

RECOGNISING NEW TRENDS IN VET TOWARDS GREEN TRANSITION: EXPERIENCE FROM NORTH MACEDONIA

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Abstract

Rapid technological, economic and social development requires inevitable changes and improvements, while sustainable development, environmental awareness and principles are increasingly becoming part of organisations' long-term strategies. The increasing benefits that come with the implementation of green approaches and concepts by connecting technology, innovation and sustainability are being more broadly recognised. The current global goal is to adapt existing and emerging technologies to satisfy both companies' and customers' needs, with minimal or no impact on the environment. Taking into account the continuous changes and the will for flexibility and timely reaction to them, there are needs to upgrade the existing knowledge and skills. Educational systems should be capable to react quickly to the changes and adjust their educational programmes in order to deliver a competent workforce. Greening of the existing occupations is highly recommended and vocational education and training (VET) have to be in line with industry needs and the demands of the labour market.

In North Macedonia, vocational education and training are regarded as second-tier pathways to adulthood, designed for learners from less advantaged backgrounds. More than ever, employers from the industry are worried about the lack of well-trained and competent human resources who are willing to cope with today's challenges and constant changes. In this paper, authors identify the trends in vocational education and training that enable or hinder the green transition in North Macedonia. For that purpose, a survey with more than 90 industry representatives, professors/teachers/educators and other stakeholders relevant for achieving green future, has been conducted in the period from January-August 2021. The survey analyses what is missing, what should be further developed and how to achieve the desired goals for improving vocational training in line with the green transition. Recommendations derived from the research will be submitted to the team responsible for development of a smart specialisation strategy (S3) in North Macedonia, as a potential response to the challenge of achieving structural changes for supporting knowledge-driven growth and technological, practice-based and social innovation. This research was conducted within the project "European VET Excellence Platform for Green Innovation", co-funded by the Erasmus+ programme of the European Union (www.greenovet.eu).

Keywords: green transition, green competences, vocational education and training.

1 INTRODUCTION

Great minds develop great innovations and technology is rapidly changing. The continuous development and growth require changes and improvements, while sustainable development, ecological principles and environmental awareness are increasingly becoming part of the long-term strategies of various organisations. The benefits that emerge with the implementation of green approaches and concepts are increasing, and both public and private sectors are beginning to understand the undiscovered opportunities for economic growth by connecting technology, innovation and sustainability [1]. In earlier times investing in sustainable and ecological processes has been considered unnecessary, but the world we live in today places exactly those investments as a priority to ensure success, well-being and sustainability, as well as a competitive advantage [2]. The current green and digital transition requires new technologies, new products and services [3]. However, greening of the existing economy and the contemporary society has an impact on the existing occupations, professions and required skills and competences [4]. Taking into consideration the continuous changes and the intentions for timely reaction to them, there is a need to upgrade the existing knowledge and skills [5] [6]. Lifelong learning is of a great importance in the educational processes and is considered an essential aspect of sustainable development and green transition [7], denoting a general term that refers to any learning-related activity

that individuals engage in throughout their lives [8] [9]. Moreover, Europe allocates significant number of resources for improvement and promotion of vocational education and training (VET). Learners need to access high-quality VET education that offers both theoretical and practical lectures in line with the industrial needs, because the advanced VET systems can lead to higher levels of employability and capacities to respond quickly to the changing trends [6]. However, there is no unambiguously defined model for successful education and learning about environmental sustainability due to the fact that different organisations need to adapt the content and pedagogical methods in accordance with the learners' interests. In this regard, the European Commission has set the concept of Smart Specialisation Strategy (S3) which represents a knowledge-based growth strategy and a serious foundation for sustainable development by identifying strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process (EDP) with wide stakeholder involvement. By encouraging learners to seek critical information, to focus on innovation and to identify needs for change while considering the human's and Earth's well-being, education significantly supports sustainability, responsible and ecological thinking [10]. With support from the European project GREENOVET, the first regional Centre of Vocational Excellence (CoVE) in green innovation was established in North Macedonia in December 2021, as a body within the Faculty of Mechanical Engineering-Skopje, Ss. Cyril and Methodius University in Skopje. This research indicates the current situation in North Macedonia, the elements that are missing and need to be further developed in order to encourage implementation of green concepts and development of green innovation. Moreover, it suggests measures that should be taken and services that could be provided by the regional CoVE for fostering the green transition.

2 METHODOLOGY

The methodological part is enrooted in the tailor-made methodology followed within the GREENOVET project for conducting strategic research. This research is performed through three main phases: 1) organisation of regional workshop, 2) conducting semi-structured interviews, 3) conducting quantitative survey, with the main aim to identify the current educational trends that enable or hinder the green transition in North Macedonia. The first two phases are considered preparatory for development of well-structured and less time-consuming quantitative questionnaire. Firstly, the regional workshop gathered together relevant stakeholders from all quadruple helix areas in order to initiate thinking and to encourage discussion on the knowledge, skills and competences that are relevant for getting closer to a greener future. As a continuation of the preparatory phase, semi-structured interviews with representatives from 2 educational institutions and 6 companies from the preliminary priority areas defined during the development of the national Smart Specialisation Strategy were conducted. Due to the fact that the S3 in North Macedonia is still in the process of development, this research took into consideration the mapping of the economic, innovative and scientific potential in North Macedonia, as a foundation of the strategy, for identification of priority areas for development [11]. This research divides the relevant skills for green transition into two main groups: generic skills and technical skills and/or occupations [12]. The proposed generic skills involve four already developed European Competence Frameworks: Entrepreneurship Competence Framework – EntreComp [13], Digital Competence Framework for Citizens – DigComp [14], Framework for Personal, Social & Learning to Learn Key Competence – LifeComp [15] and Key Competences for Lifelong Learning [9]. In regard to the technical skills, the biggest identified challenge was the lack of uniformly defined technical skills that could be the starting point for the identification of skills that are relevant for green and sustainable development. Therefore, the main aim of collecting data through face-to-face interviews was to identify both technical and generic skills that need to be measured further in the quantitative analysis in order to detect the current trends and skills gap in regard to green transition. Finally, the content of the questionnaire was developed in line with the results obtained from the regional workshop and the semi-structured interviews. The questionnaire was well-structured by using the online survey software QuestionPro and resulted with 92 relevant responses.

3 RESULTS

3.1 Regional workshop

The regional workshop in Skopje, North Macedonia was organised in January 2021 with 35 stakeholders. It was structured in two parts: presentation and introduction to green concepts, green innovation and the S3 concept, followed by more inclusive part with parallel sessions which offered an opportunity for participants to discuss and express their opinions on the existing skills, missing skills,

those provided by the VET institutions and those that should be further developed in order to achieve a green and sustainable future. The main conclusions reveal that Macedonian VET institutions support critical thinking, focusing on new challenges, development of digital and technical competences, but that the soft ones need to be further developed. Besides, VET providers should be more focused on new, green technologies within their educational process. It was stated that the most relevant knowledge and competences for green transition that are acquired by VET students come from the cooperation between the business sector and the VET institutions. However, bigger cooperation between VET schools and the non-governmental sector, as well as even greater use of European and other donor funds for development of green projects is more than necessary. The capability of understanding the environment, also the work environment, and the cooperation between all stakeholders were especially emphasised elements that affect the green transition.

3.2 Interviews

During the research, eight interviewees were involved: six from the industry corresponding to the defined preliminary priority areas within the national S3, one VET school and one Higher Educational Institution (HEI), Table 1. As each VET provider and HEI has its own area of teaching, studying and researching, Table 1 presents the relation between the selected educational institutions and the promising industry areas mapped during the development of the national S3. The respondents carefully analysed what is missing in their industry that hinders the transition towards a green future. Since this research starts from the matter that many technical skills are occupation-dependent, the interviewed stakeholders mostly suggested occupations relevant for green innovation that are missing in their surroundings. Those occupations might be considered further in the future research in order to identify the occupation profile and technical skills that come along with them. The final data set from the interviews has been analysed to define a list of missing technical skills and/or occupations relevant for green innovation and to narrow down the list of generic competences from the European competence frameworks to 15 most important for green innovation. This activity was recognised as necessary for providing a link between the technical skills originating from the S3 priorities and the generic skills, and also, for developing a quantitative questionnaire that will contain list of skills and technical occupations, so the final survey will be well-defined, less time consuming for the respondents and based on qualitative analyses.

Table 1 Interviewees per S3 preliminary priority area

| <i>S3 mapping Priority area</i> <i>Type of organisation</i> | <i>Sustainable food and beverage production and value chain</i> | <i>The ICT sector</i> | <i>Smart/ sustainable buildings and materials</i> | <i>Electrical equipment & machine parts</i> | <i>Sustainable tourism and hospitality</i> | <i>Energy for the future</i> |
|--|---|---------------------------|---|---|--|----------------------------------|
| Company | | | | ✓ | | |
| Company | | | | | ✓ | |
| Company | | | ✓ | | | |
| Company | | | | | | ✓ |
| Company | | ✓ | | | | |
| Company | ✓ | | | | | |
| VET school | | | | ✓ | | |
| HEI | | | | ✓ | | |

3.3 Survey

The survey was conducted over a period of month and a half. The respondents who took part in the survey were asked to rank both technical occupations and/or skills, and generic skills, for enhancing green innovation by assessing them on a six-point Likert scale. Right next to each occupation and/or skill and the assessment scale, a drop-down menu offered suggestions for choosing the most appropriate way through which that occupation and/or skill could be addressed by educational institutions, the CoVE in green innovation and other relevant organisations. Once the data sets were collected, they were properly filtered and the whole analysis was performed on 92 completed answers. The survey was comprehensive, involving representatives from organisations of various industries presented in Fig 1. Moreover, some of the organisations might belong to several categories. Namely,

one organisation might identify itself as both company and a VET provider if it offers vocational education and training. Most of the organisations that have answered the questionnaire are of a medium size (36%), with 50 to 249 employees. Regarding the companies, 60% of those that answered the survey belong to the proposed S3 priorities. The other 40% are relevant companies and organisations that have the necessary expertise or separate departments relevant for green technologies and innovation.

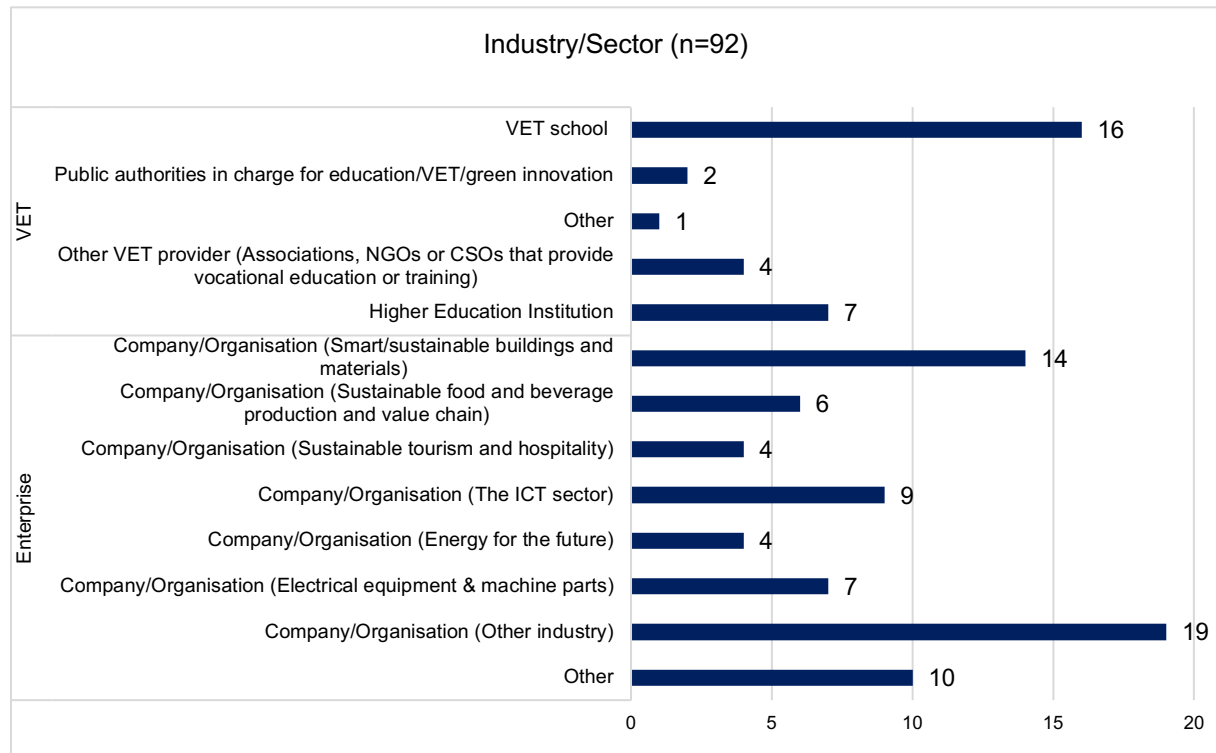


Figure 1. Respondents per type of organisation (NMK)

3.3.1 Technical professions/occupations relevant for achieving green transition in North Macedonia

Fig. 2 presents the 15 technical professions/occupations and/or skills identified as relevant for green innovation and more generally, green transition, ranked from highest to lowest. The missing technical occupation which is considered most relevant and should be developed in North Macedonia is waste recycling, with average score of **4.91**. Considering the outcome, it is noticeable that the focus is on waste recycling and waste management, as well as rational use of energy and greater expertise in renewable energy. As the respondents had an opportunity to suggest additional technical occupation which they consider relevant for green transition, but is not part of the provided list, the survey resulted in a couple of suggestions that do not differ much from what is proposed in the list. Most of the additional suggestions are related to waste management and rational use of energy (e.g., environmental protection, sustainable development, monitoring the environmental pollution, repair and redesign of old furniture). Another important concept that is proposed to be implemented in each organisation is the circular economy. This systematic approach is closely related to the proper waste management and the wise utilisation of resources.

The findings of this survey are the foundation of VET excellence, a better and a greener future. Each respondent provided an opinion regarding the way through which each of the proposed technical occupations could be addressed by the educational organisations, the regional CoVE and similar relevant institutions. The results show that policy measures for educational improvements are more than necessary in order to reach the desired green VET excellence. Most of the respondents believe that extending of the existing curricula or creating new educational programme are the best ways for addressing each technical occupation by the relevant organisations.

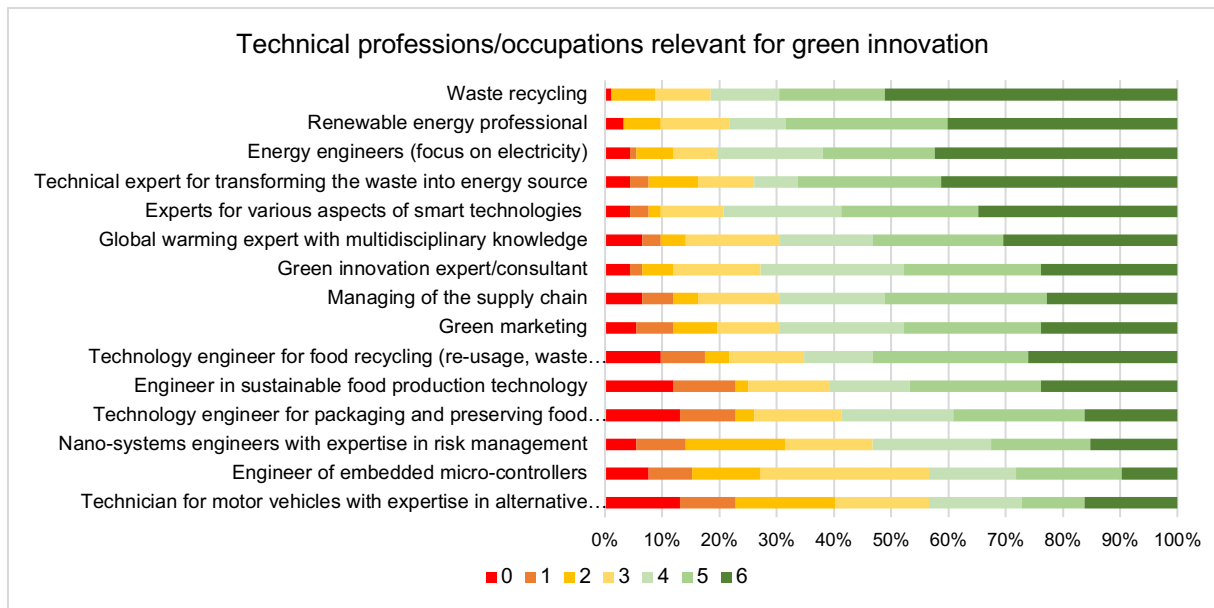


Figure 2. Technical professions/occupations relevant for green transition, ranked from highest to lowest (NMK)

3.3.2 Generic skills relevant for achieving green transition in North Macedonia

Although the proposed occupations and/or technical skills and the obtained results clearly show what expertise and what kind of staff development is needed, generic skills also play a key role in the overall growth. The green colour is notably dominating in Fig. 3. The highest ranked generic skill is protecting the environment with average score of **5.36**, while the lowest ranked one is identifying needs and technological responses with average score of **4.26**. The slight difference between the highest and the lowest ranked skill confirms that all generic skills are considered very important and should be developed in different ways. Similar to the results gained for the technical occupations, the extension of the educational programmes is also emphasised as the best way for addressing most of the generic skills. Nevertheless, the survey shows that creating new educational programmes is not the solution for development of the necessary generic skills. New contents in the already existing ones, as well as training and courses leading to a non-formal qualification are considered to address the generic skills more effectively.

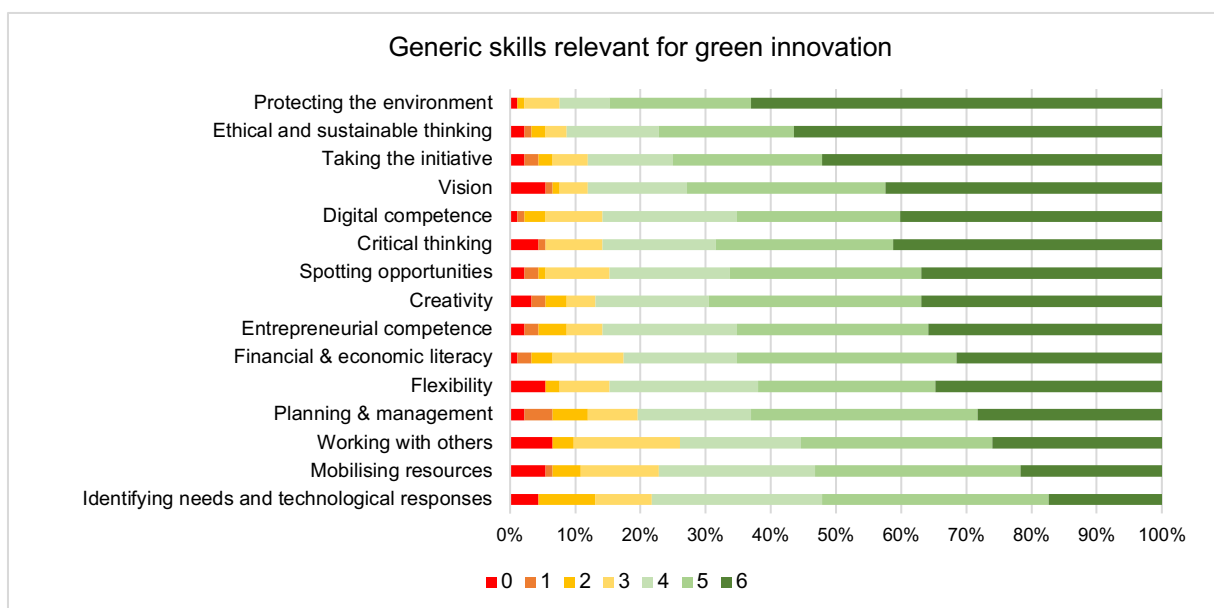


Figure 3. Generic skills relevant for green innovation, ranked from highest to lowest (NMK)

3.3.3 Potential benefits of the Centre of Vocational Excellence in green innovation in North Macedonia

Fig. 4 illustrates which of the potential CoVE services could be useful for the respondent's organisation, thus presenting what is missing and should be further developed to achieve the desired green future and competent human resources. There is only a slight difference between the interests for each potential CoVE service, which is a proof that the considered activities and services are highly relevant and important for the key stakeholders. The participants believe that the biggest advantage for them would be creation and maintenance of successful collaboration with the industry. Moreover, the respondents believe that the regional CoVE could foster consideration of reduced taxes or other benefits from the state for the industry, i.e., the legal entities, based on a green economy.

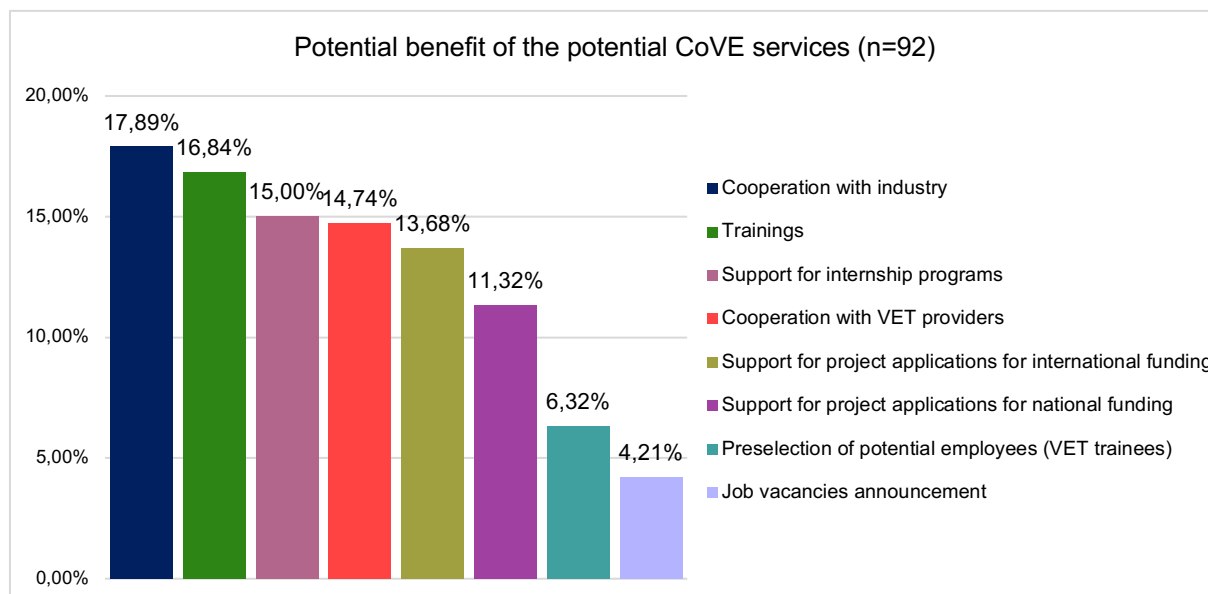


Figure 4 Potential benefit for respondents' organisations of the potential CoVE services (NMK)

4 CONCLUSIONS

The activities for collecting relevant data in regard to achieving VET excellence for smoother green transition were carried out with full commitment and attention. Significant inputs were provided by experts from the industry, educational and non-governmental institutions. The main findings of the research point out that there is a need for further development of both technical and generic skills that are relevant for implementation of green concepts and approaches, as well as development of green technologies and innovation.

The most appropriate way to address most of the missing technical occupations and/or skills is by extending the existing educational programmes with new content. However, for addressing some of them, our educational system is lacking a proper programme and teaching subjects. Future studies may reflect on how to create general occupation profiles for the most relevant green occupations. On the other hand, creation of new educational programmes is not considered necessary for developing generic skills that will foster green innovation. The outcomes show that the curricula should be more flexible and extended with new content in order to create capable and environmentally responsible employees.

This paper provides brief overview of the activities that help to identify the trends in VET towards green transition, as well as reflection on the current status in North Macedonia on this topic. The inclusion of relevant stakeholders from all quadruple helix areas is more than necessary when there is a need for changes and improvements. Recommendations derived from the research will be submitted to the team responsible for development of the S3 in North Macedonia, as a potential response to the challenge of achieving structural changes for supporting knowledge-driven growth and technological, practice-based and social innovation. Moreover, the results will assist the educational organisations and policy-makers in achieving higher promotion and attractiveness of the vocational education and training, as well as overall improvement of the educational system.

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