DIGITALISATION AND THE WORLD OF SKILLS AND EDUCATION

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ceemet European Tech & Industry Employers
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INTRODUCTION

5 KEY LEARNINGS://

• The ever-increasing demand for digital skills in combination with reducing half-life of knowledge is widening the skills gap. Lifelong learning is central in building tech talent and employability, also in view of the demographic changes. It is also part of the solution to tackle social inequality.

• Change structures, less so contents: with the fluidity in digitalisation of labour markets we need a flexible and responsive education and training system for workers to acquire the right skills.

• Skills demand for a digital industry must be addressed by focusing on science, technology, engineering & maths and by making vocational education & training a 1st choice for learners.

• All Member States need to integrate the learning of digital technology & skills across all curricula and develop appropriate teaching methods too. Digital skills should be seen as part of a basic education, such as reading, writing and arithmetic.

• Don’t neglect the importance of digitally savvy leadership to create new business (models), transform businesses and inspire a digitally skilled workforce.

Each day, driven by modern technology and digitalisation, businesses and workers are challenged to be even more innovative as it stands for progress and growth. Education and (further) training are a precondition for innovation. Yet, innovation in the world of work is hampered – by various factors such as the lack of relevant skills and rigid education systems and a reluctance to train and learn throughout professional life.

The first report in Ceemet’s series on “Digitalisation and the World of Work” (2016) was a starting point for debate, providing necessary and compelling evidence of the fundamental changes taking place in the workplace – from skills demand to working time - as a result of digitalisation. Nevertheless, digital transformation moves with the speed of light. New insights must be generated, input collected and brought together to maintain a relevant and facts-based discussion that offers solutions.

This report, “Digitalisation and the World of Skills and Education”, seeks to contribute to this process. Honing in on a specific field, this report focuses on education and training as an intrinsic part of work life which digitalisation fundamentally changes as well as is critically dependent upon.

A Future of skills

Digitalisation holds great potential for manufacturing companies in Europe and if we get it right, it will have a lasting and positive impact on companies, individuals and society as a whole. The potential to shape and capitalise on the promises of digitalisation largely rests on having an agile workforce with the right skills for jobs that yet have to be created.

Because many manufacturers today have problems recruiting talent, they are wondering about what the future holds. How can more students be encouraged to pursue and successfully finish Science, Technology, Engineering and Mathematics education (STEM) and Vocational, Education and Training (VET)? What can employers do to attract and keep talent? And will the digitalisation of European industry be fast enough to compete on a global market?
HAVEN’T WE HEARD THIS BEFORE?

It is commonplace for too long now to only say that “no education is far more expensive than education”. The mismatch between skills demand and supply is not a new problem. It has been repeatedly said at various (high-level) events since the publication of the Ceemet report in 2016.

What is different today for training and education institutions as well as for companies is the disruptive force of technological development and the difficulties entailed in responding quickly enough to those changes. Lack of flexibility and effective anticipation combined with problems attracting students to STEM subjects and VET, and in some cases a reluctance to continue training, risks turning the skills gap in Europe into a chasm, with serious socio-economic implications.

_Education & Training systems_

Europe has the most educated workforce in its history, yet we miss the mark!

_TARGET_FAILURE_

One of the EU’s targets for 2020 is to reduce the share of 15-year-old pupils who fail in basic reading, math and science tests to below 15%. Tests carried out every 3 years reveal that not only has the EU been lagging behind this target, it has now moved even further away from it. In 2015, 20.6% of pupils did not achieve basic proficiency in science. This is a rise of 4% points compared to 2012. Worryingly, the difference in the share of low achievers between pupils from the highest and lowest socio-economic backgrounds is striking. Since STEM is pivotal in developing digital competence, this trend is problematic for Europe.

_LACK_OF_RESOURCES_

A serious barrier to developing digital competence - and possibly a contributing factor to the failures described above - is the lack of adequate digital skills and competences in the education systems. 75% to 80% of students are taught by teachers who are not digitally confident. Schools across Europe do not have sufficient resources for relevant technological equipment or for updating or upskilling teacher qualifications. Currently, there are simply not enough schools and universities that are digitally competent in their teaching or highly digitally equipped.

_SKILLING TODAY_

FOR TOMORROW

Easy access to digital -
by School Cloud

_THE_GOLDEN_TICKET_

NO_ONE_WANTS_

In addition, it remains difficult to attract young women and men to study STEM related subjects or choose vocational education even though labour market demand for STEM and VET competence remains high - and will continue to grow. Regarding STEM, there is still a strong connection between the gender stereotypical image STEM suffers and affinity for STEM among the female population. While strategies to attract more girls and women to STEM have increased female talent in the subjects, it is not at the rate hoped for. When it comes to VET, there is still not enough emphasis on excellence in VET and its well-paid jobs.

__THE_BALANCE__

FROM.Today

Redraw The Balance – by Inspiring The Future


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2 COM(2016) 9th Final: A new skills agenda for Europe

3 Ceemet Chief Economists Report 2017

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Cloud infrastructure ensures the easiest access, independent from hardware and digital literacy level. The aim is to support the digital transition by familiarising children at the earliest age with the advantages digitalisation brings. The upscaling of the pilot project can easily be done because of cloud technology.

During the initial test phase from the beginning of 2017 and until April 2018, 25 selected schools in 14 regions ('Länder') will contribute to the (further) development of the prototype. The second phase of the project will run from May 2018 to April 2021 and covers all 300 network schools.

One of the greatest requests from primary schools is help in broadening the aspirations and interests of children regarding jobs and careers. As research shows, gender stereotypes are never seen and don’t exist.

As online match-making platform Inspiring The Future was launched in 2012 by the Education And Employers Charity. Its objective is to connect schools and colleges with volunteers from all backgrounds and from a range of sectors and professions going beyond what young people know and see.

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### Lifelong learning (LLL)

The reduction of the “half-life” of knowledge is driven primarily by ever-shorter innovation cycles and the speed of technological development. Employers largely recognise the importance of continuing training and are the biggest contributors to adult learning, accounting for roughly 50% of all spending. This does not mean they do not struggle with LLL. Small and Medium Sized companies (SMEs), the majority of companies Ceemet represents, often find it problematic to train. Either they are too small to provide training themselves, they cannot find education and training institutes with training offers that suit their needs, or it is difficult to find a temporary replacement for the worker on training.

Another dimension of the problem for employers, however, is the low level of uptake of training offers among those already employed. This challenge is compounded by the demographic development of most European countries. Less than 1% of Europeans aged between 25 and 64 are engaged in LLL. This percentage develops contrarily to age, when digital right-skilling becomes more pronounced. And although LLL is a shared responsibility between employees, governments and employers, more than anything it requires motivation and self-management on the part of workers.

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**SKILLING TODAY FOR TOMORROW:**

> A hub to jump further – by Technology Hub

Aston, Birmingham, hosts the UK’s premier facility for training and development for apprentices and professionals in manufacturing and engineering. The UK training and skills landscape has changed significantly. UK manufacturers have to navigate these changes whilst continuing to train and invest in their workforce. Significant changes such as the apprenticeship levy have had a profound negative impact on the delivery of apprenticeship and skills training by providers, and the ability of manufacturers to access high quality training for their workforce. Yet, over a quarter of UK manufacturers say that a lack of suitable training provision is a barrier to recruiting more apprentices.

A primary driver in EEF opening their own Technology Training Centre was the variability in training that manufacturers would be able to access. The Technology Hub has been designed and equipped to replicate real-life modern engineering and manufacturing workplaces and is responsible for delivering vital technical skills.

The new facility boasts 280 IT stations, £1.3 million of equipment and tools and has a wide range of areas devoted to developing technological skills, including robotics, electronics and rapid prototyping. The Technology Training Centre currently runs over 30 different technical training courses, works in partnership with 10 employers and trains approximately 40 apprentices a year. Since its opening in 2014, this represents over 900 apprentices in programmes over the various year groups for over 150 employers across 240 locations.

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### 7 ESSENTIALS WE LOOK FOR_

65% of the children entering primary school today will likely work in job types that do not exist yet. Therefore, it is a tricky business to predict exact skills requirements. Nevertheless, we can identify a range of skills to cope with the new occupations and tasks.

#### 1 Interdisciplinary skills

*What* – refers to a broad set of knowledge, skills and work habits that are critically important for success.

*Why* – interdisciplinarity is critical to developing and applying innovative solutions to complex challenges, e.g. the use of data analysis tools and production processes or mechatronics.

#### 2 Computational thinking

*What* – is the thought processes involved in formulating a problem and expressing its solution(s).

*Why* – with an increasing importance of man-machine interaction and cobotisation, knowing in what way a computer—human and/or machine—can effectively carry out the solution, will be part of the business model.

#### 3 Analytical skills

*What* – the ability to work with big data (analysis and use), make data-based decisions and create new business models based on data information.

*Why* – it will become increasingly important in particular for employees who operate production equipment as they have to understand the continuously automated and autonomous processes. The amount of digital information generated from sensors, equipment and platforms keeps increasing exponentially.

#### 4 System design skills

*What* – the understanding of how systems work and how to create added value.

*Why* – at the time that existing business models are under pressure, continuing their development and/ or reinventing them will decide to what extent that business will have a future.

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Cybersecurity skills

What – knowledge of how to regulate access to computer files, develop firewalls, perform risk assessments and test data processing systems to verify security measures as cyber threats are everywhere and come in various forms.

Why – data is the new currency. The success of data mining and the protection of databases, networks, hardware, firewalls and encryption decides if business is, not only secure, but also successful.

Creative & entrepreneurial leadership

What – an understanding of how to create and transform new and existing businesses and create digital era firms, both in terms of value chains and products.

Why – new businesses, products and services are developed at a rapid pace. Humans will be needed to build, lead, maintain and market them. Leaders will have to develop the ability to encourage radical or unconventional thinking and build mechanisms to reward innovative thinking.

Soft skills

What – the way we interact with each other, or interpersonal skills. The ability to e.g. cooperate, communicate (across different -business- cultures) and solve problems.

Why – in addition to technical competence, maintaining social and emotional intelligence in a complex production chain and agile working environment is instrumental.

OBJECTIVES – LIFTING INDUSTRY & INCREASING DIGITAL SKILLS_

There are long standing, traditional definitions of what basic skills in literacy and numeracy are. A commonly recognised definition of basic skills must continuously updated to include digital skills, identifying a minimum level of literacy, numeracy and digital skills.

Technology and digital skills must steadily fill the entire education and training system at all levels. The general level of digitalisation and technology sense of students and workers needs to increase. The level of skills must reflect the development that is taking place in the industry and on the labour market in general. After all, skills and education are the best tool to tackle social inequalities.

Improve anticipation

Simply investing in more skills will not be sufficient – it has to be the right skills. This requires better anticipation of skills needs through improved quality and use of supply and demand data, including:

SKILLING TODAY FOR TOMORROW:

Maintaining the future – by industryfuture.org

“Alliance of Industry for the Future” (AIF) is a structure co-founded by UIMM uniting professional representatives. It is part of the 11 strategic plans defined in 2015 by the Minister of Economy at the time, aiming to improve modernity and excellence of French industry.

In collaboration with two well-known high schools (Arts et Métiers ParisTech and Institut Mines-Telecom) UIMM launched a study on the effects of digitalisation on skills by the example of ‘maintenance’ jobs. We know that digitalisation is changing the world of work, but so far there is no scientific and industry-based study looking at what skills a certain profession will require. Maintenance jobs were chosen as focus of the first analysis. Today these jobs are centred around correction and prevention.

Tomorrow, these exact same professions will be focussing on improvement and prediction. The result of the study should help define the objectives of what maintenance will look like in the future.

In December 2017, the outcome of the large study carried out by researchers and industry experts was presented. Jobs in maintenance are developing quickly. Future maintenance professionals will, for example, need to know what the risks of cybercrime are and how prevent it.

Workers will occupy a new place within the (global) value chain. This results in a more fluid zone between maintenance and production. The working environment will be multicultural and multidisciplinary. In terms of skills, the analysis revealed that curiosity and inventiveness are assets. Equally rigorous, methodological thinking and being open to any improvement that is suggested on a worldwide scale are skills that will be in demand.

A 2nd analysis focused on ‘management’ related jobs is being carried out, while the 3rd analysis is in a preparatory phase and will focus on ‘logistics and production’.
Digitalisation also changes the functioning of our society. Consequently, education and training must adapt by focusing on the following areas:

### Cooperation
- The educational revolution is built upon an intensive and extensive collaboration between relevant players. This means that governments, industry and social partners have to create an environment ensuring that individuals can invest the time, motivation and means to (right)skill.
- Cooperation between education providers and industry is important in moving towards a more relevant, effective and transformative use of digital technologies. Employers need to play a role in the design and development of curricula, making sure that courses reflect the development taking place in industry and the labour market. Where possible, governments should facilitate teachers spending time in industry through work placements.
- Strategic cooperation between industry and higher education is imperative. E.g. integration of project-based learning in universities. Higher education institutions often have links to large global companies, but SMEs have less access. Platforms could help higher education institutions cooperate with SMEs and industry as a whole.
- Education providers need to develop more attractive, open and inclusive ways to bring people into different phases of their life and professional cycles back into education. This requires more flexible education and training systems, which work closely with industry, so workers can rightskill when and where needed.
- There is no need for the creation of completely new VET qualifications – instead, the already existing qualifications should be interlinked and adapted. It is therefore necessary to identify and develop with industry additional qualifications and qualifying components that should be taught in VET.

### Rethink education & teaching

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- The success shows that the Digital Innovation Hubs (DIH) play a key role as one-stop-shops on a local level to (re)train SME employees. The skills output from these hubs are important for industry and need to be further documented and made available for wider use.

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**Switching to individualised learning**

We are slowly moving from a one-size-fits-all, standardised approach to learning towards more individual learning pathways. Customised learning can help students and workers develop their innate talents and capabilities. While previously a costly form of learning, the increase of digital tools has lowered the cost for individualisation significantly and it is now a real option.

It should be possible to more freely combine studies from different (VET) programmes (e.g. automation technology, mechanical and software engineering) and courses from different educational levels (e.g. from VET education and practice-oriented higher education). This is essential in enabling education to reflect the enhanced or new skills requirements.
**Digital literacy**

- Basic coding is where it all starts. Coding should be introduced in every classroom across the EU, together with logical and critical thinking. This requires investments in teachers to be on track of latest developments.
- Digital learning, both the learning of digital skills and use of digital technology, need to be integrated across all curricula.
- Teaching in all subjects should provide students with an understanding of how technology and IT work and the possibilities, risks and limitations that technology has.
- Work-based learning is an effective way of getting digital literacy into the workforce, not least through ‘reverse mentoring’. This interwoven concept builds bridges in companies between young learners with a high degree of digital literacy and their senior colleagues.
- Both science universities and universities of applied sciences provide studies in analytics and cybersecurity, mainly for degree students. The competence base is improving in width and depth. It should be further improved to ensure flexible, extensive and high-level education and training in this rapidly changing environment, particularly the possibility of workers taking modules at higher education level.

**Changing mindsets**

- We really do have to change the way we think about lifelong learning and act accordingly. The notion of training and learning throughout life needs to be introduced already in early childhood education. Lifelong learning needs to be understood in positive terms, and as something for which individuals also are willing to give of their own time outside of work.
- Ongoing training is a win-win situation for employees and companies. They should therefore both commit to, and participate in, the effort and accept responsibility. The employer by allocating resources and the worker by investing time outside of working hours.
- Initiatives such as Vocational Skills Week are a good start but do not replace an investment offensive in first-class vocational schools.
- Policy makers ensure parity of esteem and means between general education and vocational schools. VET must be perceived as what it is: a 1st choice leading to quality jobs.
- There is no talent to waste! Increasing female STEM talent is vital for industry. In order to attract more girls and women to STEM, it is important to evaluate the impact of measures and actions already taken and to pursue long-term strategies based on proven results.
The recommendations in this publication are the result of discussions among industry experts concerning actions that the EU, national governments, education and training providers, social partners, employers and individuals could take to close the digital skills gap. It is clear that we are in the midst of a dynamic process of which the result cannot be anticipated. Therefore, all stakeholders have to be more open to trying new pathways and solutions. One main conclusion is that the skills gap is mostly linked to the fact that the education and training systems in Europe are currently not able to catch up with the pace of technological change. A positive effect is that, if properly dealt with, a good digital skills set can narrow the social inequality gap. This means as well that not embracing the need to step it up is self-defeating and putting the social Europe as we know it at risk. If the European Union wants to strengthen its leadership and stay ahead of the global economy and society impacting technologies, it must act on the following:

### EU level

Within its remit, the EU has recently been accelerating its efforts to highlight the importance of digital skills, STEM disciplines and entrepreneurial competences. However, these good initiatives alone will not be sufficient.

As follow up to the Commission’s Communication “Towards a European Education Area by 2025”; an “Education package” was adopted at the beginning 2018. It comprises a Council Recommendation putting the focus on the need to develop basic skills and soft competences in the context of lifelong learning. The package also includes a Digital Education Action Plan to support the overall development of digital skills and competences. The initiatives of the Recommendation e.g. propose to raise the attractiveness of STEM studies and careers for - in particular - women and youngsters, is something Ceemet has been consistently calling for. Its members have been active on the topic as this report shows.

As digital skills are permanently evolving, Ceemet has often underlined the need to regularly update the definition of digital skills. Ceemet welcomes that the Commission did so by including coding, cybersecurity and citizenship aspects. This fits with the additional priority the Commission identified: boosting entrepreneurial competences and digital entrepreneurship.

For this purpose interactive training material and Computer Numerical Control (CNC) simulation software will be developed, in line with the European Qualifications Framework (EQF) for VET programmes. Such a digital training programme will be the first state-of-the-art interactive programmes in the Baltic countries. Professional coaching is offered to maximize potential and unlock latent sources of productivity.

Metalwork graduates from VET institutions from the countries involved lack skills to operate CNC machines. Because of the limited interaction between VET institutions and the private sector, skills development as well as hands-on training is of paramount importance to industrial growth. A first step is to train the trainers via an integrated coaching methodology. The project outputs will be developed in close cooperation between private sector and VET providers to enable the creation of VET programmes that respond to changing skills needs in companies and society. By the end of the project, the consortium intends to translate these into innovative, learning-outcome-oriented vocational curricula including periods of work-based learning, applying the European Credit System for Vocational Education and Training (ECVET).

However, for companies it is difficult to keep an overview of what and where initiatives are taking place and how to get easily involved in them in order to overcome their “digitising challenges”. The so called “European platform of platforms” on digitising the industry, launched in March 2017, is a good starting point to streamline and coordinate the different initiatives that exist at national level. This will facilitate the uptake of digital technologies and training by the manufacturing industry.

A user friendly “EU one-stop-shop”, would help companies, especially SMEs, to tackle their skills gap.
The “digital labour market” should be understood as being a fluid labour market. Companies have the possibility to easily make use of the digital technologies to adapt to a changing reality.

Education policy

Member States must recognise this reality and shape their policy adequately. Education and training systems able to adapt to the future (digital) skills needs of industry are the key to keep, create and grow industry in Europe.

LIFELONG LEARNING

Member States should focus on how training systems can fully live up to their responsibilities by involving companies in the (re)education and training of skilled workers. This includes companies, SMEs in particular, that cannot provide a full education programme. Where these training systems are not practical, facilitate the use of online tools such as high-quality and labour market relevant VOOCs to allow small and medium sized companies to, as possible, train their employees with the least disruption to production.

National stakeholders

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VOCATIONAL, EDUCATION & TRAINING

Governments need to contribute to shifting the perception of VET. This can be achieved through greater industry – school cooperation in governance as well as through offering work-based learning, teacher exchanges and apprenticeships. Foster permeability between VET, general and higher education will make it easier for students to move between systems and thus increase its attractiveness. Consistent follow-up on the goals of vocational education reform is needed, including quality assessment and offers to ambitious students.

SKILLING TODAY FOR TOMORROW

Managing change successfully – by Social Partner Agreement

In Germany the Social Partners of the Metal, Engineering & Technology-based industries (MET), Gesamtmetall, IG Metall, VGMbH and ZVEI, negotiated an agreement signed in April 2016 titled “Training & Qualification for Industry 4.0 – Managing change successfully.”

The Social Partners committed to analysing all relevant vocational education and training occupations and advanced vocational training with the goal of assessing whether they need to be updated to fit the requirements of industry 4.0. Social Partners organized this process and involved company experts as well as scientists in order to develop concrete proposals for further measures.

They came to the conclusion that VET and CVET in the German MET industries must be updated to fit the world of industry 4.0 but that there is no need for completely new job profiles or to shift the practical orientation of existing occupations. They agree that the training regulations of the industrial metal and electrical occupations need to be partially revised.

The concrete recommendations for action published early 2017 are currently being worked through by the competent ministries and key decision makers and being put in place via an accelerated procedure so that companies can train according to the updated training regulations as of August 2018.

GENERAL & HIGHER EDUCATION

Member States who do not already have a digital or technology pact intended to strengthen and promote digital education at general and vocational schools should seek to emulate good practice around them. Both industry and universities must join forces and support government in the development of new curricula and training programmes. A concrete way of increasing digital skills in Europe would be through the introduction of Chief Digital Officers in schools. This would give schools the opportunity to stay ahead of the digital curve in relation to the digital education of young Europeans.

Managing competences for the future – by Smart-COMET

Smart-COMET is a joint project between the Turkish employers’ association of metal industries, MESS, Deka Akademie GMBH, Fundacion Laboral del Metal, MESS Training Foundation and the Turkish Ministry of National Education that will develop, pilot and implement a competence management system for the metal sector.

Within the framework of the project, on a pilot basis, a school-enterprise cooperation system will be designed and implemented for metal sector companies using a competence management (COMET) approach.

It aims to improve enterprise and school capacity to manage human resources challenges including, but not limited to, the ability to better manage and anticipate skill needs over a strategic horizon.

The objective is to help participating schools to better adapt to evolving labour market needs by working closer together with metal enterprises.
Digitalisation and the world of skills and education

2 Social partners

Social partner activities will add value to embracing the uptake of digitalisation in the industry. Within their dialogue, the partners can take their natural role of facilitators towards education providers, government bodies, companies and employees.

This consists of i) making concrete recommendations on the development of education policy and curricula and ii) accompanying the digital transition on the work floor by developing facilitating appropriate training models for workers in the transition period.

3 Employees

Ongoing vocational training and LLL is a function of benefits and interests for the employees. The responsibility for it lies not exclusively with authorities and employers. Therefore, employees should participate appropriately in the effort and accept to bring in their share. Dedicating a part of their free time constitutes a good possibility for the employee to contribute to the ongoing training effort.

C Industry

Industry’s role can be summed up in C3: Cooperation, Coordination & Communication.

_Cooperation_

Employers should accelerate their engagement with schools, colleges and universities to better articulate the skills needs of industry and to encourage young people into the industry. Equally companies need to reinforce their commitment in partnerships with education and training providers.

_Coordination_

Employers must understand that the benefits of offering training and career perspectives to (future) employees are mutual and can be used to attract and retain top talent. Companies must adopt a learning approach to cope with their own organisations different (digital) learning requirements. SMEs should consider how they, with lesser resources, make themselves capable of speeding up learning.

Employers should keep an eye on the big picture and not let the need for technical skills overshadow the need for creativity and soft skills. See them as equally important and invest in them accordingly.

_Communication_

There is no point in cooperating and coordinating long-term efforts without communicating about it. This has to be done via the right channels and credible messengers, in the appropriate language of next generation - workforce, schools and other stakeholders.

By consequence, it will facilitate the upgrading of skills and qualifications of employees in the metal sector in partnership with schools.

At the end of 2015, the project partners will present their outcomes, including:

- School-enterprise cooperation model study drafted and disseminated
- Learning outcome-based COMET framework and IT tool to be developed and used by metal enterprises and schools in partnership with European experience.

The MET employers’ organisations GZS (SL), MASOC (LV), MIK (FI) & FCZ (SK) joined forces in 2013 with national VET providers and regulatory bodies.

Purpose was to identify the most pressing skill gaps and develop trainings to close those. The wider objective was maintaining a productive workforce that can successfully compete on a global level while facilitating workforce mobility, flexibility and cooperation among EU members.

SkillME developed curricula and training materials following the European-Credit system for Vocational Education & Training (ECVET) and European Quality Assurance in Vocational Education & Training (EQAVET) principles.

400 students and workers participated in pilot trainings developing their skills and increasing their competences. Since end 2017, all materials are freely available for open use and distribution on the project website. Following the success of the project, the Alliance for advancement of VET was launched to keep the momentum.

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The Bulgarian Branch Chamber Machine Building (BBCMB) supports its member companies by offering training in cooperation with specialized training providers. Are? Improve digital skills.

This essential contribution focuses on small and short-term pilot projects. These are carried out in close cooperation with the Bulgarian Academy of Sciences departments dealing with 3D models, simulations, optimisation and corresponding resolutions.

The required skill set for software development is key for the digitalisation of products and competitiveness beyond 2020. This is the next step to the following level of 4D digital imaging.

A national training network for training providers from machine building companies is being set up. The network will partner with the Bulgarian Academy of Sciences departments and other leading training providers.

By facilitating access to equipment and knowledge, the number of experts and expertise in 3D will grow. Which is necessary to prepare the next step: 4D.

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Who is Ceemet?

Ceemet represents the Metal, Engineering and Technology-based industries (MET) employers in Europe, covering sectors such as metal goods, mechanical engineering, electronics, ICT, vehicle and transport manufacturing.

Our member organisations represent 200 000 companies in Europe, providing over 17 million direct jobs and 35 million indirect jobs.

Ceemet is a recognised European social partner at industrial sector level. Our vocation is promoting global competitiveness for European industries through consultation and social dialogue.