



Skills2Capabilities Project Summary

Skills and capabilities are central to individual, economic and societal performance and well-being. Skills2Capabilities is undertaking a series of interconnected research projects to better understand how skills systems need to develop if they are to better assist people in making labour market transitions – transitioning in and out of employment, between jobs or across employers or sectors. The project focuses particularly on vocational education and training (VET) and adult learning (AL) programmes which are an important mechanism for ensuring that the skills and capabilities of the workforce are adequate to meet the demands of the economy and the aspirations of workers.

Traditional approaches to skills and skills mismatches build on human capital theory which sees the role of VET and skills systems as primarily that of supplying the skills to meet employers' current and near-term skill needs. An alternative approach is one that places more emphasis on skills provision which meets the intrinsic interests or capabilities of learners/individuals: the human capabilities approach. Skills2Capabilities sees these two models as complementary. The provision of skills can operate to meet the demand for skills in the wider economy and provide individuals with choice and the opportunity to flourish.

The findings from Skills2Capabilities will provide guidance on how to ensure better matching between the supply and provision of skills and capabilities with employer demand – both current and

Skills2Capabilities, a Horizon Europe study, is about understanding how skills systems need to develop if they are to assist people to make labour market transitions – i.e. between jobs, employers or sectors – and thereby reduce the level of skill mismatch which might otherwise arise.

This Policy Brief is part of the Dissemination Work Package and brings together results from across the entire Skills2Capabilities project.

For more information please visit skills2capabilities.eu

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future ones. Skills2Capabilities applies a multi-perspective, inter-disciplinary approach which brings together a diverse set of related skills mismatch issues in one comprehensive project with the following and overarching objectives:

1. improve the effectiveness of skills and lifelong learning policies in enhancing the responsiveness, proactiveness and resilience of VET and AL systems;
2. identify emerging patterns of skill demand and associated skill mismatches;
3. determine and analyse institutional responses to emerging patterns of skill demand and mismatches; and
4. identify lessons for policy and practice: understanding pathways to developing and enhancing VET systems of support.

Table 1: Partner Organisations

| No | Participant organisation name | Country |
|----|----------------------------------------------------------------------------|-------------|
| 1 | 3s Research and Consulting (Lead partner) | Austria |
| 2 | Institute for Employment Research, The University of Warwick | UK |
| 3 | Research Centre for Education and the Labour Market, Maastricht University | Netherlands |
| 4 | Federal Institute for Vocational Education and Training (BIBB) | Germany |
| 5 | Tallinn University | Estonia |
| 6 | Finnish Institute for Educational Research, University of Jyväskylä | Finland |
| 7 | Fafo Research Foundation | Norway |
| 8 | University of Padova | Italy |
| 9 | Institute of Philosophy and Sociology, Bulgarian Academy of Sciences | Bulgaria |
| 10 | Technical University Dortmund | Germany |

1. Introduction

The overarching theme of Skills2Capabilities is to examine how far it is possible to integrate a human capital approach to skills (typically associated with Becker, Schultz, and Mincer) with the capabilities approach (typically associated with Sen and Nussbaum). These are potentially complementary approaches insofar as, simply put, the former addresses the economic value of skills in the labour market, whilst the latter addresses how skills system can confer a range of benefits on individuals which extend beyond, but include, economic or monetary ones. National vocational education and training (VET) and adult learning (AL)

systems across Europe reveal a substantial amount of variation. By examining the variation from, respectively, human capital and capabilities perspectives, across different parts of national VET and AL systems, it is possible to gauge the extent to which each approach or perspective is evident (or has become more or less evident). This will be undertaken through a range of interconnected work packages (WP), which are summarised in Table 2 below.

At the government level, the complementarity of the two approaches is examined by scrutinising national skills and lifelong learning strategies to gauge the extent to which they pursue, respectively, economic or social goals. A key question here is whether “skills” are defined mainly from an economic point of view or whether skill strategies emphasise the importance of skills and education from a societal perspective (this is pursued in WP2, see also section 2 below). At the level of VET institutions, the question is how the provision of VET and vocational profiles, respectively, have changed over time in response to technological and social change (this is addressed in WP3; see also section 3 below). At the level of VET occupations, the focus is on how occupational training programmes have adapted to meet 21st-century skill needs, which include both technical, social and emotional skills (this is the focus of WP6; see also section 4 below). There is also a regional dimension to the analysis which looks into the way in which skills supply and demand influence one another (this is a focus of WP4, see also section 5 below).

Table 2: Research Workpackages of Skills2Capabilities

| Project Title | Lead Organisation |
|-------------------------------------------------------------------------------------------------|-------------------|
| 2. The effectiveness of skills policies | 3S |
| 3. The responsiveness and proactiveness of VET systems | FAFO |
| 4. Challenges and changes in the demand for VET skills | BIBB |
| 5. Drivers and effects of skills mismatch | TLU |
| 6. The supply of skills and lifelong learning among VET graduates over the life course | ROA |
| 7. The role of policy, services and stakeholders in supporting VET systems: Innovative practice | IER |
| 8. Funding VET and AL and the sharing of costs | IER |

Note: Workpackage 1 (project management) and 9 (dissemination) are not research based.

In the subsequent sections, we summarise and highlight a few preliminary findings.

2. Assessing the strategic effectiveness of skills policies (WP2)

Education and skills are central for economic performance and societal well-being. This insight has been increasingly addressed by policy-makers at national and European levels. Over a relatively short space of time, the content of people's jobs has changed in response to the changing demand for goods and services and the introduction of new production methods (especially those linked to digitalisation). As a consequence of the change in job task requirements, the demand for skills has changed, which has prompted changes in education and training curricula. Countries have adopted differing approaches to meeting emerging skill needs which may well account for the differing outcomes vis-à-vis skills provision observed across Europe. Many of these strategic changes are captured in policy documents which set out, amongst other things, the goals of the skills system and how it should support employment and industry. Despite the importance attached to strategic skills policies, a systematic comparison of policy documents – along with the implementation of the changes they specify – is missing. This leaves a substantial gap in our understanding of why national VET and AL systems have responded differently to the same types of external change (e.g. technological and demographic changes, the green agenda, etc.). To fill this research gap, Skills2Capabilities has undertaken a comparative case study of six European countries.

Led by 3s (Austria), the research team has analysed strategic policy documents on skills in six countries: Bulgaria, Germany, Italy, Austria, Norway and England (UK). Preliminary findings show that countries' approaches to strategic policy making, policy design, and policy implementation vary greatly. Evidence suggests that **one-size-fits-all models for strategic policy making are inadequate**, with policymakers having good reasons to apply varying approaches reflective of their particular aims and contexts. Trade-offs are evident in policy documents. This is particularly noted in the balance between economic and social goals that are embedded within skills strategies and policies.

3. Assessing the responsiveness of VET to changes in the field of work (WP3)

As part of the Skills2Capabilities project, a team led by researchers from Fafo Research Foundation (Norway) are assessing the responsiveness of vocational education and training (VET) programmes to changes in the field of work. The project compares curricula for three VET professions (heating and ventilation technicians, health care workers, and industrial mechanics) across six countries to understand how VET training curricula respond to changes in the field of work. The case studies contain three distinct but interconnected elements: change in the content of VET, the process of change, and changes in the work field.

In 2023, the Skills2Capabilities team conducted a pilot study of some of the case study occupations. Overall, the pilot study indicates that even though the selected occupations have been subject to substantial changes in both technology and work tasks, VET curricula do not change to the same extent. In fact, changes are, in some cases, only minor. This seems to hold true across different systems of VET found within the national case studies.

Does this mean that the mechanisms for responsiveness are poor, or is it a rational and deliberate way of coping with rapid changes? So far, it seems to be a strategic choice taken within most of our cases to formulate curricula in rather general terms. **Curricula are often open, not tied to a specific technology and are generally not changed very often.** This allows for flexibility in different ways, in time, to absorb a degree of change in the work field without having to change curricula. But also in many cases, in ‘space’ to allow for local adaptations of curricula, for differentiation between different providers, etc. Why are the curricula open and flexible? Is there consensus between the stakeholders on this approach? What are the merits and disadvantages of this approach? These are among the questions the project will pursue further.

4. The supply of social, technical and emotional skills (WP6)

Led by researchers at ROA (the Netherlands) with support from UNIPD (Italy) and TLU (Estonia), Skills2Capabilities examines the supply of skills through VET systems. One part of this work package uses text-mining techniques to assess the extent to which various 21st-century skills – that are key to developing one’s capabilities – are included in nationally defined study profiles for vocational higher education and how curricula meet these defined skills. Two projects from ROA provide preliminary results for the Dutch case.

The first project in this area uses data from 2012 and 2023 (sourced from the *Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven*) and maps that onto the O*Net skill taxonomy. Findings indicate that **curricula have undergone targeted enhancements in specific sectors: technical sectors are strengthening technical skills, while sectors requiring high social interaction are enhancing social skills.** The research team has developed an intensity index to quantify and differentiate the focus of these programmes and integrated the MBO (secondary vocational education) graduate survey with curricula data in order to link skills taught to actual labour market outcomes. The results shown in the figure below suggest that those with a broader range of technical skills are more employable but also more likely to experience skill mismatches due to delays in updating programmes (see Table 3). Those with strong resource management skills generally earn higher wages. Going forward, the research will study the specific returns of skill updates and verify the implementation of curricular changes within schools. The aim is to provide insights for aligning educational programmes with labour market needs, supporting a more adaptable and skilled workforce.

Table 3: Correlation between Skills and Labour Market Outcomes – results from WP6

| | Employed | Reported Skill Mismatch | Self-reported Wage |
|----------------------------|----------------------|-------------------------|--------------------------|
| Social Skills | 0.307** (0.1227) | 0.420*** (0.1531) | 496.82* (300.8277) |
| Technical Skills | 0.485*** (0.1367) | 0.462** (0.1783) | 221.70 (349.6582) |
| System Skills | 0.280** (0.1199) | 0.356** (0.1499) | 813.429*** (289.6734) |
| Resource Management Skills | 0.352*** (0.1000) | 0.191 (0.1227) | 856.31*** (238.704) |
| N.obs | 6144 | 4369 | 3667 |

Note: all estimations are controlled with *Education Program Levels, Year, Race, and Gender*. Mismatch and wage estimations are controlled with *occupation*. Wages are trimmed 5% observations. Insignificant skills results are omitted here.

A second study from the ROA team looks at socio-emotional skills in applied higher education (HBO VET) curricula to see if college programmes adequately prepare students for the complexities of the contemporary job landscape. To do this, the team is looking at how socio-emotional skills are integrated into learning objectives, assessing whether graduates find these skills relevant in their work and the degree of alignment between skills taught and those needed in the workplace. The methodology for this project evolved from a literature-based framework to a more nuanced one, incorporating the Big 5 personality traits and the BESSI questionnaire (Behavioural, Emotional and Social Skills Inventory). Further, the team have developed a classification model which measures non-routine skills using GPT architecture. This is an innovative approach which provides a ‘proof of concept’ employing a method not previously utilised in skills research.

Together these two projects are creating an evidence base and new methodologies for understanding changes in the supply of skills and capabilities.

5. Drivers of regional change to skill demand (WP4)

Skills2Capabilities researchers are examining the drivers of changes to skill demand, with a special focus on subnational regional variations. Led by BIBB (Germany), researchers are identifying drivers of economic transition (e.g. globalisation, technological change, etc.) which have given rise to changing skill demands. The team will present a national and regional analysis of skill demands. These findings will provide important context for the study which examines vacancy data to determine regional skill demand. In this project, the team is using online job advertisements (commercially acquired from Textkernel for the year 2022), to identify demand for particular skills and the recruitment strategies employed by firms seeking to fill job vacancies. The research focuses on three particular occupations – industrial mechanic, ventilation technician and warehouse logistics operator (providing the opportunity for cross-pollination with WP3). The skills identified in job announcements

for these occupations will be matched with the ESCO ontology, which consists of 13,939 skills. Linking the online job advertisement data with ESCO ontology, the research team will use an open-source large language model, Mistral 7b, to train the data and enable the matching of skills, recruitment strategies and regions.

The assumption is that companies operating in regions that are less attractive, are in transition, have high skill shortages and exhibit low economic strength will demand more transversal and cross-sectoral skills compared to occupation-specific and sector-specific skills. **More transferable skills are important for adapting to changing job tasks, but could also be a strategy to lower requirements and appeal to a larger pool of applicants.** This examination of regional disparities in skill requirements will enable the research team to provide insight into how regional factors shape demands for particular skills within VET occupations and how companies adapt their strategies accordingly. An example of regional findings from Germany's spatial distribution of employees working in knowledge-intensive industries is demonstrated in Figure 1, emphasising the importance of regional structural change.

Figure 1: Regional analysis of share of employees working in knowledge intensive industries, Germany



6. Policy Implications and Conclusion

Skills2Capabilities is undertaking innovative research which brings together new methodologies, original data collection and deep comparative analysis to shed new light on how the field of skills is changing and will need to change in the future. While policy

recommendations would be premature at this point, it is worth highlighting at least two areas in which this work speaks directly to policy. Firstly, space matters – regional differences at the subnational level and across country differences all underscore the importance of spatial context. Institutional arrangements, economic conditions and transitions, and policy environments have a bearing on how skills are supplied and utilised in the labour market. Secondly, innovative methodologies bring new insights – the project utilises innovative technologies and introduces them into the skills research field. This provides an opportunity to understand the challenges in a new framework. But caution must be taken as some of these are not as robustly tested as more traditional approaches.

Over the next two years, more research from across the Skills2Capabilities research portfolio will be produced and made publicly available on the project website Skills2Capabilities.eu and on [LinkedIn](https://www.linkedin.com/company/skills2capabilities). Please visit the website for the latest news and information, and to read working papers such as:

- [The effectiveness of school-to-work alternative programmes in Italian high schools](#)
- [A framework for assessing VET systems](#)
- [A report on country case studies on skills strategies](#)

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This working paper represents the views of the authors based on the available research. It is not intended to represent the views of all Skills2Capabilities affiliates.

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