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DEVELOPING A DIGITAL LEARNING PROGRAM PROMOTING DUAL VET IN RENEWABLE ENERGY AND SUSTAINABILITY WITH INTERACTIVE TOOLS DIGI-ENERGY +

INTELLECTUAL OUTPUT 1

SWOT ANALYSIS ON THE IMPLEMENTATION OF VIRTUAL
ENVIRONMENTS IN RENEWABLE ENERGIES

DIGI-ENERGY+

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EXECUTIVE SUMMARY

This report expands and collects the research produced by the partners involved in the DIGI ENERGY+ Project. These reports outline and focus on new technologies or online training in renewable energies, while, at the same time, giving a broad perspective on the current situation in each participant country. In particular,

This report contains four distinct sections:

- An analysis of New technologies or online training as an enabler of education in renewable energies, based on the research implemented by all consortium partners
- An analysis on Employability and relationship with ICT in the field of renewable energy education,
- A Good Practices section with data provided by all partners, organised per country,
- A SWOT table which is presented collectively and
- A selected Bibliography

All the above material and sections are adjunct to the deliverables of IO1.



INTRODUCTION

It has become evident from the research conducted prior but also during the first phase of the DIGI-ENERGY+ Project that there are a number of deficiencies and educational hurdles and gaps that run across the members of the consortium on a national level.

These deficiencies that still exist in this training depend on the professional families, some of which have obsolete materials and equipment, and also depend on the areas where the students are located (students who live in a metropolitan area do not have the same options as those who live in smaller cities, where the offer, the possibilities of travel and the tools are fewer).

Hence the importance of developing a learning process based on an online methodology in a practical way that helps students to have complete training whether they are at home or in the classroom and whether they are in small towns or cities. Online training is a necessary imperative in the VET area as a pedagogical imperative and, above all, as a way of adapting to the new needs of the market and of flexibility and adaptation to the situations of the different students who participate in them.

In our case, in fact, we have found through studies prior to the project that the training in renewable energies in VET in the countries that make up the project (Spain, Romania, Germany, Netherlands, and Greece) have this barrier.



NEW TECHNOLOGIES OR ONLINE TRAINING AS AN ELEMENT THAT FAVORS TEACHING IN RENEWABLE ENERGIES

Challenges Faced

The Romanian report notes that “one of the more challenging issues is the pace of change: the experience in some countries of surges in demand for skilled workforce during installation of new renewable energy capacities followed by drops in demand during its operation and maintenance is anathema to smooth transitions; it sends contradictory signals to workers and investors, as well as training institutions. Skills development systems need time to respond to the new needs and confidence that policies will sustain the transition and continue to create demand for new skills. An efficient training system for renewable energy must be integrated within overall policies to support the growth of the sector, involve social partners in the design and delivery of training, and include a good combination of practical and theoretical knowledge.”

In Greece, businesses in the renewable energy sector are at some level aware that students coming from VET may not have all the appropriate skills and competences to cope with job demands. As a result, they usually choose either to hire employees that are under – qualified and train them on – the – job, or to employ people who are certified in a close field and may partially cover their needs.¹

In Spain, there are no online Vocational Training cycles in regulated education. All official training is face-to-face and in some cases in the Dual Vocational Training modality. However, there are renewable energy courses, taught by private companies, which teach the contents of the official curriculum of the degree, so that later the students of these courses can carry out the necessary tests to obtain the degree through the free tests that the administration educational calls. These courses, in most cases, are online, and offer the possibility of internships in companies at the end of the course.

¹ NE(W)AVE: reNEWAbLe e-Vet learning, Research on Skills Needed for Jobs Related to Renewable Energy (2018)



The use of virtual reality tools is of special interest to be able to teach and train some of the usual practices in the operation and maintenance of solar and wind installations, etc.

There is also a debate about online or face-to-face training. The pandemic has shown that, Spain was not prepared for online training. The lack of resources and protocols highlighted the problems of this type of training and it seems that experience has shown that in companies where students do internships, the employer often prefers students with good skills and good practices in handling tools, measuring instruments, safety equipment, etc. These types of skills are only acquired through face-to-face teaching.

Another challenge outlined in the Spanish report is the normative aspect. The Title of the Higher Degree Cycle of Renewable Energies, in Spain, was approved in June 2011 and was implemented in the territory during the following years. It is a new title and therefore a new curriculum. Contrary to other professional training degrees, such as administrative, electrical, etc. degrees, which have been taught for many years, there is no prior experience in developing the cycle's contents. We therefore find ourselves with a regulatory framework that is still, and many years have passed, in the testing phase.

When the curriculum was created, many of the new technologies that can be used did not even exist or were in an early stage of development. We can say that we have a norm that limits the possibilities of development. In something as dynamic and changing as the business and industrial environment, consequently, professional training, the contents and methodologies must adapt to that environment, and it is also necessary to adapt the regulatory framework. The review of professional training titles must be carried out with a time frame adapted to the changes. The problem is that regulatory changes are made, on many occasions, under political views and not under technical criteria.

Finally, as the Romanian report concludes “A commitment to training is particularly important because the renewable energy sector is already experiencing shortages not only in technical occupations such as solar installers and geothermal engineers, but also in more general occupations, such as sales and finance specialists, inspectors, auditors and lawyers. To make the most of investments in renewable energies, governments and social partners need to make sure that the workforce is adequately trained.”



The Future Ahead

The renewable energy sector is growing fast: about half of the new electricity generating capacity added globally in 2008 and 2009 came from renewable energy additions. Different employment scenarios show that employment in renewable energy is expected to continue growing. This is contributing to an expected overall positive net employment growth in the energy sector as a whole while employment in fossil fuels is expected to drop in the coming years. successful transition to a low-carbon economy, therefore, depends, among other things, on the accessibility of efficient training programmes: first, for current workers in fossil fuels to smooth transitions to the growing renewable energy sector, and second, for young people entering the labour market in the energy sector.

Moreover, as stated in the German report, “The global renewable energy market was valued at \$881bn in 2020 and is projected to reach \$1,977 BN by 2030 according to Allied Market Research. That is a compound growth rate of 8.4% a year. Energy security and environmental sustainability have become an integral policy agenda worldwide whereby the global economic growth policies are being restructured to ensure the reliability of energy supply and safeguard environmental well-being as well. However, technological inefficiency is one of the major hindrances in attaining these over-arching goals. So, there is a big demand on so called green skills in Europe and worldwide.”

Concluding remarks on new technologies or online training

The Spanish report was clear and in line with all other reports: “the optimal development of this type of teaching is achieved by combining face-to-face teaching in the classroom with the best possible technological support, based on virtual reality tools, virtual platforms, where the student can find all the necessary educational materials and equipment in the centres to be able to develop the skills that we talked about before”.



EMPLOYABILITY AND RELATIONSHIP WITH ICT IN THE FIELD OF RENEWABLE ENERGY EDUCATION.

Renewable energy education, Green Skills and ICT

The Greek report mentions that “an analysis of green activities by the National Observatory for Jobs and Occupations of the Green Economy (Onemev) in France has identified two periods: a first phase (2004-11) when the green economy was ‘set in motion’ and the second (2011-14) when growth rates stabilised, with employment peaking in 2012. On the basis of these calculations, so-called ‘eco-activities’ accounted for 1.7% of total employment in 2015.² Patterns of employment in project development and in construction and installation are quite different. Work is project-based, and so continuity of employment depends on a fairly steady flow of projects.

Highly skilled people who are internationally mobile may be able to achieve this continuity by moving to wherever the work is available. Those expecting to work in their home region depend on a steady stream of project work within that area, which may not occur unless it is planned.

This is an important issue for businesses too. It is not in their interest to alternate between booms in activity when they have difficulty recruiting enough people, and busts when they may lose skilled people to other sectors where steadier work is available. When deployment of a renewable energy technology first starts in a region, it takes time to build up a supply of people with both the broad skills required and the experience and specific knowledge needed to apply them effectively. a gradual ramp up in activity is less likely to run into serious problems with skills supply than an attempt to deploy the technology at full speed from the start.³

² Cedefop (2019). Skills for green jobs: 2018 update. European synthesis report. Luxembourg: Publications Office. Cedefop reference series; No 109. <http://data.europa.eu/doi/10.2801/750438>

³ Study of occupational and skill needs in renewable energy: final report / International labour office, Ilo skills and employability Department (emp/skills). – Geneva: Ilo, 2011



This perspective was furthered and seconded by the German report. In particular, we read that Green skills are an extension of existing generic skills, those skills that the manufacturing industry has counted on for the last 60 years. But they're also much more, too, as they focus on efforts to minimize environmental degradation and save energy.

Green skills are becoming imperative to employers along with conventional hard and soft skills. Research (<https://link.springer.com/article/10.1007/s10640-020-00464-7>) indicates that the larger the distance between green jobs created and the brown jobs lost in a green economy, the more costs accrue in a community. So creating of new vet education systems and implementing the ICT in them become integral for a healthy and streamlined transition to a green economy.

Globalization, outlines the Romanian report, has highlighted the significant contribution of information technology, digitalization, and blockchain technology to economic growth (Saber et al., 2019; Oliveira et al., 2020; Borowski, 2021). The internet and advanced technologies support the flow of foreign direct investment (FDI) and trade liberalization (Bhujabal and Sethi, 2020; Borowski, 2021). In addition, these technologies also contribute to a country's infrastructure and overall productivity, which increase prosperity (Bollou, 2010; Borowski, 2021). Digitalization and ICT use increase employment, and play a very important role in reducing poverty (Coleman, 2005; Rot et al., 2020).

Economic growth is the reason for greater use of digital technology and innovation in technology (Erumban and Das, 2016). Avgerou (2003) and Jin and Cho (2015) also highlighted the significant contribution of ICT to economic growth. Information communication technology (ICT) and energy consumption have significantly increased in the past decade. ICT has become a vital aspect of enhancing many people's living standards (Moyer and Hughes, 2012). ICT comprises the internet, mobile phones, and other mediums of communication that have vital acceptability in making standard of life ICT increases the demand for smart technology, i.e., touch screens, monitors, and tablets.



The latest developments, e.g., wireless and Bluetooth technologies, enhance the effectiveness of machines and humans and increase efficiency over time. ICT is not only improving people's lives but is also enhancing the economic development of countries. As a result of ICT, communication methods throughout the world have changed, and the world has become a "global village."

ICT and digitalization also create new business opportunities and foster environmental sustainability. ICT and digitalization ensure the durability of the energy system by increasing its security and efficiency (García-Quismondo et al., 2013; M.; Rahman and Mezbah-ul-Islam, 2012; K.; Wang et al., 2018). Digital technologies and energy efficiency are vital to countering global warming, and appropriate strategies in this regard can promote effective change to the energy system (Alamouh et al., 2020; Kueppers et al., 2021). The journey toward zero emissions and sustainable development could be achieved through drastic innovation in ICT and technology to create more renewable energy options in countries at the corporate and society level, which will contribute to a sustainable environment (Borowski, 2021).

In this regard, energy service companies could play a vital role in removing the barriers to energy efficiency implementation (Recalde, 2021; Smith et al., 2021). The emergence of renewable sources and energy-efficient technologies should be adopted as a trend for climate transformation and sustainable development (Borowski, 2021). Climate and energy solutions are based on reducing the emission of greenhouse gases, and switching to efficient renewable energy options (Panwar et al., 2011; Yadoo and Cruickshank, 2012). Efficient energy use through the application of advanced technology and ICT practices could be effective in reducing its harmful effect on the environment. Hence, the use of sophisticated technologies and the block chain is a step forward towards efficient energy consumption and a sustainable environment (Silvestre and Țîrcă, 2019; Kueppers et al., 2021; Manfren et al., 2021).

This node of thinking is continued and found also in the Spanish report. We read: "It is clear that we are at a time of high employability in the renewable energy sector. Recent events in



Europe make us see the need for a change in the energy model that allows us to reduce energy dependence on third countries. The fact that employability is high cannot lead us to a certain conformism where we think that students will find work regardless of the quality of the training received.

From this point of view, the use of information and communication technologies can and should play a very important role in improving students' learning about renewable energies. In the first place, we can say that ICTs must allow us to acquire information in order to update the teachings on renewable energies.

We are at a time where new prototypes are continually being developed, new forms of use are being tried, and some of the traditional systems are beginning to fall into disuse. This dizzying pace makes it necessary for both teachers and students to be on permanent alert. It is unfeasible to wait for the educational administrations to provide us with the information and tools on the changes that are taking place in the sector.

Experience over years of teaching indicates that the teacher should be the one to take the first step towards updating, with the risk of even giving content that does not come in the official curriculum. It is at this point where ICT acquire special importance to be able to stay updated and to be able to capture resources that are useful in the teaching of renewable energies. We can say that it is the main source of information that we have.”

Use of ICT and concluding remarks

The Spanish report summarised efficiently what all partners' reports implied or highlighted: “In short, the use of ICT at the level between centres can and should serve to improve teaching. If, in addition, this collaboration could be extended to a national or even European level, as is the case with this project, the improvement could be considerable. [...] ICTs must serve as a tool for disseminating the work carried out in the centres. This dissemination must have at least three objectives:

- The first would be to encourage students to study the Higher Degree Cycle of Renewable Energies. Unfortunately, although lately it is changing, Vocational Training



still does not have the consideration and prestige in Spain that it has in other countries of the European Union. It has been for many years the great forgotten in educational matters. As we talked about before, we are at a time of high employability, the use of ICT and the dissemination of the possibilities offered by studying these teachings, can contribute to satisfying this employability with quality students.

- A second objective would be to achieve student satisfaction by seeing the result of their work embodied in projects and activities and that these projects have adequate dissemination, serving as a reward for the effort made.

The ultimate goal should be awareness. The centres that teach renewable energy can and should raise awareness that another energy model is possible, in addition to being possible, it is necessary if we want a better future.

GOOD PRACTICES IN EDUCATIONAL COMPETENCES IN THE AREA OF RENEWABLE ENERGIES IN VOCATIONAL TRAINING

GERMANY

Project: ProilPASS in the economy

The objective of this project was to introduce, evaluate and develop, if necessary, the ProilPASS as an instrument for recording competences in twelve companies. The results were scientifically evaluated by the German Institute for Adult Education (DIE: Deutsches Institut für Erwachsenenbildung) and the Institute for Development Planning and Structural Research (ies: Institut für Entwicklungsplanung und Strukturforschung). Furthermore, recommendations were compiled on the use of ProilPASS in companies and the training of advisors was modified accordingly.

Furthermore, an eProilPASS was created on the ProilPASS homepage. ProilPASS in an instrument which allows individuals to illustrate the competences acquired throughout their



biography based on self-assessment. This is performed with guidance from trained advisors in eight proposed fields of activity. In this process, special attention is given to informally acquired competences. The result of the process is an individual record of competences as a starting point for further activities.

ProilPASS contributes to the development and realisation of the potential of the labour force within the German economy. 78% of the participants became aware of what they were capable of by using ProilPASS2. They were able to label their competences and to communicate their development objectives. Employees take on more responsibility for their vocational development and become motivated about lifelong learning which means they participate more in VET.

Model “Modular qualification process taking account of previous professional experience” VmQ (BBJ SERVIS gGmbH)

The VET model VmQ (Verfahren modularer Qualifizierung unter Berücksichtigung beruflicher Vorerfahrungen)³ aims to simplify access to VET for unskilled and semi-skilled workers. It also aims to allow fitting career entry points and adequate solutions for attaining vocational qualifications using the regulations of the external students' examination. The approach of VmQ is innovative in that informally acquired professional knowledge and skills are systematically identified in a determination procedure and are also considered when planning VET. The determination procedure and the corresponding VET is based on a modular qualification concept (e-learning possible). The duration of training is dependent on individual previous experience. The existing competences or those acquired in VET are certified module by module in a Qualification Passport. This process allows the target-oriented fulfilment of the admission requirements for an external students' examination. Involvement and support of governmental and non-governmental institutions

The Qualification Passport is administered by educational institutions, qualification partners and companies who have committed themselves to the standards for certification which have been agreed upon with the Federal Institute for Vocational Education and Training for certifying modules for later qualification and VET.



With VmQ, as an example, the admission to an external students' examination in accordance with § 40.2 BBiG and § 37.2 HwO is no longer quantitative but is instead based on qualitative criterion (assessment of competences). This includes substantial benefits for both those who are learning and also for companies. It allows unskilled and semi-skilled employees to gain formal recognition of their competences, which is still prioritised in Germany, by passing the external students' examination. Even upon failure of the examination, their competences have been documented nonetheless.

Furthermore, VET can be carried out on a needs-based and flexible manner. It should be oriented towards the identified individual qualification needs and requirements of semi-skilled and unskilled workers as well as towards the ever increasing company demands which result from economic and technical developments. The scope and duration of continued training can be determined individually so that learners can save on qualification time depending on the results of the determination procedure. VET in itself can thus ultimately become more cost effective for the learners and companies since only the modules which are actually necessary for achieving the qualification goals are completed.

GREECE

GSS-VET – Geothermal and Solar Skills – Vocational Education and Training ⁴

The EU's strategy for sustainable growth, Europe 2020, puts innovation and green growth at the heart of its blueprint for competitiveness, leading to a whole new demand for environmental skills in the construction sector.

However, training providers have not yet caught up with this new skills demand, creating an important skills gap in the current labour market, as highlighted in the "Green skills and environmental awareness in vocational education and training" report from CEDEFOP.

⁴ <http://gss-vet.eu/>



Following the identification of skills needs, the partners created an innovative training including work-based learning, ubiquitous learning and flipped classroom for geothermal and for solar energy system installers (EQF level 4-5). The training content is focused on technical skills but also on transversal ones, including entrepreneurship, ICT, interdisciplinary skills and ability to work effectively with people from other disciplines.

For the above an e-Learning Platform was designed with corresponding digitalized contents. 40 trainers and 200 workers were directly trained during the project's lifetime, and thanks to the involvement of VET providers, sectorial organizations (including an EU umbrella), regional authorities and other associated partners, 2,500 workers will be trained by 2025.

BUILD2LC⁵

The key innovative aspect of BUILD2LC is its multidisciplinary approach, that counting on different complementary expertise at local (Gloucestershire County UK, and Gorenjska SI), regional (Andalusia ES, Rzeszow PL, North-West Croatia and Jämtland Region SE) and national (Lithuania) level, will allow achieving the energy goals and a sustainable development of the construction sector, based on improving the competitiveness, generating qualified employment, promoting innovation, and alleviating energy poverty, in line with the European objectives for smart, sustainable and inclusive growth.

The project with a high replicability impact will design innovative financial instruments, adapted to the needs of citizens, new mechanisms that contribute to a more competitive business network, special programmes to support innovation, and innovative collaboration actions, focusing on vulnerable groups. Home-owners, business sector, policy makers, local authorities, knowledge institutes and vulnerable groups will benefit from the project.

The project will develop a complete learning process to facilitate an effective knowledge flow among regions, with a bottom-up approach methodology, counting on the regional stakeholder groups. More than 70 best practices and almost 70 events involving nearly 400 stakeholders,

⁵ <https://projects2014-2020.interregeurope.eu/build2lc/>



will establish 7 Regional Action Plans covering a population of more than 15 million inhabitants and improving energy efficiency over 25% at the participating regions.

The key innovative aspect of the project is its multidisciplinary approach in the frame of the sustainable construction sector, including financial schemes, capacity building, innovation, awareness raising and combating against energy poverty, amongst others. It is necessary to progress simultaneously in all these fields to promote improved energy efficiency of buildings and consolidate a solid development of a business sector linked to energy rehabilitation.

The BUILD2LC project aims to ensure the real impact of the achievements in the long term, that will be achieved through new and innovative initiatives put in place, which will be adapted to the local needs and expectations of society. All the participating regions have specific funds in their operative programme of ERDF funds for energy rehabilitation and energy planning tools with objectives set on energy efficiency and renewable energy, ensuring the visibility of the improvements foreseen in the BUILD2LC project.

NE(W)AVE ⁶

Renewable Energies is a growing and profitable industrial sector in Europe. But in spite of its importance and great expectations of continuing growth, there is still a lack of skilled employees. Very often installation and maintenance services are in the hands of young people without a specific training.

NE(W)AVE's project aims to create, test and implement a comprehensive learning model for the future professionals in the renewable energies. The project foresees that young VET graduates or about to graduate can follow an online course that allows them to update and focus their skills on renewable energy.

Skills that will not only be theoretical but above all practical. Through this course, people trained, will also have the opportunity to complete a period of mobility in Spain and Italy hosted by two companies.

⁶ <https://newaveproject.eu/>



GRÆ EDUCATION ⁷

With regard to VET and green occupations, the German-Greek project GRÆ EDUCATION from 2017 represents an interesting example, as it aims to contribute to the development of dual vocational education and training in the field of green professions and to a more intense dialogue between companies and educational institutions.

The project, due to be finished in 2020, actively addresses shortcomings present in the 'green entrepreneurship' sector in Greece by creating innovative and tailored education services and exchanging ideas and best practice among German and Greek partners. Greece has a great potential in the field of renewable energies, even though the focus of production still lays on fossil fuels. As it is the reality for most European countries, the heavy focus on fossil fuels will slowly but surely shift towards renewable energy, which in Greece could represent an attractive market for potential investors. This shift however requires a high-quality and professional qualification in the field.

ROMANIA

The recent framework strategy of the “Energy Union” of the European Commission indicates that 75% of European households are energy inefficient. There is also great potential for energy savings in public buildings of the EU. The **BUILD2LC** project will contribute decisively to achieve the EU energy goals, with its overall objective to increase the energy rehabilitation of buildings, and pave the path that facilitates the transit towards the new standard of nZEB buildings.

The key innovative aspect of **BUILD2LC** is its multidisciplinary approach, that counting on different complementary expertise at local (Gloucestershire County UK, and Gorenjska SI), regional (Andalusia ES, Rzeszow PL, North-West Croatia and Jämtland Region SE) and

⁷ <https://graeducation.org/el/home/>



national (Lithuania) level, will allow achieving the energy goals and a sustainable development of the construction sector, based on improving the competitiveness, generating qualified employment, promoting innovation, and alleviating energy poverty, in line with the European objectives for smart, sustainable and inclusive growth.

The project with a high replicability impact will design innovative financial instruments, adapted to the needs of citizens, new mechanisms that contribute to a more competitive business network, special programmes to support innovation, and innovative collaboration actions, focusing on vulnerable groups. Home-owners, business sector, policy makers, local authorities, knowledge institutes and vulnerable groups will benefit from the project.

The project will develop a complete learning process to facilitate an effective knowledge flow among regions, with a bottom-up approach methodology, counting on the regional stakeholder groups. More than 70 best practices and almost 70 events involving nearly 400 stakeholders, will establish 7 Regional Action Plans covering a population of more than 15 million inhabitants and improving energy efficiency over 25% at the participating regions.

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SPAIN

For some years now, international and also national organizations that are dedicated to the evaluation of teaching practice have placed greater emphasis on assessing educational systems, not from the point of view of checking how much knowledge the students have acquired, but above all they have valued how the students have acquired the necessary skills to apply that knowledge.

In recent years, many studies and projects have been developed to guide teachers in the development of good practices for the acquisition of basic skills. But of course, all these works have been developed for students of high school student and not for vocational training. In these studies, good practices are experiences considered exemplary that guide educational action supported by actions already carried out.

The fundamental idea of good practices is to flee from rote models that have been and still are the predominant models in education. From this point of view, Vocational Training has a great advantage over the rest of secondary or high school education, since the practical component of these teachings means that the memory resource is less.



Does this mean that it is not necessary to apply good practices in the teaching of Vocational Training and specifically in the teaching of renewable energies?

Obviously, the answer is no. What is a good practice?

The "good teaching practice" is a set of actions carried out by teachers by introducing improvements in relationships, processes and activities; all this aimed at producing positive results, in our case, in the acquisition by students of the skills considered basic.

From our point of view, good practices should follow these strategic lines:

- Planning. In the first place, good planning must be carried out at the level of the Department of Renewable Energies and also at the individual level of each teacher.
- Adjust the curriculum to the Center's resources. Normally, there are not enough resources available. We will have to give priority to those contents for which we have resources. For the rest of the content, look for the best strategy to be able to impart it.
- Plan spaces. The scope of the workshop is an area where theoretical and practical teachings coexist. From this point of view, the ideal is to ensure that the means of the workshop (tables, trainers, computer equipment) have certain flexibility, that is, that with the means and resources they can be easily adapted to new scenarios during the course. For example, the trainer that is used during the first term and is no longer used, may not be occupying a main location within the workshop for the rest of the course, but must be moved and replaced by other trainers or equipment.



- Motivate students. Actions must be carried out that ensure that the students acquire a certain autonomy when learning the contents. We should not get students who are mere reproducers of something they have read. The development of small projects at the classroom level is a very powerful tool that allows the student to develop skills on their own.
- Encourage the development of group work. Vocational training is the immediate step into the world of work. When the student enters the company, he will be one more link in a group of people who work as a team. It is important that from the centers we are able to develop group work skills. Learning through projects, which we mentioned in the previous section, can also be a very powerful tool for achieving group skills.
- ICT use. Obviously, Vocational Training, like other teachings, cannot be left out of technological development. The use of these new tools not only improves the teaching activity, but also motivates the student.

To finish this section we cannot forget perhaps the most important aspect in the development of these good practices: their evaluation. Evaluation indicators for these practices must be established. These indicators can be varied, from the group's own academic performance, as indicators of satisfaction of the teaching staff, students, impact on the Centre or on the environment, etc.

DAFO ANALYSIS - (WEAKNESSES, THREATS, STRENGTHS AND OPPORTUNITIES) (COLLECTIVE)



STRENGTHS

- New green jobs tend to evolve as skills are topped up in existing jobs, or as competences applied across traditional sectorial distinctions
- There is ample room for innovation in the field since skills and trainings can be utilized interchangeably
- DigiEnergy+ is a unique chance of merging the current state of skills with the emerging technologies put to practice in the last 2 years
- Similar programs available, which contain either important vet aspects or online tools. And most organizations, which provide them are open for cooperation
- Business associations and entrepreneurship networks offer opportunities for peer-learning.
- Bigger companies, but also start-ups have a demand and are interested in the outcome of the project. Also, they are generally able to access a wide variety of financial supports to implement and improve them
- The regulatory environment is generally supportive of an online vet.
- The main strength of online teaching is to be able to have a greater reach of potential students
- Through online teaching we move in a virtual environment, with close contact with the new communication channels, social networks, etc., and it is easier to spread the work that is done and collaborate in the necessary awareness of society to change the current energy model.

WEAKNESSES

- The EU suffers from systemic weaknesses in its skills base which limit its productivity and competitiveness in today's economy, and reduce its capacity to exploit the opportunities offered by green growth
- The number of trainers and teachers able to teach new techniques and aware of environmental issues is not sufficient, and shortages are particularly acute in agriculture and the construction sectors – more emphasis needs to be placed on training the trainers
- The current education system mainly promotes a classic model of vet
- The education system does little to encourage to choose an innovative way of vet and to start it in the field of renewable energies
- Financing programmes for support of the trainees are not available yet.
- The certification of the learners is not clear and not widely recognized yet.
- High price of green energy and its dependence on governmental subsidies.
- Temporary teaching staff with no fixed contract



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OPPORTUNITIES

- There are some areas in which significant investment in skills delivery will be needed, mainly because of the scale of action required. This is most notable in energy efficiency and construction of zero-carbon homes, both of which are heavily driven by national legislation
- Continuing initiatives for targeted support and promotion of STEM in compulsory-level education are needed
- Renewable energy is the primary focus of recent environmental priorities, together with energy efficiency especially in buildings
- Support for innovative vet education (at all levels) is growing and as a result, there are many EU initiatives and funds available to support further development in this field
- The project Digi-Energy+ provides an opportunity to increase the promotion of vet education.
- International cooperation and synergy
- Some parts of the program could be integrated in the “classic” vet education
- Capacity in the vet and in the renewal energy fields have a big potential
- Be constantly updated with new technologies
- Optimize resources
- Expand the range of students with different ages

THREATS

- In some countries, there is a shortage of engineers able to replace those retiring, resulting in a shortage of people with the skills to deliver major infrastructure projects
- There’s not a comprehensive skills training strategy identifying skills needs for the occupations involved in most EU countries
- Bureaucracy and outreach to trainers
- The “classis” vet education still plays a big role and could be hardly substituted by online learning
- There is not enough equipment and facilities to implement the practical part of the education
- Lack of consensus among policymakers
- Detection of learning problems by students



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