a model where learning and work alternate flexibly throughout life. Such thinking is included for example in the key ideologies of Finnish vocational education reform. Identification of prior learning, regardless of how knowledge and skills are acquired. You’re ready when you know enough to do the job.

To support this work, EfVET launched several thematic groups at the end of 2018, with the aim of increasing co-operation between members in the development of vocational training in Europe. Technology and Industry 4.0 is one of these theme groups. The aim of the thematic work together with partners is to identify and modify how fast changing technologies and occupations change the requirements of VET. The result of theme group work is the vision of VET College 4.0.
In 2017, the Executive Director of Upper Savo Vocational College Kari Puumalainen requested an analysis of the connection between knowledge management and effective decision-making in vocational education management. PhD Jukka Soininen from TCD Consulting and Research Oy studied the link between IT management and performance in Upper Savo Vocational College.

The quality of vocational education is generally high in Finland. However, the quality of management varies between training providers. The strengths of management practices relate to teaching activities, and the weaknesses to HR management. (Jokinen et al. 2018; ks. Bloom et al. 2015)

To improve efficiency and service quality, training providers should pay attention to the need for renewed ways of working, creation of new innovative educational products, access to real-time knowledge, and critically review the service structure of education. (Collan et al 2006; see Newton 2007; Dickel et al. 2016)

Knowledge management organizations require functional information and communication systems that are conducive to effective performance (AlQdah et al. 2013; see Dickel et al. 2016) Information technology has developed rapidly and enabled real-time data collection, analysis, and presentation, hence making it possible to make quick decisions. (Marshall et al. 2015; Kaula 2015)

Brynjolfsson et al. (2011; see Cardona et al. 2013) conclude that data-based decision-making and performance of the company have straightforward causal relationship. According to them, for the decision-makers to make the best possible decision, they must have access to most comprehensive information, such as the competitive position in the market. Note, poorly-managed information technology investments will not result in productivity gains.

Many researchers have found the utilization of data analysis useful in decision-making. The question is, how the result of the decision is later committed to staff or customers.
Apro Formazione organizes periodically Tech Days in order to maintain a proactive relationship with companies and facilitate the identification of training needs and cooperation opportunities. The events are useful to facilitate communication among teachers, students and companies. Companies present their products and processes and participants discuss about industry 4.0, automation and innovation. The events take place inside the educational workshop of the vocational center in order to contextualize the events within an engaging and strategic environment.

Each event is characterized by an issue that is developed during the interventions held by technicians of large companies producing technical materials and services. Speakers make an intervention of 20 minutes underlining a technical approach and presenting a case study. Other interventions have informative purposes to present high-level activities carried out in cooperation with vocational centers, universities, employment agencies, stakeholders. An exhibition is organized at the end of the event in order to facilitate the “meet & match” among companies, customers, students and trainers.

In 2018 Apro Formazione made a research about the training needs of the Tech Industries of the southern Piedmont territory (hillside of Langhe, Roero and Monferrato) where there is an important industrial network due to the presence of multinational groups like Ferrero, Miroglio Group and Mondo S.p.a.

Apro Formazione interviewed 60 companies about innovation, digitalization and training needs. The main results of the research can be resumed as follows:

• The innovation of products passes through the embedding of innovative technologies in plants (energy optimization, downsizing of the metal components, insertion of sensors and electronic components, an introduction of robots, improvement of mechatronic components).
• The fundamental element of process innovation is the search for fluid and rapid connections between the sartorial design phases of the plants and the production - production, delivery and testing - of the products. The diffusion of 3D design systems plays a key role because it allows the early visualization of problems (apparently trivial, such as the difficulties of positioning or accessibility of components and pieces during assembly) that the two-dimensional design systems left unresolved.
• The development of the after-sales service, also thanks to product innovation (use of systems for monitoring and remote adjustment of the plant in operation, also through tools for visualizing the processes and plants during the ‘exercise). The most advanced companies endeavour to use fitting systems that take advantage of assisted visualization technologies (augmented reality) and test models based on process simulation, which reduces the risks of on-site testing of the plant.
• An important place is also occupied by the need to invest in IT security, in relation to the increasingly frequent on-line management of production and service processes. Data collection, storage and management represent an increasing investment area, particularly in B2B.
The competences required by the companies in the next years can be summarized as follows:

- Computer system management and programming
- Digital and 3D design skills
- Management of a numerical control interface
- Robotics
- Data Analytics
- Management of additive manufacturing processes
- Management of process simulators augmented reality
- Use of specialized software
- Integration and interaction between man and machines

Regarding the change in the transversal skills (soft skills) required to staff as a result of the introduction of new digital technologies and industry models 4.0, the results obtained with the distinguished impact by professional area, highlighting:

- **for the workers** a growth of importance in the order of a) autonomy, responsibility, adaptability and proactivity; b) ability to work in a group and c) problem solving;
- **for employees**, changes related to a) Fast and focused decision making/problem solving; b) autonomy, responsibility, adaptability and proactivity + ability to work in a group + digital communication;
- **for managers** a growth of a) Fast and focused decision making/problem solving; and b) autonomy, responsibility, adaptability and proactivity.

Companies express the difficulty to find solid people, motivated to invest in the future, awake and reactive, able to learn by working, without excessive support, because what is learned at school remains too often merely theoretical. It is particularly difficult to find people willing to work on a business trip, able to integrate specialized technical skills and relational and communication skills.

The companies need an operator who assumes the role of leader because he knows how to manage the order: from planning the intervention to the moment in which he installs and tests the system, he knows how to manage the supply chain and the customer, he knows how to manage the work team. Companies are searching workers who make the logical leap from knowing how to perform and do, knowing how to act, decoding the need, planning his intervention, orienting it to the result, sharing knowledge and information and using digital resources.
Europe is looking at Industry 4.0 – or the Digital Transformation of Industry – as the opportunity to operate a new kind of tech transformation all over the world. This requires raising awareness of both students and teachers to open source hardware and software alternatives for designing automated industrial systems. There are alternatives available at a lower cost than proprietary systems that might boost the innovative contribution to automation systems by small and medium enterprises (SMEs) as well as by young students.

These objectives are guiding the Erasmus+ OPENIN Project (www.openinproject.eu) that aims to offer open and innovative tools for the development of professional automated industrial systems based on Arduino platforms. Our approach fosters easy access to new technology in areas where training is traditionally expensive and rigid. OPENIN takes advantage of free platforms which are flexible thus providing a higher level of innovation and continuous evolution available to everyone.

The OPENIN approach was tested with students and professionals related to the industrial automation field. Each OPENIN partner promoted two pilot editions of the course previously developed under the project. This course is based on Arduino, an open-source electronics platform that is very versatile in the way it can be programmed and used with different hardware peripheral in a great variety of projects.

The pilot courses relied upon the use of different approaches to teaching Arduino programming and the use of different hardware components as a way to democratize the use of open source micro-controllers. All the materials were developed by the OPENIN partners.

Three different teaching/learning approaches were used in the OPENIN courses: traditional classroom Hands-On sessions; simulation of Arduino installations using TinkerCad Online Simulator and a remote laboratory named ArdLab. The attendants of the pilot courses came from different areas of study, with the majority having little or even no background knowledge at all of Arduino, electronics or programming. This was expected and desired since OPENIN is aiming to provide an entry point to the micro-control world for anyone with an interest in automation regardless of their technical background. The course covers a broad range of subjects in an introductory way and is guided by a practical, hands-on approach.

The attendees were requested to evaluate the course immediately after concluding it. This assessment was based on a questionnaire that, among other aspects aimed at collecting feedback on the strengths of the course materials and the different teaching/learning approaches.

The strengths of the Arduino course were found to be its range, its accessibility and its practicality. Among the different learning experiences (face-to-face hands-on sessions, using a simulator and the remote lab). The Hands-On approach came through as the most appealing way to learn Arduino and the most complete, in a sense that it exposes students to practical electronics issues. The possibility to reduce costs was identified as the biggest advantage of either the Simulator or the Remote Lab. Another issue revealed by the students was the possibility of improving the Remote Lab experience through the use of higher quality webcams with several views/angles over the Arduino installation and its components, through a wider range of available components or through the use of i2c devices and/or infrared communication.

In the field of education, remote access to real engineering experiments is growing and is currently accepted as a complementary solution to the traditional hands-on labs. Therefore, a remote laboratory integrating an Arduino device able to control specific electronic experiments was idealized and developed. With this laboratory, students can write Arduino code and, through a simple web browser running on a PC or on any mobile device, they are able to program a remotely located Arduino device in order to test their programs.
On the 7th February 2019 in Rome, in Palazzo Montecitorio - Sala della Lupa, the seminar “For the country’s employment and development - The Italian dual system, results and perspectives” was held.

The Conference - organized by FORMA (the national association of the VET Italian training institutions) and CONFAP (National Confederation of Vocational Training) was an opportunity to present the results of the second annual monitoring promoted by the association on the dual system, consisting in proposals meant to strengthen the vocational training system in our Country.

The opening was attended by the Honorable Mara Carfagna, Vice-President of the Chamber of Deputies, who expressed gratitude for the presence of many professionals of the Vocational Training sector. Among the parliamentarians who attended: the senator Nunzia Catalfo, president of the Labor Commission of the Senate and the honorable Andrea Giaccone, president of the Labor Commission of the Chamber. Everyone underlined a key aspect of the Vocational Training system: the relationship between training and employability which, especially in the dual system, becomes even more solid.

Scuola Centrale Formazione is among the witnesses of this extraordinary experience, together with the “Artigianelli” Training Center (associate SCF) and Nero Giardini, a company that promoted a first course of “Footwear Operator” in 2012 by Artigianelli. In 2016, together with the company and the Marche Region, dual experimentation had started following this path. Enrico Bracalente, sole director of B.A.G. Spa, owner of the Nero-Giardini brand attended the event by presenting his experience and support to VET and he expressed necessity to invest in training for the country growth and development.

The sectors in which the dual system is tested are varied, including new technologies, as evidenced by Fondazione Luigi Clerici (associate SCF), which promotes a laboratory teaching through the SKILL TRAINING SPACE, a center of technological empowerment to enhance students’ skills.

The national experimentation of the dual system in the Regional Education and VET pathways, promoted by the Ministry of Labor and Social Policies and introduced through the State-Regions Conference Agreement dated September 24, 2015, was established with the aim of strengthening the link between the educational and entrepreneurial system.

Some data about the dual system in training centers: in the second year of experience 169 centers have been activated, in 15 regions in Italy. There was an increase from the first year to the second in terms of companies activated (5100) and the maintenance of 19% share of apprentices. The number of students increased (from 3,931 to 6,974), marking + 77%.

Through the experimentation of the dual system, the relationship with the companies is strengthened: they become real partners for the design and the joint realization of the training courses. The basic pedagogical idea is that any work experience can offer enough ideas to achieve the envisaged training objectives.

Among the experiences presented, in addition to Scuola Centrale Formazione, also that of other EFVET members: ENAC (Ente Nazionale Canossiano), Fondazione Casa di Carità Arti e Mestieri and ENAIP (Ente Nazionale Acli Istruzione Professionale).
In the last two or three years we have been hearing a lot about industry 4.0, digitalisation or smart factories in the media, in politics, in companies, and in vocational schools.

However, the concept is many times misused and/or misunderstood. It was born in Germany from an initiative from the German Government and pursues the highest efficiency and adaptability in industry, linking the physical and cybernetical world in a manufacturing environment. This definition leads to a conclusion that is often overlooked, industry 4.0 is not referred to the implementation of technology per se, but to the use of available technology to improve business models from different points of view, such as product design, organization within the company, interaction with customers… Anything that can lead to a quicker and better answer to the market needs.

In this process of improvement, there are 3 key factors that are disrupting the industrial world:

• New technologies, tools and machinery (and new ways to use them)
• Changes in the decision-making process inside companies.
• New ways of communication, not only between people but also people to machine or machine to machine.

With these 3 factors in mind, diverse research from the EC, the World Economic Forum or the OECD to mention just a couple, seem to agree on shaping the characteristics of future workers as follows:

• Variety, i.e., a person does not do only one type of work in his/her job position and will probably change professions several times in his/her life.
• Less monotony and physical work.
• Shared space between robots and humans.
• Decision making in all job positions, especially decisions based on data analysis.
• Vertical and horizontal teamwork, and also teamwork person/machine.

This perspective obviously leaves open a road for adaptation which goes from upskilling/reskilling in a continuous lifelong learning process to important changes in organizational structures and mentality. In this sense, not only companies but also education providers, in all levels of education, face a challenge: adapt or disappear.

**What can VET schools do to adapt?**

There is not an easy answer to this question but let’s start by being proactive VET schools (and not reactive), acting over those aspects that we can influence.
Contents and methodologies are important factors that influence in the development of competences of a person. In this regard, VET colleges should provide more interdisciplinary activities (to promote cooperation between different areas of expertise and versatility in students), introduce new contents in line with technological development, adapt their learning methodologies towards those which lead to the acquisition of the competences to facilitate flexible and efficient structures in organizations (teamwork, autonomy, adaptability, analytical thinking, problem solving...) and enhance the acquisition of digital skills in all VET programmes, as digitalization is the base of what it seems to be the new industrial revolution.

VET teachers and VET schools, like companies, will need to go through an adaptation process where cooperation and co-creation will rule their daily life: cooperation with other VET schools, cooperation with companies, cooperation with innovation centres... Ultimately, with all necessary agents to tackle different challenges in each case.

The European Commission is boosting the appearance and reinforcement of VET networks at the national and European level, as well as the creation of Centres of Vocational Excellence. EfVET has created thematic groups to deal with the challenges of the future in different areas, including technologies industry 4.0 or digitalisation of learning.

And VET schools around Europe have themselves started to move in different directions, focusing on diverse aspects related to the jobs of the future, like technological skills update of teachers, implementation or improvement of learning methodologies or building of networks at the local and international level.

HETEL, as an association of 24 VET schools from the Basque Country committed to the socio-economic progress of the region, has joined some initiatives at the regional and international level. For example, we were involved in the Basque Industry 4.0 discussion group together with universities, technological centres and sectorial clusters, we have joined EfVET’s thematic group on industry 4.0 and we have developed our own projects on industry 4.0 in cooperation with other VET schools from Europe, like LAIT 4.0, for the technological update of VET teachers and their approach to the impact of industry 4.0 on companies, or CyVETsecurity, to raise awareness of the importance of data protection at the personal and professional level and develop cybersecurity skills in a range of professional profiles.

We have a big challenge ahead, and only those who abandon resistance to change will have chances to overcome it successfully. But better together!
The DRIVES project, an ERASMUS+ Blueprint Sector Skills Alliance for the automotive sector, is celebrating its one-year anniversary.

The 24 consortium members of the project DRIVES had a two-day work session in Lomazzo, Italy, hosted by the ComoNExT1 innovation hub, to share their accomplishments in 2018 and talk about the next steps, in their mission to study the future skills needs of the automotive sector.

Each of the project’s work packages, together with the Steering Board members, joined by representative from the European Commission’s DG GROW2, presented and discussed the projects achievements this past year.

During this period, the project reached almost four hundred stakeholders, small and large, that are part of the bedrock the automotive sector, inviting them to be part of the discussion. Moreover, the consortium has identified 20+ important job roles in this industry, with which VET and Universities partners will prepare teaching material to deliver pilot trainings.

As first results will be seen, the partnership faces the challenging dynamics of the project, focusing on all measures to ensure successful roll-up - have a sustainable framework of solutions for the long term, reflecting the changing environment of the automotive sector.

Throughout the two-day meetings, dedicated workshops allowed thorough discussions on skills transferability, apprenticeship marketplace and sustainability of project results.

DRIVES was present at several events since the kickoff meeting, in January 2018, to boost the project dissemination among stakeholders. The promotion seminar in November 2018, involving external stakeholders, to share experience among running blueprints in different sectors and maximise impact beyond the partnerships, was the window offered by EASME. The Directorate of Transport also organised an event/exhibition with the different transport modes, allowing to showcase DRIVES project.

DRIVES is an important follow-up of the GEAR 2030 recommendations; the strategy being developed is one of a kind and crucial for the future of the automotive industry.
Third edition of e-MOTIVE
by Tamara Rodriguez, HETEL, Spain

New academic year and new opportunity for a cooperation between HETEL and ROC Da Vinci, following e-MOTIVE´s methodology.

In this new edition, the HETEL’s VET schools taking part are Egibide, La Salle Berrozpe, Zulaibar and Somorrostro, together with the Dutch college ROC Da Vinci.

The e-MOTIVE project is the European version of HETEL’s project Diseinua, implemented in the association since 2006, where students from different VET centres learn cooperatively, working from different locations. From the national version of this cooperation methodology we jumped to an international version with e-MOTIVE in 2017 thanks to Erasmus+ funds and from 2018 thanks to the support of BBK Fundazioa, Fundación Vital and Kutxa.

Students participating this year met in January in the Basque Country and the teams are already working to solve the challenge proposed by their teachers this year: to design a machine to produce filaments to be used later on, for example for 3D printing, using plastic as raw material.

The participants in this project, apart from learning collaboratively solving a project, acquire other skills and competences, as the use of English as foreign language, working in multicultural teams, independence and self-management.

The solution of the challenge will be presented to a jury of teachers and employers in March in the Netherlands.

In HETEL, we are greatly satisfied to see that this working methodology keeps going one more year!

Drone European Platform
by Selina Martin, CECE, Spain

Drone European Platform, DEP, is an Erasmus+ project coordinated by CECE – Confederación Española de Centros de Enseñanza – in which three VET agricultural schools from Europe, an italian company who provides labour-connected services in accreditation with Regione Lazio, and a Dutch company of training and labour insertion are working to insert drones in education.

DEP project has already developed several activities. A course in which it is possible to learn how to build and fly a drone is almost finishing, and soon it will be free and open to all schools and all users in Europe. The project is mainly focused on agricultural education, but part of the didactic units developed have a transversal value that makes them useful for any teacher who wants to use a drone as a tool for educational matters.

In November 2018, a training was held in Valencia, where three teachers from each school from the partnership learnt from two drone experts the step by step of building and flying a drone. The training was also an opportunity to test the effectiveness of the course developed in the project so as the other aspects developed during the project life time that begun in 2017. After the training in Valencia, a cascade training soon will happen in the schools from the project, where the teachers that have attended the training in Valencia acquiring the necessary knowledge and skills to perform the on line course and teach to a wide number of students and teachers the process of build and flying a drone, and the opportunities that it offers in agriculture. http://moodle.edudrone.eu/

Consortium: CECE: Confederación Española de Centros de Enseñanza (ES), EFA La Malvesia (ES), TIRANTES (NL), Green Academy Aarhus (DK), Heli-con (NL) and ERIFO (IT).
Digital Tourism

Digital Tourism Erasmus + Project has started, the new project look into the Industry 4.0 Revolution aiming to develop students & teachers new digital tourism skills & increase labour mobility opportunities. The first kick-off meeting was hosted by the project coordinator EfVET Member Insignare – Associacao De Ensino E Formacao, in Ourem, Portugal.

This project develops a new qualification for one of Europe’s and World’s highest growing sectors, Tourism.

Digital Tourism targets both Tourism and IT skills, meeting the market new trends of consumer choices, mostly online and through peer reviews.

The partnership will work to create a new qualification profile to cope with the impact of digital transformation on the tourism sector.

The project will provide professional knowledge and skills targeting promotional and marketing strategies based on IT (e-tourism), as digital services raise companies’ profile on generating economic development. Students will also be mobile, as the course will be designed to be implemented in international companies; it will also include long term WBL, with a minimum of three months.

The partnerships is compose by: Istituto tecnico commerciale statale f. scarpellini (IT), European grants international academy srl (IT), ACISO – Associacao Empresarial Ourem Fatimap, (PT), Stichting groen onderwijs oost Nederland (NL) Stichting Dutch Foundation of innovation welfare 2 work (NL), Centro de formacion de administracion y hosteleria s.l, (ES) and EfVET (BE).

DC4Work
Promoting Digital Competences for a Job 4.0

by EfVET

On the 7th of March EfVET organized the DC4WORK Project Multiplier Event at the Delegation of the Basque Country to the EU.

The project aims to increase the digital competence of employees in order to overcome the challenges of a rapidly transforming world of work by providing guidelines and tools to in-company experts – digital competences promoters – to support up-skilling of the staff.

Stela Stancheva (EfVET) offered some interesting insights on the project and its outputs: White Paper, Guidelines for the training of the digital competences promoter and an Online Toolbox.

She focused her intervention on the dynamics we are immersed in nowadays. With the Industry 3.0 (Digital) ongoing at the same time as Industry 4.0 (Communication & Connectivity) which is evolving quickly towards a fusion of advances in artificial intelligence, robotics, genetic engineering and other technologies, many believe that 2019 will be the year of transformation into Industry 5.0. The job market is evolving at an extremely fast pace triggered by new technologies and the rapid adoption of artificial intelligence making it a complex environment.

It is crucial that digital competences promoters learn about the various leadership styles in order to empower the company and the staff by encouraging digital competences and competitiveness. In the time of knowledge based economy and continuous digital transformation only learning organisations will be competitive.
EfVET NEW MEMBERS

Zadkine
(Rotterdam, NL)
www.zadkine.nl

Stavroula Bibila
Degree Apprenticeships
(Trinity Enterprise Centre
Leeds Trinity University,
Leeds, UK)

BMSZC
(Újpesti Két Tanítási
Nyelvű Műszaki Szak-
gimnázium és Szak-
középiskola)
Budapest (HU)
www.umszki.hu

Chamber of
Commerce and
Industry of Slovenia
(Ljubljana, SL)
www.gzs.si

High Vocational
School of Tourism
“D-r Vasil Beron”
(Veliko Tarnovo, BG)
www.vtpgt.com

ESMOVIA
(Sistema Practices s.l)
(Valencia, ES)
www.esmovia.es

DomSpain
(Reus, ES)
www.domspain.eu

M&M
Profuture Training
(Cornellà de Llobregat, ES)
www.mmprofuture.com
EfVET Announcements

Job Opportunity: Programme Manager
EfVET is looking for a programme manager to join Brussels Staff.
Job description is available [here](#).
Applications: To apply, please send your CV and cover letter in English (with reference “Programme Manager” in the subject line) by 20 March 2019 to president@efvet.org and efvet-office@efvet.org.

Logo Competition: EfVET VET Colleges
EfVET launches a branding competition for Thematic Teams. The Call for entries is addressed to all students from EfVET Members VET colleges.
Competition description available [here](#).
Applications: Please send your proposal to Alicia Gaban Barrio ag@efvet.org by 30 March 2019.

Resources T & I 4.0

How can students gain tech skills for Industry 4.0?, [Siemens PLM Community](#)

Skill Sets Required for Industry 4.0, [Vitria Marketing](#)

Industry 4.0 mismatching and reskilling, [Randstad workforce insights](#)

Success personified in the Forth Industrial Revolution, [Deloitte Insights](#)

A Discussion of Qualifications and Skills in the Factory of the Future: A German and American Perspective, [VDI and ASME Whitepaper](#)

Skill Development for Industry 4.0, [BRICS Skill Development Working Group](#)

China: From 2019 the AI Enters into the High Schools Curricula, [FBK magazine, Feb.2019, in Italian](#)