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Key study on general needs by Vocational Education and Training towards Key Enabling Technologies

Study summary

Project:
Boosting a novel and innovative tRAining approaCh of Key Enabling Technologies - BRACKET

Project partners:

This report analyses general needs by Vocational Education and Training towards Key Enabling Technologies in six countries – Spain, Greece, Croatia, Latvia, Poland and Slovenia. The report is divided in two parts, first part analyses inclusion of KETs in documents at national level and the second part analyses data collected by questionnaire.

In Spain, Key Enabling Technologies are largely included in national laws and strategies. The framework to promote scientific and technical research, experimental development and innovation in Spain is Act 14/11, regarding Science, Technology and Innovation. KETs are also included in National Strategies – Spanish Strategy on Science and Technology and Innovation 2013-2020, The State Plan on Scientific and Technical Research and Innovation 2017-2020 and Digital Strategy for a Smart Spain, which is currently in draft.

Greek strategic documents recognize the importance of introducing new technologies into scientific activities. The most important strategic laws and documents related to Key Enabling Technologies (KETs) are: the New Strategy of Higher Education, Science and Technology 2018, the partnership agreement 2014-2020, the Greek Smart Specialization Strategy [RIS3 (2014-2020)], the Multiannual Research Infrastructure Financing Plan, the EPANEK 2014-2020 and the Strategy for Lifelong Learning in Greece and the Vocational Education and Training Development Program.

In Croatia, unlike national laws, strategic documents recognize the importance of introducing new technologies into scientific activities. The most important strategic documents related to Key Enabling Technologies (KETs) are the Strategy of Education, Science and Technology, the Croatian Smart Specialization Strategy, the Strategy for Lifelong Career Guidance in the Republic of Croatia 2016-2020 and the Vocational Education and Training Development Programme (2016-2020).

In Latvia, KET are not involved in national laws, but there are national and EU documents dealing with KETs – The Europe 2020 Strategy, The European Digital Agenda, Horizon 2020, Latvian sustainable development goals 2030, Latvian national laws ‘’About entrepreneurship and innovations’’ and European Patent Convention.

The same legislation as in Latvia is in Poland so inclusion of KETs is mostly in EU and national strategic documents. The most important KET related documents are as it follows: The Europe 2020 Strategy, The European Digital Agenda, National Development Strategy 2007-2015, National Development Strategy 2020, Smart Growth Operational Programme 2014-2020, Regional Innovation Strategy for the SubCarpathian Voivodeship for 2014-2020 for Intelligent Specialization (RIS3), Horizon 2020, The research project Ket Poland and Polish Chamber of Commerce for Advanced Technologies.

In Slovenia, the area of KETs mostly falls under the jurisdiction of the Ministry of Economic Development and Technology. One of the strategic documents related to KETs is Research and Development Activity Act. Other relevant documents in the area of KETs are The Research and Innovation Strategy of Slovenia (RISS) 2011-2020 and The Slovenian Strategy of Smart Specialization.

All of the countries listed above have well developed institutions in the KETs area, such as universities, faculties, schools, associations, Research Institutes, etc. Moreover, KETs are largely included in higher education system where the knowledge related to KETs is provided to students. However, there is still a gap in terms of Vocational Education and Training, since there is not enough training content available in terms of KETs. Nevertheless, the inclusion of KETs in general education system in these countries provides a good basis for further development.

The second part of report provides the results of the questionnaire conducted it these six countries in the period from January until end of March 2019 and gathered 140 answers – 35 in Spain, 25 in Greece, 27 in Croatia, 12 in Latvia, 20 in Poland and 21 in Slovenia. The questionnaire was divided in four parts – general skills, nanotechnology, biotechnology and advanced materials and in each part respondents had to rate importance and relevance of those skills now and in the future, degree of skill at participants' company or institution and education or training provided by VET, HE and LLL in those fields.

In Spain, general skills were mostly rated as relevant or very relevant now and in the future. Degree of those skills at participants' company or institution is rated as good or very good, while the education or training were rated between moderate and good. Regarding nanotechnology, it was rated as of average relevance now, but absolutely essential in future. Skills related to nanotechnology are mostly moderate while the VET, HE and LLL education or training provide between poor and moderate knowledge. Biotechnology is found as of average relevance now, but also absolutely essential in the future. Skills in participants' company or institution are mostly between moderate, as much as the education in those fields. Regarding advanced materials, participants found them very relevant now and absolutely essential in future. The participants skills related to advanced materials are rated between moderate and good, while the knowledge provided by VET, HE and LLL programmes are mostly found moderate.

In Greece, general skills were mostly rated as very relevant now and absolutely essential in the future. Degree of those skills at participants' company or institution is rated as moderate or good, while the education or training were rated moderate. Regarding nanotechnology, it was rated as of average relevance now, but absolutely essential in future, just like in Spain. Skills related to nanotechnology are mostly very poor, as much as the education or training provided by VET, HE and LLL programmes. Biotechnology related skills are found as of average relevance now, but also absolutely essential in the future. Skills in participants' company or institution are mostly very poor, as much as the education in those fields. Regarding advanced materials, participants found them very relevant now and absolutely essential in future. The participants skills related to advanced materials are rated very poor, while the knowledge provided by VET, HE and LLL programmes is mostly found poor.

In Croatia, general skills were mostly rated as of average relevance or very relevant now and very relevant in the future. Degree of those skills at participants' company or institution is rated as moderate or good, while the education or training were rated moderate. Regarding nanotechnology, it was rated as of average relevance now, but very relevant or absolutely essential in future. Skills related to nanotechnology are between poor and moderate, as much

as the education or training provided by VET, HE and LLL programmes. Biotechnology related skills are found as of little or average relevance now, but very relevant in the future. Skills in participants' company or institution are mostly poor, as well as the education in those fields. Regarding advanced materials, participants found them as of little or average relevance now and very relevant or absolutely essential in future. The participants skills related to advanced materials are rated between poor and moderate, as well as the knowledge provided by VET, HE and LLL programmes.

In Latvia, general skills were mostly rated as very relevant now and very relevant or absolutely essential in the future. Degree of those skills at participants' company or institution is rated as moderate or good, while the education or training were rated moderate. Regarding nanotechnology, it was rated as of average relevance now, but very relevant or absolutely essential in future. Skills related to nanotechnology are moderate, as much as the education or training provided by VET, HE and LLL programmes. Biotechnology related skills are found as of little or average relevance now, but very relevant or absolutely essential in the future. Skills in participants' company or institution are moderate, as well as the education in those fields. Regarding advanced materials, participants found them as of average relevance now and very relevant in future. The participants skills related to advanced materials are mostly rated as poor, while the knowledge provided by VET, HE and LLL programmes is mostly found moderate.

In Poland, general skills were mostly rated as absolutely essential now and in the future. Degree of those skills at participants' company or institution is rated as moderate or good, as well as the education or training provided by VET, HE and LLL programmes. Regarding nanotechnology, it was rated as of average relevance now, but very relevant or absolutely essential in future. Skills related to nanotechnology are between poor and moderate, while the education or training provided by VET, HE and LLL programmes is found moderate. Biotechnology related skills are found as of average relevance or very relevant now and absolutely essential in the future. Skills in participants' company or institution are mostly poor, while the education in those fields is found moderate. Regarding advanced materials, participants found them as of average relevance now and very relevant or absolutely essential in future. The participants skills related to advanced materials are mostly rated as moderate, as well as the knowledge provided by VET, HE and LLL programmes.

In Slovenia, general skills were mostly rated as absolutely essential now and in the future. Degree of those skills at participants' company or institution is rated as moderate or good, while the education or training provided by VET, HE and LLL programmes are found between poor and moderate. Regarding nanotechnology, it was rated as of average relevance or very relevant now and absolutely essential in future. Skills related to nanotechnology are found poor, as well as the education or training provided by VET, HE and LLL programmes. Biotechnology related skills are found as of average relevance now and absolutely essential in the future. Skills in participants' company or institution are between very poor and poor, while the education in those fields is found mostly poor. Regarding advanced materials, participants found them very relevant now and absolutely essential in future. The participants skills related to advanced materials are between poor and moderate, as well as the knowledge provided by VET, HE and LLL programmes.

Overall, general skills are found as absolutely essential now and in the future among participants, while the degree of those skills and knowledge provided by VET, HE and LLL programmes are found between moderate and very good. Nanotechnology is found as very relevant now and absolutely essential in the future, while the nanotechnology related skills and knowledge are overall rated as between poor and moderate. Biotechnology is also overall found as very relevant now and absolutely essential in the future, biotechnology related skills in participants' company or institution as poor or moderate, as well as the education or training provided by VET, HE and LLL programmes. Regarding advanced materials are overall rated as very relevant now and absolutely essential in the future. Skills related to advanced materials in participants' company or institution are found between moderate and good, while the education or training are overall rated as between poor and moderate.

The results obtained in this first output of the project will be the input for the definition of the Joint Curriculum in the second output of the BRACKET project and then, the development of the training material that should contain information both general skills and KETs information (about nanotechnology, biotechnology and advanced materials).

According to the target group needs defined in this first output, training paths will be designed in terms of necessary areas of knowledge, by providing a core training path, as well as training modules and their units to address the specific needs of certain job profiles.