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Pregledni rad / Review article

Article info:

Received: 10.2.2026.
 Accepted: 27.03.2026.
 UDC: 37.014.5:334.722
 DOI: 10.38190/ope.16.1.1

VOCATIONAL AND GENERAL EDUCATION MODELS IN EUROPE: COMPARATIVE OUTCOMES AND NORMATIVE IMPLICATIONS FOR EDUCATION FOR ENTREPRENEURSHIP

Abstract: *This paper compares different models of vocational education and training (VET; hereafter VET) and general/university education in Europe, with a focus on their labour-market outcomes and implications for education for entrepreneurship. We analyse dual systems in Germany, Austria and Switzerland, mixed models in the Netherlands and Nordic countries, and the specific position of Croatia, which has one of the highest shares of students in VET programmes in the European Union and one of the lowest early school-leaving rates. Drawing on comparative empirical studies, we show that VET programmes are highly effective in ensuring a fast and smooth school-to-work transition and lower youth unemployment, while general and university education is associated with higher earnings and greater adaptability later in the life-course. The paper integrates these findings with Croatian strategic and legal documents, including the Strategy for Education, Science and Technology, the National Plan for the Development of the Education System and the Croatian Qualifications Framework (CROQF; hereafter CROQF), and offers a critical assessment of the current tendency to promote dual and professional study programmes as functionally equivalent to university programmes. We argue that for a small open economy, sustainable development of education for entrepreneurship requires a balanced architecture: strong VET for short-term operational needs and equally strong university and interdisciplinary programmes for long-term innovation, strategic decision-making and systemic change. The paper concludes with concrete normative recommendations for Croatian policymakers, higher-education institutions and stakeholders in entrepreneurship education.*

Keywords: *vocational education and training; general education; dual system; entrepreneurship education; labour-market outcomes; Croatian Qualifications Framework*

JEL classification: *I21; I25; J24*

1. Introduction

Education systems do not change societies overnight; they do so over generations. While fiscal or industrial policies can show effects within a political cycle, changes in education reshape the structure of skills and competencies over many years. This simple fact makes the design of education policy—particularly the balance between vocational education and training (VET) and general/university education—one of the most strategic choices a country can make. In the aftermath of the global financial crisis, many European Union (EU) and Organisation for Economic Co-operation and Development (OECD; hereafter OECD) countries turned to strengthening vocational

education and training (VET) as an instrument for reducing youth unemployment and improving school-to-work transitions. Dual systems, in which students split their time between school and the workplace, became a widely promoted “best practice”, particularly in the context of German-speaking countries. At the same time, accelerated digitalisation, automation and the green transition have fundamentally changed the structure of labour-market demand. Employers now require not only job-specific technical skills, but also transversal, higher-order competencies such as critical thinking, problem-solving, collaboration, digital literacy and the ability to deal with novelty and complexity. These competencies are essential not only for employees but also for

entrepreneurs and intrapreneurs who must continuously redesign business models and organisational processes (OECD, 2023). Croatia occupies a particular position in this landscape: it has a very high share of upper-secondary students in VET programmes (around 70 %) and the lowest early school-leaving rate in the EU, yet it faces persistent skills shortages, strong seasonal and migrant labour dependence, and frequent public claims about “too many graduates” in certain fields. In parallel, Croatian public discourse—partly under the influence of employers’ associations—tends to present dual and vocational pathways as inherently more “practical” and “labour-market relevant” than university education, including in fields directly relevant to entrepreneurship and enterprise development. This discourse often ignores both the international evidence on long-term outcomes and the different missions of vocational and university education. The purpose of this paper is threefold:

- to provide a theoretical framework for understanding the relationship between VET and general/university education over the working life-course;
- to compare key education models in several European countries and their labour-market outcomes, including those relevant for entrepreneurship and entrepreneurial careers; and
- to derive normative implications for Croatian education policy, particularly in the context of education for entrepreneurship and the role of dual and university studies.

2. Theoretical framework: specific versus general skills and life-course outcomes

The international literature on education and labour-market outcomes often distinguishes between **specific skills** and **general skills**. Vocational education and training (VET) primarily develops specific skills closely tied to particular occupations, sectors or technologies. By contrast, general secondary and university education tends to build general cognitive, analytical and methodological skills that are transferable across occupational domains (Hanushek, Schwerdt, Woessmann, & Zhang, 2017; Woessmann, 2017). From a life-course perspective, these two categories of skills are associated with different earnings profiles and employment dynamics. In the early career phase, VET graduates typically enjoy:

- faster and smoother transitions into their first job;
- lower initial unemployment risk; and

- sometimes slightly higher entry-level wages, especially in countries with strong dual systems (Golsteyn & Stenberg, 2017; Hoidn & Štastný, 2021).

However, empirical research increasingly shows that the picture reverses later in the working life. General and tertiary education is associated with:

- steeper wage growth;
- greater occupational mobility;
- better adaptability to technological and structural change; and
- higher cumulative lifetime earnings (Cörvers, Heijke, Kriechel, & Pfeifer, 2010; Korber & Oesch, 2019).

Woessmann (2017) summarises this as a **life-cycle trade-off**: vocational education offers a “fast start but lower long-term ceiling”, while general education offers a “slower start but higher long-term ceiling”. For entrepreneurship and entrepreneurial careers, this trade-off is particularly relevant. Entrepreneurs often start from specific sectoral skills, but successful growth and innovation depend on:

- the ability to reinterpret markets and technologies;
- strategic decision-making under uncertainty;
- understanding regulatory, financial and social contexts; and
- integrating multidisciplinary knowledge.

These are precisely the domains in which general and university education tends to provide an advantage. A sustainable architecture for education for entrepreneurship therefore cannot rely solely on VET, but must integrate both types of skills and encourage **hybrid profiles**.

3. Methodology

This paper employs a **qualitative comparative analysis** based on secondary sources. Four complementary methodological steps were used:

1. **Systematic literature review.** We reviewed empirical studies comparing vocational and general education outcomes, with a focus on employment probabilities, wage trajectories and adaptability across the life-course (e.g., Golsteyn & Stenberg, 2017; Hanushek et al., 2017; Korber & Oesch, 2019; Woessmann, 2017).
2. **Comparative policy analysis.** We examined institutional designs and policy frameworks in selected countries with strong dual systems (Germany, Austria, Switzerland) and mixed or



general-oriented systems (the Netherlands, Finland and other Nordic countries), using reports from Cedefop (European Centre for the Development of Vocational Training; hereafter Cedefop) and the OECD.

3. **Analysis of Croatian strategic and legal documents.** We analysed the Croatian Strategy for Education, Science and Technology, the National Plan for the Development of the Education System until 2027 (NPRSO), and the Act on the Croatian Qualifications Framework (CROQF Act), with a focus on how they define the roles of VET, dual education, professional and university studies.
4. **Normative analysis with author's critique.** Building on these sources, we formulated a normative assessment of the current direction of Croatian education policy, particularly the risk of functionally equating professional (vocationally oriented) studies with university studies through equal CROQF levels and European Credit Transfer and Accumulation System (ECTS; hereafter ECTS) credits, and its implications for education for entrepreneurship.

The aim is not to provide new econometric estimates, but to synthesise existing evidence into a coherent conceptual and policy narrative relevant for the E4E readership.

4. Comparative overview of education models

We analyse dual systems in Germany, Austria and Switzerland, mixed models in the Netherlands and Nordic countries, and the specific position of Croatia, which has one of the highest shares of students in VET programmes in the European Union and one of the lowest early school-leaving rates.

4.1. German-speaking dual systems

Germany is often seen as the archetype of a dual VET system. Students split their time between vocational schools and training firms, qualifications are regulated nationally, and chambers of commerce and crafts play a central role in examinations and quality assurance (Euler, 2013). Empirical research shows that German VET graduates experience relatively low youth unemployment and smooth transitions from training to employment, often staying with their training company (Burkert & Seibert, 2007; World Bank, 2013). Austria exhibits similar features: apprenticeship is a mainstream pathway and not a “residual option”,

with strong integration of employers and social partners (OECD, 2025). Switzerland has one of the highest proportions of young people in VET, combined with very low youth unemployment. At the same time, pathway flexibility and permeability towards higher vocational and academic programmes are comparatively high (Korber & Oesch, 2019). These systems show clearly that well-designed dual VET can be extremely effective. However, they also rely on conditions that are not easily replicated: long-standing industrial traditions, strong intermediary institutions, and highly coordinated labour-market governance.

4.2. Mixed and general-oriented models

The Netherlands combines a sizeable VET sector with a strong general upper-secondary track and high tertiary participation. Life-course earnings evidence suggests that vocational graduates do well initially, but university graduates tend to achieve higher lifetime incomes, with somewhat narrower gaps than in Germany due to higher overall quality and flexibility of pathways (Cörvers et al., 2010). Nordic countries, particularly Finland, emphasise the quality of general education and support for all learners. Adult skills surveys (PIAAC) show that Finnish adults with upper-secondary education have literacy and numeracy levels comparable to tertiary graduates in some other countries, highlighting the importance of strong foundational skills for long-term employability and entrepreneurship potential (OECD, 2023). These examples are particularly relevant for E4E because they show how education systems can create **broad competency profiles** that support not only employment but also entrepreneurial initiative in diverse sectors.

4.3. Croatia: high VET participation with incomplete dualization

According to Cedefop and the Croatian Agency for Vocational Education and Training and Adult Education (AVETAE), Croatia has around 70 % of upper-secondary students enrolled in VET programmes, one of the highest shares in the EU. At the same time, the early school-leaving rate is among the lowest (2.3 % in 2022). The Croatian VET system is heterogeneous: it includes four-year programmes that give access to the state matura, three-year programmes, apprenticeship-type programmes (crafts), and a recently introduced dual model piloted from 2018 onwards (ASOO, 2016; Cedefop & AVETAE, 2023). Strategic documents (e.g., NPRSO) emphasise the need to

strengthen work-based learning and cooperation with employers, while simultaneously calling for higher quality and internationalisation of higher education (MZO, 2023). However, implementation has been uneven, and public discourse often simplifies the message to “more practice” and “more STEM”, without fully considering long-term trade-offs or the specific needs of entrepreneurship education.

5. Empirical outcomes: transitions, earnings and adaptability

The comparative evidence confirms three robust patterns. First, **dual VET systems are highly effective in the early career phase**. Youth unemployment tends to be lower in countries such as Germany, Austria and Switzerland, and VET graduates quickly move into stable employment, often in the firms where they trained (Hoidn & Štastný, 2021; Burkert & Seibert, 2007). Second, **general and university education tends to dominate in the later career phase**. Across multiple countries, researchers find that while vocational graduates have an earnings advantage in early adulthood, this advantage diminishes and is often reversed by mid-career and later life, as university graduates enjoy steeper wage trajectories and greater mobility (Golsteyn & Stenberg, 2017; Cörvers et al., 2010; Korber & Oesch, 2019). Third, there is an emerging consensus that **workers with narrowly specific vocational skills are more vulnerable to technological change** than those with broader general skills, especially when industries decline or restructure (Woessmann, 2017). For entrepreneurship, this implies that VET alone may be sufficient for starting a business in a familiar sector, but broader general and higher-education skills can be decisive for scaling, diversifying, innovating and surviving in volatile markets.

6. Normative implications for Croatia: dual, professional and university education

In Croatia, policy discourse has in recent years tended to privilege dual and professional education, often under the slogan that the system must become “more practical” and “closer to employers”. While this is understandable in light of skills shortages and employer complaints, it carries serious risks if not balanced by a clear understanding of the distinct roles of different education levels.

From a normative standpoint, three critical issues emerge:

1. **Functional equivalence of professional and university degrees.** Through the CROQF, both professional (vocationally oriented) and university programmes at the same level formally occupy the same qualification level and carry the same ECTS credit load. However, an ECTS credit in a practice-oriented professional bachelor programme is not identical in epistemic depth or breadth to an ECTS credit in a university programme with strong theoretical and research components. Treating them as functionally equivalent in recruitment rules, particularly in the public sector, obscures their different missions.
2. **Disregard for discipline-specific expertise in hiring.** Empirical studies on the Croatian graduate labour market show that many graduates work outside their field of study, while positions requiring specialised economic, legal or engineering skills are often filled by candidates without such disciplinary backgrounds (Tecilazić, 2021; Tomaš, 2018). Public claims that there are “too many economists” or “too many social scientists” rarely account for this misallocation. The problem is not necessarily the number of graduates, but the lack of alignment between job content and educational profiles.
3. **Narrow framing of “practicality”.** In the debate on education for entrepreneurship, “practical” is often equated with immediate operability in current business processes. Yet entrepreneurial practice requires more than executing existing routines. It requires the capacity to reinterpret markets, reconfigure resources, navigate regulations and manage social and technological change. These higher-order capabilities are primarily cultivated in programmes that emphasise critical thinking, systems thinking and interdisciplinary perspectives—typically at university and postgraduate levels.

The author’s critical position is that **dual and vocational pathways are invaluable for operational excellence**, but they cannot substitute for **developmental and strategic capacities** that are central to entrepreneurship and innovation. A policy that implicitly downgrades university and research-oriented education in favour of short-term employer demands risks undermining the very foundations of a knowledge-based, entrepreneurial economy. For Croatia, this implies that education for entrepreneurship should not be confined to VET-level modules on starting a business. It should be built as a continuum:



- from high-quality general education (foundational skills, critical thinking),
- through VET (sector-specific operational competences),
- to university and postgraduate programmes (strategic, innovation and systems competences).

Only such a layered architecture can support both **entrepreneurship of necessity** and **entrepreneurship of opportunity**.

7. Conclusion

This paper has analysed different models of vocational and general education in Europe and their labour-market outcomes, with a particular focus on Croatia and implications for education for entrepreneurship. The evidence confirms that VET—especially in dual systems—plays a crucial role in reducing youth unemployment and facilitating rapid school-to-work transitions. However, it also shows that general and university education is associated with higher lifetime earnings

and greater adaptability to technological and structural changes. For Croatian policy-makers, the key message is that the choice is **not** between VET and university education, but between an **unbalanced system** that over-reacts to short-term pressures and a **balanced system** that supports both immediate labour-market needs and long-term developmental capacities. Dual and professional pathways should be strengthened where they are genuinely needed, but not at the expense of undermining the role of university education and research as core engines of strategic thinking, innovation and entrepreneurial dynamism. Education for entrepreneurship, in this sense, is not a marginal add-on to VET curricula. It is a cross-cutting mission that requires synergy between different education levels, institutional cultures and disciplinary traditions. Only by acknowledging and purposefully integrating the complementary strengths of VET and general/university education can Croatia build an education system with a truly long horizon—one that not only responds to today's labour-market demands, but also shapes the entrepreneurial opportunities of tomorrow.

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