Education and Awareness

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Building the Road to Green Entrepreneurial Orientation in Higher Education and Research: Sharing Experience and Looking Ahead

Abstract

The Green Entrepreneurial approach is an important trend in strengthening education and research in Europe and in the world. The article examines a concept of *green entrepreneurship* and development of "skills ecosystems" as a dimension in university education and research. This methodology serves as a tool for integrating a number of main goals focused on providing high quality vocational skills to young people and contributing to regional development, innovation, smart specialisation and social inclusion. The article discusses how educational institutions must respond to the challenges in providing a high-quality research-training environment. The authors show that the establishment of *dual education and related research* at university level is an evident strategy for higher education institutions as this will give students an opportunity to acquire solid knowledge about subject matters and contribute to build a stimulating research environment. This contribution aims to offer insight into the implications in relation to the need to expand and adapt the content and the approach of Green Entrepreneurship and innovation in dual educational programmes and research in the EU and Latvia.

The development of analytical skills and specialist knowledge promoted by *dual education* is a particular asset in areas, where in-depth knowledge of the green entrepreneurial orientation approach is key to research excellence.

Keywords: green entrepreneurship, research, universities, dual education.

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Introduction

In contemporary times, multiple crises crossing geo-political security, economic, social, public health, and environmental realms have renewed the incentives for harmonised policy responses in the EU to support societal transformations for sustainability. In the context of geopolitical crises strategies and economic turmoil, decarbonizing the EU economy were debated in the European Green Deal (EGD), a 'green growth' strategy. Additionally, the crises of skyrocketing energy prices and insecurity of supply due to the Russian-Ukrainian war have put the energy transition at the top of EU's priorities[1]. In light of varying capacities of the EU Member States to respond to the short-term and longer-term economic and environmental difficulties, concerns for transition of educational programmes and educational research in the context of 'green' entrepreneurship and innovation are of prime importance.

The European Commission (EC) proposes transformation of EU economy and society to meet climate ambitions, and on 14 July 2021 the European Commission adopted a set of proposals to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Achieving these emission reductions in the next decade is crucial to Europe becoming the world's first climate-neutral continent by 2050 and making the EGD a reality.[2] However, the 'green growth' debate is taking place in a generalised setting, for example, largely disregarding the innovation factor. According to EU climate chief Frans Timmermans, green development is "…going to be a long and difficult journey and COP27 deal still needs a tremendous amount of work".[3]

In this article, we consider the 'green entrepreneurial' approach as an important trend in strengthening education and research in European higher educational institutions. The importance of education is stressed by the UN Action for Climate Empowerment (ACE), as an over-arching goal to engage in climate action, through the six ACE elements - climate change

1 REPowerEU: Joint European Action for more affordable, secure and sustainable energy (2022). European Commission, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A108%3AFIN.

2 European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions. European Commission. Press release. 14 July 2021. https://ec.europa.eu/commission/presscorner/detail/en/IP_21_354

3 Frans Timmermans. COP27 Climate Summit. A press conference in Sharm el Sheikh, Egypt. EU Observer 18 November 2022.

education and public awareness, training, public participation, public access to information, and international cooperation on these issues.[4]

The article examines the concept of 'green entrepreneurship' and development of 'skills ecosystems' as a dimension in university education and research. This methodology serves as a tool for integrating a number of main goals focused on providing high quality vocational skills to young people and contributing to regional development, innovation, smart specialisation, and social inclusion. The study discusses in which way higher educational institutions must respond to the challenges in providing a high-quality research-training environment. The authors have been inspired by the content of the EU 3LoE "Three-level centres of professional excellence: Qualification, entrepreneurship and innovation in the Green Economy".[5]

The authors argue that the establishment of dual education and related research at a university level is an evident strategy for higher education institutions nowadays, as this will give students an opportunity to acquire solid knowledge about subject matters and contribute to build a stimulating research environment.

This contribution aims to offer insight into implications in relation to the need to expand and adapt the content and the approach of green entrepreneurship and innovation in dual educational programmes and research in the EU and Latvia. The development of analytical skills and specialist knowledge promoted by dual education is a particular asset in areas, where in-depth knowledge of the green entrepreneurial orientation approach is key to research excellence.

I. Understanding of the Green economy and green entrepreneurship concept

1.1. Green entrepreneurial orientation and the concept of green innovation

Increasingly, environmental issues are posing serious threats to ecology, humans and economic growth. Governments and businesses focus nowadays

4 UN Action for Climate Empowerment. https://unfccc.int/ace.

5 The 3LoE "Three-level Centres of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy" aims at development and implementation of dual vocational training in education, training and higher education, with an intensive partnership between the places of learning (companies – education centres). European Commission. Erasmus+. Hanse-Parlament projects https://3-loe.eu.

on more sustainable productions and integrating sustainable processes in core of their business activities.

Studies suggest that an entrepreneurial orientation (EO) has emerged as a core concept in the field of entrepreneurship[6]. In this context, in realising environmental, economic, and social performance of businesses, a green entrepreneurial orientation (GEO) and or sustainable entrepreneurial orientation (SEO) are considered as sustainable competitive advantage[7]. For many firms GEO enhances their capabilities to initiate green ventures and improve business performances and sustainability performance.

Transition to green economy is a dominant part of the EU`s economic development. The European Green Deal that strives to transform the EU into a climate neutral and resource efficient economy by 2050[8] has placed green economy in the focus of all national governments of EU member states. Implementation of the European Green Deal will provide new opportunities for innovation, investment, and jobs. Green entrepreneurs are recognized as a key driving force to foster transitions to green economy. Green entrepreneurs are implementing strategies that aim to reconcile tensions between business activities and environmental objectives in a contrast to entrepreneurs operating "business as usual".[9] An essential starting point governing green entrepreneurs is a "green growth" paradigm. In scientific literature "green growth" is associated with climate stabilization as an accelerator for innovation, investment, economic growth and related to political activities on national and regional levels[10].

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6 Lumpkin, G. T. Pidduck, R.J. (2021) "Global Entrepreneurial Orientation (GEO): An Updated, Multidimensional View of EO" in Corbett, A.C., Kreiser, P.M., Marino, L.D., Wales, W.J./Ed. *Entrepreneurial Orientation: Epistemological, Theoretical, and Empirical Perspectives, Advances in Entrepreneurship*, Firm Emergence and Growth, Vol. 22, Emerald Publishing Limited, Bingley, pp. 17-68.

7 Afum, E., et al., (2021) The missing links of sustainable supply chain management and green radical product innovation between sustainable entrepreneurship orientation and sustainability performance. *Journal of Engineering, Design and Technology* . DOI: https://doi.org/10.1108/JEDT-05-2021-0267.

8 Delivering the European Green Deal https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en#transforming-our-economy-and-societies.

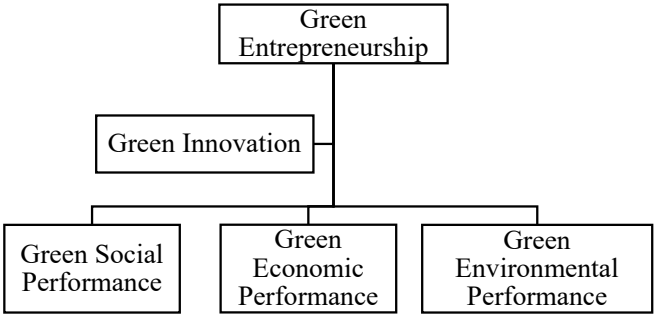
9 O'Neill, K., & Gibbs, D. (2016) Rethinking green entrepreneurship – Fluid narratives of the green economy. Environment and Planning A: Economy and Space, 48(9), 1727–1749. https://doi-org.db.rsu.lv/10.1177/0308518X16650453.

10 Buch-Hansen, H., & Carstensen, M. B. (2021) Paradigms and the political economy of ecopolitical projects: Green growth and degrowth compared. *Competition & Change*, *25*(3–4), 308–327. https://doi-org.db.rsu.lv/10.1177/1024529420987528.

The concept of 'green innovation was first proposed by Fussler and James already in 1996[11], to denote improvements and innovations in product processes that enhance the environmental performance of the firms. In addition to this, Borghesi et al. (2015)[12] refer to green innovation as processes of the use of innovative resources that may reduce the cost of production and improve a company's performance. In studies that are relevant to green innovations (Ratten, Ramirez-Pasillas, Lundberg, 2019),[13] importance is attached to the economic, environmental, and social performance of a company, which in turn could enhance the strength and competitiveness of the organizations. Entrepreneurship has an important role in delivering more radical green innovations that challenge existing firms and business models.

Green entrepreneurship is a system that reflects a company's strategic actions to accelerate green innovation and improve sustainable business performance (environmental, economic, and social). Green entrepreneurship leads to green innovation, which in turn gives rise to three variables, which include 'green social performance', 'green economic performance' and 'green environmental performance', as presented in the scheme below:

Scheme 1. A System of Green Entrepreneurship



11 Driving Eco-innovation:A Breakthrough Discipline for Innovation and Sustainability. Fussler, C., James, P., Pitman Publishing, 1999, p. 364.

12 Linking emission trading to environmental innovation: Evidence from the Italian manufacturing industry. Borgesi, S., Cainelli, G., Mazzanti, M., Elsevier, *Research Policy*, Volume 44, Issue 3, April 2015, pp. 669-683.

13 Athanasios Hadjimanolis. Drivers and Barriers in SMES in the Context of Small Countries in Managing Sustainable Innovation.Routledge,2020, pp. 60-67.

A policy needs to create the room for such new firms by enabling their entry, exit and growth, ensuring fair competition and improving access to finance, which remains a major constraint for the entry and growth of new businesses and firms. In addition, there is a strong need to facilitate transition to green growth in general and in business in particular. This aims to alleviate problems in adopting green innovations, due to weak innovation capabilities. The policy can help to enable businesses to participate in knowledge networks, strengthen the skills that can lead to innovation, and reduce the regulatory burden on firms.

1.2. Policy responses and implications: EU and Latvia

Currently the European economy and politics, and European integration in general, are confronting important challenges. The EU is facing both a major increase in energy prices, seriously impacting on its the economy as well as an immigration flow due inter alia to war in Ukraine. The EC proposes transformation of the EU economy and society and education to meet climate ambitions and new geopolitical and economic challenges.

As part of this, the EU is encouraging the education and training sector to take action to contribute to the green transition and to strengthen the sustainability competences of all learners.[14] However, lack of high skilled professionals is recognized as an important constraint on the way to dynamic economic development in the EU and is one of the main concerns for politicians and academics.

14 Green Education Initiatives. European Education Area. European Commission. https://education.ec.europa.eu/focus-topics/green-education/about.

Box 1: European Commission' vision for a European Educational Area (EEA)

EEA is guided by several dimensions[15]:

- improvement of basic skills (digital competences, and transversal skills - entrepreneurship, creativity and civic engagement);
- facilitation of mobility for learners and educators and international cooperation between education institutions;
- promotion of language learning, multilingualism and support the discovery and management of cultural diversity;
- enriching education with a European perspective encouraging understanding of and critical thinking about what Europe means in regard to citizens' daily lives;
- ensure that education and training institutions are safe, inclusive, and disinformation-free.

One of the guided EC's visions for the EEA is Higher education[16];

- support closer and deeper cooperation between higher education institutions, in particular international higher education alliances;
- co-create, together with Member States and stakeholders, a transformation agenda for higher education institutions
- develop a European approach to micro-credentials to help widen learning opportunities and strengthen the role of higher education and vocational education and training institutions in lifelong learning;
- promote focus on specialised education programmes on advanced digital skills related to cutting-edge technologies, such as artificial intelligence and high-performance computing.

15 Achieving a European educational area by 2025 and resetting education and training for the digital age. *Press release. 30 September 2020*, Brussels https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1743.

16 **A European Education Area by 2025.** https://eur-lex.europa.eu/EN/legal-content/summary/a-european-education-area-by-2025.html.

Latvia is on a good pathway towards reaching many of the Sustainable Development Goals (SDGs)[17]. According to the OECD Report[18], Latvia has managed to decouple several environmental pressures from its sustained economic growth, although challenges remain. It has significant opportunities for accelerating the transition towards a low-carbon, greener and more inclusive economy, especially by investing in energy efficiency, renewables, sustainable forestry and sound waste and material management. To seize these opportunities, it should make better use of economic instruments, remove potentially perverse incentives, and improve the quality of its environment-related infrastructure and services.

Latvia has a well-developed and comprehensive framework for sustainable development. It is defined by law and adopts the principle of vertical (hierarchical) and horizontal co-ordination of planning documents.

The Sustainable Development Strategy of Latvia until 2030 (Latvia 2030) includes long-term priorities, goals, and action lines, and is broadly consistent with the SDGs. It is based on a capital approach to sustainable development, which primarily focuses on wealth creation within the planet's ecological limits, with an emphasis on the correlation between environmental and economic systems. Latvia 2030 has a higher political standing than the previous sustainable development strategy. It is the result of a multi-stakeholder participatory process and was adopted by the Saeima (Parliament) in 2010. The broad public participation helped the strategy gain the legitimacy of a social contract and the broad support needed for its implementation. All SDGs are being integrated into the planning system and Latvia is making progress towards achieving them. However, the country needs to harness economic, environmental, and social opportunities of moving towards a circular economy, enhancing innovation and eco-efficiency, reducing inequality and improving access to education and health.[19]

Several areas for action have been identified:

- increasing productivity of the economy, including through more efficient use of resources and larger investment in research and innovation
- improving labour market performance
- improving the health care and social welfare systems

17 OECD (2019), *Measuring Distance to the SDG Targets 2019: An Assessment of Where OECD Countries Stand*, OECD Publishing, Paris. https://doi.org/10.1787/a8caf3fa-en.

18 OECD (2019), *Economic Surveys: Latvia 2019*, OECD Publishing, Paris, https://doi.org/10.1787/f8c2f493-en.

19 Latvia. Cross-Sectoral Coordination Centre (2018), *Implementation of the Sustainable Development Goals*. https://sustainabledevelopment.un.org/memberstates/latvia.

– improving service provision to low-density areas, including road infrastructure, public transport and housing
– adapting to climate change, reducing GHG (greenhouse gases) emissions and promoting wider use of renewable energy sources.

Sustaining growth in the long term will also require more investment in education[20] and innovation to further diversify exports towards products and services with higher technological content and value added.

II. Green entrepreneurial approach in higher education: a key to sustainability mindset

The European Skills Agenda[21] is a five-year plan to help individuals and businesses develop more and better skills and to put them to use, by strengthening sustainable competitiveness, as set out in the EGD ensuring social fairness, putting into practice the first principle of the European Pillar of Social Rights: access to education, training, and lifelong learning for everybody. In addition, the EU is building resilience to react to crises, based on the lessons learnt during the COVID-19 pandemic. [22]

Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the EGD will transform the EU into a modern, resource-efficient, and competitive economy, ensuring: no net emissions of greenhouse gases by 2050, economic growth decoupled from resource use, and no person or place left behind. The European Green Deal also offers a lifeline out of the COVID-19 pandemic. One third of the 1.8 trillion-euro investments from the NextGenerationEU Recovery Plan, and the EU's seven-year budget will finance the EGD.[23] In this context, it is important to stress that higher education and research are facing new challenges and must respond to the new processes that strengthen the mutual ties between international communities. The interrelation and interaction of political, economic, social and other dimensions lead to

20 OECD (2019), *OECD Economic Surveys: Latvia 2019*, OECD Publishing, Paris, https://doi.org/10.1787/f8c2f493-en.

21 Commission Staff Working Document, Accompanying the document Proposal for a Council Recommendation on Key Competences for LifeLong Learning. Brussels, 18 January 2018.

22 European Commission. Employment, Social Affairs & Inclusion. European Skills Agenda. https://ec.europa.eu/social/main.jsp?catId=1501.

23 European Commission. *A European Green Deal*. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal.

the interdependence of studies and a demand for integrated comparative educational settings that offer a green entrepreneurial approach to the development of generic and specific knowledge, skills and competences.

Different factors are impacting on the educational and research environment. These encompass changes in the international division of "intellectual" labour and the corresponding financial resources, as well as a number of economic growth factors, such as a period of the current economic, energy and social turmoil and its consequences on education and research. These challenges are reshaping global markets, and impacting on education systems, research, innovation, and knowledge development. Such transformation processes lead to intriguing research questions, such as: how are universities adjusting to these new market demands and, specifically, how are universities creating skills ecosystems? What are the implications of the green entrepreneurship and innovation system and the introduction of this system in the field of higher education? In recent years, a growing body of knowledge has been developed towards higher education to implement a sustainability curriculum in higher education and outreach activities, which include published studies (Weiss, Barth, 2019), (Menon, Suresh, 2020) in the Journal of Sustainability in Higher Education.[24]

Universities worldwide are in the midst of a dramatic transformation of their administrative and scholarly goals. Such reforms are driven by a sense of global competition among higher education institutions, now requiring universities to set strategic plans for growth and excellence.

2.1. The need for updates in education

According to the research produced by the World Economic Forum (WEF), today's education system does not meet the needs of young people. "I feel like I am learning all the theory, but not the practical skills I will need later in the field, which is a huge miss" - is a thought shared by a participant in one of the interviews conducted by the WEF researchers.[25] Young people in

24 Weiss. M., M. Barth. M. (2019) Global research landscape of sustainability curricula implementation in higher education, *International Journal of Sustainability in Higher education*, Vol..20, No. 4, pp. 570-589.; Menon. S., Suresh., M. (2020) Synergising education, research, campus operations, and community engagements towards sustainability in higher education: A literature review. *Journal of Sustainability in Higher education*, Vol. 21, No.5, pp. 1015-1051.

25 We asked young people about work and skills. World Economic Forum (WEF). https://www.weforum.org/agenda/2021/07/we-asked-young-people-about-work-and-skills/?utm_sourc

general need to become more adept at seeing opportunities where others see problems, more willing to take risks, and more willing to accept failure.

Governments, private companies, universities, incubators, and accelerators are all increasingly looking to cultivate the next generation of entrepreneurs. Many educational programs are taking an increasingly innovative approach to developing richer "human capital" and fostering greater entrepreneurship in general and green entrepreneurship in particular.

Technological changes and demographic shifts require reskilling to meet labour market demands. However, lifelong learning opportunities, for example, modular short-cycle courses, experience on the job, and exposure to new projects are necessary to help more people gain skills that match labour market demand. Businesses need to recognise and invest in their "human capital" as an asset, rather than see it as a liability.[26]

The programs acquaint the prospective entrepreneurs with the broader mechanisms at play at both a national and regional level that can be leveraged to support entrepreneurship and growth - and introduce these young people to tools and resources necessary to increase the scale of their ventures. Specialized education should focus in particular on skills that are in demand in the real world and address the disconnect between employer needs and available talent pools. "The business of businesses is climate-change adaptation"[27]

More dialogue and cooperation among companies, regulators, investors, consumers, and workers will be necessary to earn and sustain public trust.

2.2. Promotion of innovation in the Green Economy in HE programmes in the EU

According to the Curriculum "Preparation and management of SMEs for work in the Green Economy" by the Satakunta University of Applied Sciences (SAMK),[28] concrete goals of education towards green economy are the following:

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e=sfmc&utm_medium=email&utm_campaign=2752036_Agenda_weekly-6August2021-20210804_095303&utm_term=&emailType=Agenda%20Weekly.

26 Ibid.

27 The Economist. 11 January 2022. https://www.economist.com/special-report/2022/11/01/the-business-of-businesses-is-climate-change-adaptation.

28 Preparation and management of SMEs for work in the Green Economy. Satakunta University of Applied Sciences (SAMK), Dr. Kari Lilja, Dr. Sirpa Sandelin and Sanna Lindgren, 2020 European Commission. Erasmus+. Hanse-Parlament projects https://www.hanse-parlament.eu/projects/.

– "To give participants an understanding of environmental issues that will affect our societies and businesses in the near future.
– To give participants an understanding of sustainability and sustainable development and how these concepts can help to tackle the challenges caused by changing climate and other environmental and societal threats.
– To give participants a common information concerning the European and national policies concerning the environmental issues, sustainability, and green economy.
– To give participants a basic knowledge of green economy and its benefits and challenges for an enterprise and business.
– To help participants innovate new ideas how they and their companies will find the best ways to respond the challenges".[29]

Educational programmes that support entrepreneurships and innovation in the green economy have been developed in many EU countries, for example, in Germany, Finland, Belgium and France. These experiences are given in Boxes 2-3.

29 Ibid.

Box 2: Dual educational programmes in Finland and Germany [30]
Similar to the training-integrated programmes, the practice-integrated dual programmes include a mix of practical elements in a company and academic training.
The big difference is, however, that the practical elements do not encompass an officially recognized vocational training. Therefore, graduates of practice-integrated dual programs graduate with an academic degree, typically a bachelor's or in some cases a master's degree, some practical work experience under their belt but not official vocational training certificate in a recognized profession. In 2019, nearly 50% of study programs were offered in this form.
Students of this model are either employed as interns or as regular employees but not as apprenticeship trainees. Most often, students of this model cooperate with only one company throughout this time, however, there are also practice-integrated dual study models that allow you to change companies each semester and intern in various companies. In this latter case, it may be that you only receive a salary during the months that you work.
Students typically start this program type after high school graduation or after graduating from a bachelor program. Some students of this type also have started a career before deciding to get additional qualifications under this study model.

The practical and theoretical curricula are coordinated in practice-integrated academic programmes. Such programmes are popular with students due to combination of practical experience and often students receive salaries throughout their studies. These aspects are now being emphasized in entrepreneurial education programs, for example in educational programmes in Belgium and France are sets out the basic characteristics of the model in the Box 3.

30 Ibid.

BOX 3: Entrepreneurship and innovation
Vlerick Business School practical training*[31] *on particular themes below.
Start-ups; Scale -ups; SME; Family business; Corporate innovators.
Short and focused programmes address today's most relevant business issues in a short but intense programme's format. The number of programme's days varies from 2 to 6 days, dependent on the programme.
Growth through Innovation
Ensure your competitive advantage by formulating your innovation strategy.
Product management
Launch new products and services successfully.
New Business Development
Realise sustainable growth by exploring and implementing new business opportunities.
Project Management
In line with your strategy.
Educational programmes in France, Lyon
Entrepreneurship & Innovation Management[32]/Executive master's in digital Innovation and Entrepreneurial Leadership[33]
The programmes are focused on management and entrepreneurship
Management combines both innovative and entrepreneurial dimensions, allowing you to carry out a wide variety of projects and acquire a more global perspective.
Students will be able to specialise in entrepreneurship and innovation and technology to acquire more knowledge about family business, social entrepreneurship, strategic management of technology, etc.

This is a new trend in the transformation of our societies in which universities are involved; this is also the situation witnessed in Latvia.

31 Public Utility Foundation, Gent, Belgium https://www.vlerick.com/en/contact; Entrepreneurship and innovation- https://www.vlerick.com/en/management-expertise/entrepreneurship-and-innovation-overview.

32 Entrepreneurship &Innovation Management. Business School, Lyon, France https://masters.em-lyon.com/en/Specialized-Program-Entrepreneurship-Innovation-Management.

33 Executive master's in digital Innovation and Entrepreneurial Leadership. Germany, https://www.sayinstitute.eu/programme/master-digital-innovation-entrepreneurial-leadership-emdiel-mba/.

III. Latvia: maturity in relation to Green Economy and Innovation in HE programmes in Latvia

3.1. Economic and demographic context

Latvia has a small open economy, with a small industrial base, a large agriculture and forestry sector. Until the outbreak of Covid-19 pandemic, Latvia's economic growth remained stable, exceeding the EU average. From 2011-2019, GDP on average increased by 3.3% annually. In 2019, economic growth moderated. GDP increased by 2%. The slight economic slowdown was driven by both internal factors (investments from EU funds have peaked, developments in the financial sector, etc.) and external factors (review of global trade tensions, Brexit, slower growth in other EU countries). Moreover, in 2020, the increase in unemployment and the fall in income caused by the Covid-19 crisis have significantly reduced household consumption. In 2020, private consumption was 10% lower than in 2019. The government's support measures to mitigate the negative effects of Covid-19, which have been largely financed at the expense of increasing the general government deficit, have maintained positive growth in government consumption. In previous years, the increase in investment was largely due to the acquisition of EU funds. In 2020, GDP decreased by 3.6%, compared to 2019. However, following the improvement of the epidemiological situation, which was facilitated by vaccination, economic activity has gradually increased and in 2021 according to the Central Statistical Bureau (CSB) GDP as compared to 2020, grew to 4.8%.[34] Nevertheless, the uncertainty remains elevated according to the European Parliamentary Research Service (EPRS).[35] The OECD noted that the size of the Latvian population is declining fast due to ageing and emigration, and that productivity growth declined following the 2008 global crisis. The OECD stresses that policies to enhance digital transformation as well as green and digital transition are of prime importance to address the above-mentioned issues.[36] Furthermore, experts estimate that rapidly increased prices of natural gas and other energy

34 Central Statistical Bureau of Latvia, 2022. https://stat.gov.lv/en/statistics-themes/economy/gross-domestic-product-quarterly-data/press-releases/8220-gross-domestic.

35 Jerome Saulnier. Latvia's National Recovery and Resilience Plan (2022). European Parliament https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/698887/EPRS_BRI(2022)698887_EN.pdf.

36 Going For Growth' Report on Latvia. (2021) OECD. https://www.oecd.org/economy/growth/Latvia-country-note-going-for-growth-2021.pdf.

resources in 2022[37] could continue to rise until the 1st quarter of 2023, so Latvian residents will have to reckon with unprecedented, record-high energy bills in the winter 2022 period. According to the data of the Central Statistical Bureau of Latvia, already in the first half of 2022, electricity prices increased almost twice compared to the price of electricity per kilowatt hour in the first half of 2021 and the price of natural gas for consumers increased almost 2.5 times.

The competitive advantages of the Latvian economy mainly rely on technological factors, improvements in production efficiency and innovations; however, to a lesser extent on low labour and resource prices. Reframing green investments should be complemented by measures that improve skills and facilitate the reallocation of labour and capital.

Considering the decline in labour demand, which was affected by the overall downturn in economic activity due to the Covid-19 crisis, in 2020, the number of employees decreased by approximately 17 thousand or 1.9%, compared to 2019, thus representing the largest decrease in the number of employees since 2010.

Along with declining employment, unemployment has also risen. Unemployment rates remained almost 1/3 higher than before the Covid-19 crisis. Overall, in 2020, the average unemployment rate increased to 8.1%, which is 1.8 percentage points higher than in 2019.[38]

Furthermore, the level of economic activity in Latvia still varies greatly from region to region, with most jobs concentrated in Riga and the surrounding areas, while the number of jobs in other regions is much lower. At the end of 2022, the registered unemployment rate was the lowest in Riga (4.6%) and the Riga region (4.7%), while the highest rate was recorded in the Latgale region (14.8%).

The labour market is also affected by the negative demographic situation in the country for a long time, leaving an impact on both unemployment and the dynamics of the number of employees. Figures from the Central Statistical Bureau of Latvia show at the beginning of 2021 the population of Latvia amounted to 1 million 893 thousand people, which is 14.5 thousand people fewer than in 2020.[39] In 2020, the population decreased more rapidly - by 0.76% compared to 0.64% 2019, including a decrease of 0.59% due to negative natural growth and 0.17% due to migration. In 2020

37 Central Statistical Bureau of Latvia, 2022. https://data.stat.gov.lv/pxweb/lv/OSP_PUB/START__NOZ__EN/.

38 Ministry of Economy, The Republic of Latvia, 2020.

39 Central Statistical Bureau of Latvia https://stat.gov.lv/en/statistics-themes/population/population-number/press-releases/6935-number-population-latvia-2020.

the lowest birth rate in the last hundred years was registered - 17.6 thousand children were born in Latvia - some 1 234 (or 6.6 %) less than in 2019, which is the lowest indicator over the last hundred years. The demographic decline not only affects the student population, but also the labour market. Further, working age people will be needed to cope with an increasing old-age dependency problem, as well as structural and technological changes in economies and businesses in the 21st century. In 2020, population in private households aged 15-74 declined by 9.5 thousand, compared to 2019. It should be noted that high long-term unemployment can lead to an increase in structural unemployment, i.e., the longer these people remain unemployed, the greater the risk of them losing their previous skills.[40]

The demographic situation in Latvia is characterized by a negative natural rate of increase and by ageing. Depopulation started in the early nineties and still continues. In particular, the size of younger age cohorts has decreased. This is connected to the fact that at the beginning of the nineties of the 20th century, the birth rate fell sharply. Twenty years later the smaller youth population is about to enter the higher education system and the labour market. Demographic processes are inert compared to financial markets and the economy, so there are no quick solutions in demography.

It becomes increasingly difficult for unemployed to adapt to new labour market needs. Risks that some of the unemployed may have difficulty finding a job matching their skills in the future remain elevated.

The higher education system has to adjust to two forthcoming changes arising from demographic changes – a decrease in total enrolment volume and a change in the age structure.

In its current form the present size of higher education system is not sustainable. Clearly, there are no solutions to increase the size of cohorts as a way to rescue the higher education system, at least not in the near future.

According to experts, the supply of adequately skilled workers could significantly decrease in the future, and the importance of practice-integrated education in higher educational institutions will continue to increase.

The studies confirm that if the current structure of higher education is maintained, the workforce shortage in the higher education group will mostly affect the pool of professionals educated in engineering, natural sciences and ICT. By 2027, the shortage of adequately skilled workers may

40 Ministry of Economy of the Republic of Latvia, 2020.

exceed 14 000, mostly in areas such as architecture and civil engineering, computer sciences, physical and engineering sciences.[41]

Here, opening up new types and models in education could be part of the solution, for example to consider a trend of vocational education and professional educational programmes at HE institutions in the country.

3.2. Practice-integrated academic programmes in green entrepreneurship and innovation

Institutional Framework. The education system is administered at three levels - national, institutional and municipal.

National. The Parliament (Saeima), the Cabinet of Ministers and the Ministry of Education and Science are the main decision-making bodies at national level.

Institutional. The Ministry of Education and Science is the education policy development and implementation institution that oversees the national network of education institutions, sets educational standards, and determines teacher training content and procedures.

Operating at the institutional level are:

– the National Centre for Education- a public administration institution directly subordinated to the Minister of Education and Science;
– the Academic information centre (AIC) a non-profit institution, foundation established in 1994 by the Ministry of Education and Science and University of Latvia, Institute of Mathematics and Computer Science.

AIC implements the following functions:

– Latvian representative to the European diploma recognition networks ENIC/NARIC[42];
– Information institution on recognition of professional qualifications in regulated professions;
– Latvian coordination point for referencing national qualifications framework to the European Qualification Framework;
– Quality Agency for Higher Education.

41 The Ministry of Economy of the Republic of Latvia. Informative Report "On medium-and long-term labour market forecast". 2020 https://www.em.gov.lv/sites/em/files/labour-market-forecasts-2020-full1_0.pdf.

42 The ENIC-NARIC Networks are the result of an ongoing collaboration between the national information centres on academic recognition of qualifications of in total 55 countries. The national information centres are operating under the principles of the Lisbon Recognition Convention (1997).

3.3. Practice-integrated programmes and their implementation

According to the Ministry of Education and Science of the Republic of Latvia, there are two groups of programmes that can be distinguished: academic programmes and professional programmes or practice-integrated programmes.[43]

Academic higher education programmes are based upon fundamental and/or applied science; they usually comprise a thesis at the end of each stage and lead to a bachelor's degree or master's degree.

The Law on Higher Education Institutions and the Law on Vocational Education and Training (VET) stipulate two cycles of professional higher education – the first cycle professional higher education, also known as college education, takes 2-3 years, leading to the professional qualification Level 4 and second cycle professional higher education leading to the qualification level 5 (2-3 years following a first cycle programme, or not less than 4 years following upper secondary education).[44] The first cycle professional higher education programmes train students to gain skills and enter complicated professions (e.g. bank staff, business specialists, IT specialists, legal assistants, engineering technicians). The qualifications of the graduates correspond to professional qualification Level 4 that allows them to perform complex tasks under changing conditions, to take responsibility for the allocation of resources, to organize and manage the work of other specialists and/or workers. It also allows graduates to compete in the labour market or to continue their education in a related programme for obtaining a higher professional qualification. These programmes are considered to be "non-university" higher education programmes.

The qualifications obtained in the second cycle professional higher education programmes correspond to professional qualification level 5. (Level 5 – the highest qualification of a specialist in a given occupation). Level 5 provides the capacity for independent analysis, to take decisions, to design and/or plan, to organize, manage and control and/or to carry out scientific research activities in a given branch. Usually, a professional bachelor's degree in a certain sector of the national economy is obtained simultaneously with

43 Ministry of Education and Science of the Republic of Latvia https://www.izm.gov.lv/en/education-system-latvia.

44 Vocational Education Law. The Parliament of the Republic of Latvia (*Saeima*) on 10 June 1999; Latvijas Vēstniesis, 213/215, *30.06.1999. amended on 06.01.2017.* https://likumi.lv/ta/en/en/id/20244.
ILO. Latvia. https://www.ilo.org/dyn/natlex/natlex4.detail?p_lang=&p_isn=56400.

the qualification. These programmes are considered to be "university-type" higher education programmes.

Upon completion of a programme of professional higher education, students are awarded a professional qualification and a professional bachelor's degree that can be followed by further 1-2 years of professional master's studies. The master's degree of higher professional education is awarded if the total duration of studies is at least five years. There is growing interest in programmes that aim to combine vocational and academic learning in so-called 'dual study programmes', taking a complementary perspective of VET and higher education. Vocational education is provided at three levels:[45]

– basic education (integrated primary and lower secondary);
– secondary education (upper secondary);
– higher education.

Vocational education combines education and practical training (50-65% of curricula depending on the type of programme) at school and enterprises. Vocational education at secondary level can be implemented also as an apprenticeship type scheme (nationally called "work-based learning"[46], with flexible curricula taking place alternately at school and in enterprise.[47] Vocational education institutions, depending on the founder, can be public (state, local government) and private. Institutions that provide vocational secondary education programmes and additionally act as regional methodological and continuing education centres and carry out validation of non-formal and informal learning may obtain a status of vocational education competence centre according to criteria established by the Cabinet of Ministers.

Professional higher education. Higher education programmes can be academic (lead to a degree) or professional (lead to a degree and/or professional qualification). There are Bachelor's, Master's and Doctor's degrees in both academic and professional higher education. More than two thirds of all higher education students study in professional study programmes. Professional higher education programmes allow continuous progression

45 Ministry of Education and Science in Latvia https://www.izm.gov.lv/en/education-system-latvia.

46 Law on Higher Education Institutions. Article 56. Adopted: 02.11.1995. https://likumi.lv/ta/en/en/id/37967.

47 Cabinet Regulation no. 484. Procedures by which Work-based Learning is Organized and Implemeted. Latvia. Adopted: 15.07.2016. https://likumi.lv/ta/en/en/id/283680.

from EQF levels 5 to 8.[48]. Professional education programs are developed by educational institutes in coordination with its founder. To provide development of curriculum in professional basic education, professional secondary education, professional training, and professional development education in accordance with national standards, National Centre for Education is organizing development of samples for professional education programs and advising development of programs.

Professional standards. According to regulations of the Cabinet of Ministers, The Ministry of Education and Science and the National Centre for Education in co-operation with the Tripartite Cooperation sub-council of Vocational Education and Employment perform the following tasks:

– organise the development and expert-examination of draft professional standards and vocational standards, inviting representatives of sectoral ministries and professional organisations; and
– provide organisational and methodological support for the development of the draft professional standards and vocational standards.[49]

In parallel to the Bologna cycle structure, a division of professional higher education programmes is implemented at two levels:

First level professional higher education programmes (college or short cycle studies, 2-3 years) leading to a Diploma of first level professional higher education and professional qualification (EQF level 5). Applicants with secondary education are admitted. These programmes are mainly focused on acquiring professional skills for labour market, but graduates can continue their studies in second level professional higher education programmes.

3.4. Practice – integrated programme: the case of business education at Riga Stradins University (RSU)

Development of new learning and teaching environment is an important current trend at the RSU. It is important due to changes in the economic environment in the country, tendencies in the demographic situation and labour market. Furthermore, requirements for development of new knowledge and skills demand new and modern programmes. Development of entrepreneurial orientation is fundamental to a green and sustainable en-

48 National Centre for Education. The Republic of Latvia https://www.visc.gov.lv/en/professional-standards-and-programs.

49 Ibid.

trepreneurial orientation, which are to be reflected in practice-orientated business education.

The Entrepreneurship and innovation in Green Economy orientated educational programme could serve as an example of new and relevant tendences in businesses and economy, as well as the latest trends in higher education, and labour market education programmes development. Such types of educational programmes represent a framework for training new skills demanded by the labour market and promote basic and specialised competencies that will allow graduates to be actively involved in the planning and management of modern international business and green entrepreneurship and innovation. The main aim, objectives and innovative approaches in organising studies are given in the Box 4.

BOX 4: The Entrepreneurship and innovation in Green Economy-EDUCATIONAL ProgramMe (EIGE)[50]

Aims and objectives The programme's focus is on educating new specialists with knowledge about green economy and innovation with silks relevant to management of business entities with focus on new tendences in the green economy and innovation context. The aim of the programme is to prepare highly qualified and creative specialists in international business and EIGE as well as in management.

Innovative approaches. Special attention is given to the provision of innovative approaches to the implementation of studies in an up-to-date learning environment, which includes:

- regular discussion of the design and study course descriptions with lecturers and external experts from both academic and industrial environment in Latvia and abroad;
- identification and updating of teaching material and technical support required for study courses, including literature and other modern-day materials (computer programs and applications, business games, video materials, interactive online tools);
- identification and inclusion of knowledge transfer and co-creation methods in the implementation of EIGE study courses;

50 Three-level Centres of Professional Excellence. Qualification, entrepreneurship and innovation in the Green Economy. European Commission Erasmus + https://www.rsu.lv/en/project/3loe-three-level-centers-professional-excellence-qualification-entrepreneurship-and.

- identification of interdisciplinary issues, creation of thematically relevant content, successive integration into study courses;
- organization of lecturers' experience exchange, active and wide use of e-learning and interactive online environment tools, attraction of guest lecturers, study visits to companies.

Practice-oriented cooperation with employers in the basic study process (in addition to guest lectures), solving business problems in the study process will also be organized, for example, in the development of yearly provided practice reports final theses, which allows bringing studies closer to practical business.

Green Entrepreneurship competences. The programme foresees a study process that pays attention to development of general critical competencies - communication and digital skills, teamwork, entrepreneurship, leadership development, enriched by process management and business model specifics in, for example, development of entrepreneurship in healthcare. In turn, the programme will ensure high quality of study process and study results. Furthermore, as the programme is aimed to integrate practice, it focuses on educating highly qualified specialists in the field of business management for Latvia, the EU and the entire world community and its management processes. Achieving this goal is ensured by providing students with the opportunity to receive theoretical and practical knowledge, skills, and competencies relevant to business and interdisciplinary interaction, using the results of fundamental and practical research in several disciplines, qualified lecturers from academia and business, modern study content and format.

The focus on the Green concept in entrepreneurship and innovation meets the needs and trends of society and economic development which is clearly justified by a number of labour market research[51] on occupations and skills needed[52] in the planning of the new green and innovative business development.[53] The objectives of the programme correspond to the needs of economic development and the integrating components of the Latvian Smart Specialization Strategy (RIS3) – including building human capital and public innovation capacity, promoting gradual modernization

51 Martinez-Fernandes. Cr., Hinojosa. C. Miranda,.G. (2010) Green jobs and skills: the local labour market implications of addressing climate change. OECD. pp.18-25.

52 Lamio.E., Sebillo.A., (2022). Profiling the new young social entrepreneur. Diesis Network, Brussels. Belgium. https://www.diesis.coop/wp-content/uploads/2022/06/COMUN-254.pdf.

53 Anticipating skills needs for green jobs (2015) ILO, pp. 34-47.

of the research and education sector, and developing an innovation system to drive public resources for innovation in general and in particular, to provide students with knowledge and ensure the development of practical skills and competencies in the understanding, analysis and management of economic and business processes, implementing a student-centred approach in an interesting and practical study process; to balance the knowledge of theory and modern development tendencies during studies with an analysis and solution of situations based on practical resolution of business problems and those in the work environment. Additionally, to ensure a high-quality, high-value and innovative study process, using examples of best practices in higher education in an international context, including the study process infrastructure (e-environment, library, multimedia equipment, etc.) and process organization (team teaching, cooperation in the labour market, simulation, video collections, semester projects, etc), to implement consciously modern and non-traditional methods of knowledge transfer and co-creation, as well as skills development, promoting students' interest in the study program topics and motivation to use in the international business environment. It is essential to maintain and develop extracurricular activities and cooperation of the study programme in the business, public administration, and academic context in Latvia and in the international environment (conferences, summer schools, visits, etc.) and to ensure continuous quality monitoring and updating of the study program in cooperation with entrepreneurs and representatives of professional organizations in the business sector.

The academic staff and practice-oriented trainers have to show the best example to students in the aspect of professional ethics and professional development (participation in the development of the field, formation of opinion leadership, etc.), promoting a culture of active personal and professional development and participation of students.

The main outcomes are in the education of young specialists and entrepreneurs with expert knowledge in new trends in the green and innovation in business development.

Conclusion

Green entrepreneurship is a system that reflects company's strategic actions to accelerate green innovation and improve sustainable business performances (environmental, economic, and social). Green entrepreneurship leads to green innovation, which in turn gives rise to three variables, namely Green

Social Performance, Green Economic Performance and Green Environmental Performance.

Entrepreneurship has an important role in delivering more radical green innovations that challenge existing firms and business models.

A policy needs to create the room for such new firms by enabling their entry, exit and growth, ensuring fair competition and improving access to finance, which remains a major constraint for the entry and growth of new businesses and firms. In addition, there is a strong need to facilitate transition to green growth in general and in businesses in particular. This trend experiences problems in adopting green innovations, as they often have weak innovation capabilities. The policy can enable enterprises to participate in knowledge networks, strengthen the skills that can lead to innovation, and reduce the regulatory burden on firms.

The EC proposes transformation of EU economy and society to meet climate ambitions by suggesting a set of proposals to make synergy in the EU's climate, innovation and related education policies.

The authors have discussed the case of Latvia in relation to transformation of economy and society in line with the EU policies. Attention was given to challenges facing education and research in times of urgent need to increase green innovation and apply green entrepreneurship trends in educational programmes to adjust knowledge, skills, and abilities of graduates to labour market requirements, which in turn will have a positive impact on employability in the country.

The above-indicated aspects are subject to further strong educational research and the implementation of new educational programmes with practice-integrated components. The comparative approach to absorb international experience is badly needed to improve educational programmes at HE institutions. The results could show to the policymakers what types of changes in employability are expected by the labour market.

Overall, in times of economic hardships it is important that universities, governments, and business collaborate in educational research, innovation, and development. With no clear end in sight to the current economic situation in Europe and other parts of the world, there is more need than ever for strategic partnerships and cooperation between all partners interested in green innovation, improvements in business environment and labour market.

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