Applying the Capability Approach to Vocational Curriculum: Synthesis of Qualitative and Quantitative Insights

Skills2Capabilities Working Paper

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ABSTRACT

This working paper explores vocational curricula through a comparative lens, drawing on diverse national cases, occupations, and methodological approaches. Within the Skills2Capabilities project, Amartya Sen's Capability Approach (CA) serves as a unifying analytic framework. Using empirical data from Work Packages (WP) 3 and 6, this working paper demonstrates how the CA can be applied across multiple levels of analysis and curriculum design. The starting point is the Dutch case, where a quantitative text-as-data analysis of more than 600 upper-secondary vocational education (MBO) programmes provides evidence on how curriculum updates influence learners' labour market outcomes such as employment, wages, and perceived skill mismatches (Zhu et al., 2024). These findings demonstrate the role of changes in the intended curriculum at the system level. Complementing this systemic perspective, the English case study draws on interviews with teachers and decision-makers across three occupational fields (Care, Heating Ventilation and Air Conditioning (HVAC), and Industrial Mechanic). It examines the relationship between the intended and the implemented curriculum at the college level, showing how policy requirements are translated into practice. The German case focuses on the realised curriculum at the individual level, based on interviews with teachers and learners in Nursing and Plumbing/Heating (SHK). It asks whether vocational training processes foster the development of capabilities in Sen's sense, extending the analysis beyond employability to learners' opportunities for agency and personal growth. Taken together, the three cases

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.

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provide a multi-layered view of vocational curricula across system, institutional, and individual levels, highlighting the value of integrating curriculum theory with the Capability Approach while also identifying promising directions for future research.

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Introduction

In the Skills2Capabilities project, we apply the Capability Approach (CA) — originally developed within developmental economics (Sen, 1979) — to the field of Vocational Education and Training (VET). Why could this be a fruitful connection? After all, VET in Europe is a well-established component of both education and labour market systems, and also a mature field of research. Two main arguments make this combination particularly interesting. First, there is an ongoing trend in VET towards a stronger emphasis on personal, social, and general competences as educational objectives. Equipped with such competences, tomorrow's skilled workers will be better prepared to adapt to changes in work, the economy, and technology than if they were trained solely in technical or occupational skills. We have taken this as the general working hypothesis of the project and as a key theme running through its various sub-projects. In its normative orientation, this assumption corresponds closely with the Capability Approach, which — beyond the functioning of economies and societies — places the individual's personal development, flourishing (to use Sen's language) and the conditions enabling it at the centre of both research and policy design.

Second, the Capability Approach is recognised across several academic disciplines and lends itself to developing shared questions within interdisciplinary research. This interdisciplinarity is an equally important feature of European VET research, which is characterised by diverse methodological and disciplinary traditions.

The general hypothesis of an increasing personalisation and generalisation of VET programmes and qualifications is tested throughout the project, and in WPs 2, 3, and 6, in connection with the analysis of vocational curricula. This report focuses on quantitative and qualitative research conducted in WPs 3 and 6, which address these overarching questions through the analytical categories derived from the Capability Approach. Thus, the major aim of this report is not to present new findings of research but to locate and map some of the research undertaken in the project within the CA.

The guiding questions for this exercise are the following:

1. What are the effects of curriculum changes, and how does the curriculum influence teaching and learning in VET?
2. How can the categories of the CA be applied to the analysis of VET and, in particular, to VET curricula?
3. What are the benefits more generally of using the CA approach to analyse VET?

The remainder of this paper presents three national case studies – The Netherlands, England and Germany – each illustrating how the CA can be applied to different levels of vocational curriculum analysis.

Conceptual Framework

It is not possible here to present all the different varieties and the full scope of the Capability Approach. For the purposes of this report, therefore, only a few key aspects will be highlighted. In this project, the CA is essentially understood as a research framework (Robeyns, 2017) that — with its conceptual elements — supports the identification of relevant information in regard to questions related to wellbeing and social justice. For the analysis of VET curriculum this needs to be combined with a model of the curriculum.

Core Concepts of the Capability Approach

A central point is that the CA, developed by Amartya Sen, was formulated in opposition to classical welfare economics, which he found inadequate for explaining economic and social development. Sen's critique was directed mainly against the assumption of the utility-maximising individual, who is presumed to make rational decisions based on fixed individual preferences: "The purely economic man is indeed close to being a social moron" (Sen, 1977, p. 336). Instead, and against the backdrop of his work on developing countries and their economies, Sen is particularly concerned with the conditions for free choice and preference formation: "Preference formation through social interaction is a major subject of interest" he explains, and "(...) It is also important to recognize that agreed social arrangements and adequate public policies do not require that there be a unique "social ordering" that completely ranks all the alternative social possibilities. Partial agreements still separate out acceptable options (and weed out unacceptable ones), and a workable solution can be based on the contingent acceptance of particular provisions, without demanding complete social unanimity." (Sen, 1999, p. 253) This concern fundamentally distinguishes the CA from classical economic welfare theories and broadens its analytical and normative scope to the individual and the collective processes of identifying which ways of living are worth pursuing.

Some of the core concepts of the CA are presented below. Figure 1 illustrates the relationships among these concepts according to a paper by Forcher-Mayr & Mahlknecht, 2019 who have used the CA as a background concept for the development of Vocational Curricula.

While classical economics tends to treat preferences as a "black box", assuming them to be given and stable, the CA places the formation of preferences and conceptions of a good life at the very centre of analysis. For Sen, education is therefore not merely about enabling people to function effectively or to earn an income, but also about fostering the reflective development of one's own preferences, values, and visions of a worthwhile life. In this sense, education contributes both to human freedom and to the capacity for critical self-determination — empowering individuals to decide not only how to live, but why certain ways of living are worth pursuing. Complementary to its economic function, education is an end in itself. It "...not only causes freedom, capabilities and development, it is also constitutive of both." Sen's exposition of capability thus elides different meanings and connotations of education and schooling – namely aims, processes and outcomes (Unterhalter, 2003, p. 12).

The capabilities approach initiated by Sen, and the human capital theory associated with Becker, Mincer and Schultz, are not necessarily the enemy of one another, some authors claim, they can be complementary (Chiappero-Martinetti & Sabadash, 2014). Human Capital Theory explains participation in training or skills development in terms of expected monetary returns for various actors – employers, individuals and government respectively – which in turn influences who invests in skills and to what extent. The capabilities approach, by contrast, emphasise individuals' agency to pursue a wider range of goals they value. Since exercising such agency often requires economic resource, the CA should not be seen as incompatible with Human Capital Theory. To be fair, IVET programmes, are rarely shaped solely by labour market considerations – their remit includes fostering competences that enable full participation in society. What is of interest is the degree to which the content of both intended and implemented curricula reflects either a capability- or human capital-oriented perspective. Differences across countries are likely rooted in the philosophical and theoretical traditions that have shaped national curriculum design, as well as practical constraints faced by programme designers.

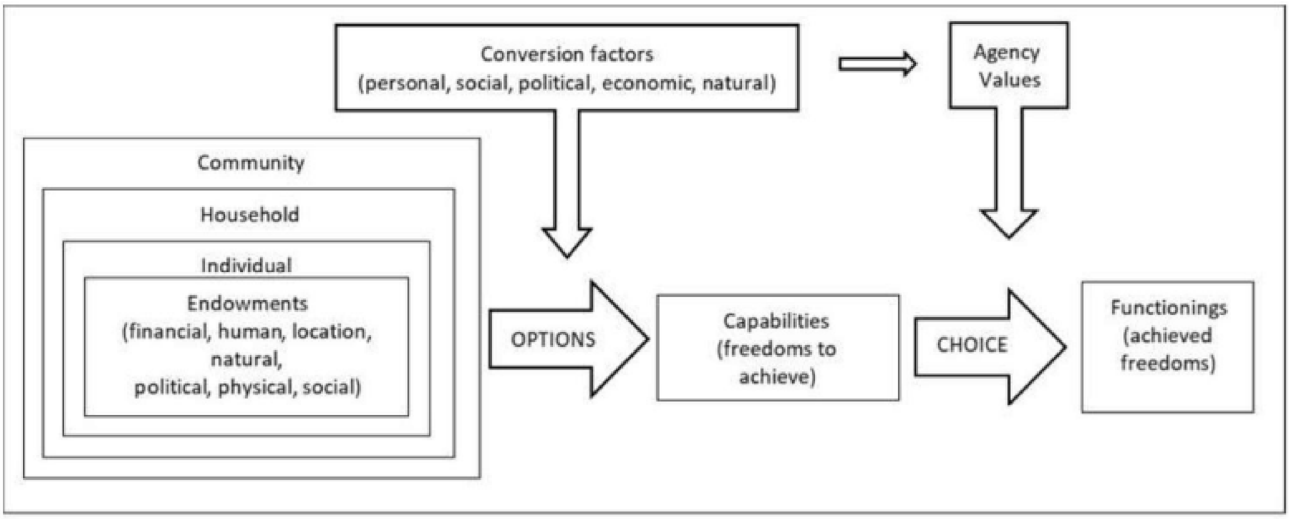

Figure 1: Categories and Concepts of the Capability approach according to (Forcher-Mayr, 2021; Forcher-Mayr & Mahlknecht, 2019)

Capabilities

Sen argues that well-being and development should not be assessed merely in terms of material wealth or access to goods, but rather in terms of the real freedoms individuals have to pursue lives they have reason to value (Sen, 1999, p. 293). These real freedoms are conceptualised as "capabilities", and their realisations are referred to as "functionings" (see further below).

In the context of VET, the CA offers a way to understand education as and end in itself and not only as an instrument for employability or productivity, but as a means for expanding learners' genuine opportunities to lead meaningful professional and personal lives.

Endowments

Endowments refer to the personal, social, and economic resources that individuals possess before entering an educational or occupational pathway. These include prior education, health, motivation, family background, and social support networks. In VET, learners' endowments strongly influence how they can benefit from training. For example, prior school achievement or family encouragement may affect learners' ability to enter and/or complete an apprenticeship successfully.

Conversion Factors

Conversion factors are the conditions that determine how resources and institutional opportunities can be transformed into real capabilities. According to Robeyns (2005, p. 98, 2017, p. 45) we can distinguish personal, social, and environmental conversion factors.

- Personal conversion factors include physical and mental health, learning capacity, and motivation.
- Social conversion factors comprise cultural norms, gender roles, workplace hierarchies, and pedagogical relationships.
- Institutional conversion factors, which are especially relevant in VET, include the structure of training systems, cooperation between schools and companies, assessment regimes, and funding frameworks.

In practice, conversion factors explain why identical formal opportunities may lead to very different outcomes for different learners or institutions.

Options and Capability Sets

Options describe the range of potential choices available to an individual within a given context — for instance, the variety of occupational fields or learning pathways open to a VET learner. The capability set refers to the real, feasible options that a person can actually pursue, given their endowments and the conversion factors surrounding them. A curriculum that offers flexible learning routes, reflection time, or exposure to innovation expands learners' capability sets, while rigid, assessment-driven structures may restrict them.

Capabilities and Functionings

Capabilities are the substantive freedoms that people have to choose and achieve valued ways of doing and being. In education, these include the ability to learn, to apply knowledge creatively, to collaborate, to reflect, and to adapt to change.

Functionings are the realised aspects of life that result from the exercise of capabilities — what people actually achieve. In VET terms, functionings can include occupational competence, employability, professional identity, and social participation. Finally, it can also include employment itself or the income achieved.

Agency and Agency Values

Agency refers to the ability of individuals to pursue goals that they value and to act on them. In the CA, agency extends beyond economic productivity to include self-determination, critical thinking, and civic engagement. Agency values denote the underlying motivations and purposes guiding a person's choices — such as contributing to society, mastering a craft, or supporting others. In VET, recognising agency means valuing learners not just as future workers, but as active participants shaping their own professional and personal pathways. According to Scholtes, Neff and Lampe (2018), the CA holds that human development should be conceived of in terms of the expansion of people's positive freedoms, which includes not only freedom from constraint but also real opportunities (Sen, 1999). Freedom matters as an end in itself because it has intrinsic value, which Sen considers to be neglected by conventional welfare economics.

Drèze and Sen (2005, p. 14) describe five distinct ways in which education and health can be valuable to the freedom of a person and hence influence her well-being:

1. Intrinsic importance: Being healthy and educated are valuable achievements in themselves. Being healthy and / or educated can have a direct effect on a person's freedom and her well-being.
2. Instrumental personal roles: Education and health enables a person to do many things which she otherwise might not be able to do, such as getting a job, reading a newspaper or playing soccer. In this sense health and education are also necessary preconditions to achieve well-being.
3. Instrumental social roles: Health and education are essential to the practice of democracy by for example enabling people to participate and articulate and express their views.
4. Instrumental process roles: Health and education can also have an instrumental process role in the sense that for example the expansion of schooling can reduce the distressing phenomenon of child labour.
5. Empowerment and distributive roles: Especially education can have an empowerment and distributive role since literacy and educational achievements can empower a person and help them to resist oppression. This can lead to redistributive effects between social groups, households and within family.

In summary, the CA provides both a conceptual vocabulary and an orientation for analysing education systems. When applied to vocational education, it enables a broader understanding of how curricula, institutions, and policies contribute not only to employment outcomes but also to learners' ability to exercise freedom, develop identity, and engage meaningfully in society.

Capability Approach, Curriculum Theory, and Levels of Analysis

Curriculum theory has long recognised that there are several distinct levels at which educational content is defined, interpreted, and enacted and experienced (e.g. Goodlad 1979). Often the literature distinguishes between the intended, implemented, and realised (or attained) curriculum. This distinction has become a common approach in educational research, especially for linking macro-level policy intentions with micro-level learning experiences.

Intended curriculum refers to the officially prescribed aims, content, and structures of learning as formulated by policymakers, qualification authorities, and curriculum designers. It expresses what learners should know and be able to do, and expresses the social, economic, and pedagogical expectations placed upon education systems. Within the framework of the CA, the intended curriculum corresponds to the system-level options that are formally made available to learners and institutions. These options define the scope of potential learning opportunities within a given educational system — but not yet the actual freedoms that learners can realise. This, however, is particularly relevant, when it comes to the individual perspective that is emphasised by the CA.

The implemented curriculum concerns the ways in which teachers, schools, and training institutions interpret and deliver the prescribed content. It reflects how policies and curricular frameworks are enacted within real institutional settings (Billett et al., 2018). Implementation is influenced by contextual factors such as funding regimes, institutional autonomy, teacher expertise, and employer participation. From a capability perspective, this level involves the conversion factors — personal, social, and institutional conditions — that determine how intended opportunities are translated into practice. It is also where specific functionings emerge: concrete actions and outcomes that result from institutional efforts to support meaningful learning of individuals.

The realised curriculum represents what learners actually experience and achieve — the knowledge, competences, attitudes, and forms of understanding that they internalise through their learning process. Within the CA, the realised curriculum aligns with capabilities and agency at the individual level.[1] It focuses on learners' real freedoms to choose among valued learning pathways, to reflect critically, and to act autonomously in their professional and personal lives.

Taken together, these three levels of curriculum — intended, implemented, and realised — can be mapped with the multi-level architecture of the Capability Approach:

- at the system level, the intended curriculum defines options and sets the structural boundaries of opportunity for the individuals in VET; and
- at the institutional and regional level, the implemented curriculum embodies conversion factors and shapes the functionings that individuals can achieve.
- at the individual level, the realised curriculum concerns capabilities and agency, the extent to which learners can transform opportunities into educational and professional achievements they have reason to value. These can be economic outcomes as well as certain agency values and more intrinsic achievements.

This integrated perspective allows curriculum research not only to trace policy implementation processes but also to assess the extent to which vocational education expands learners' substantive freedoms — their capabilities to be and to do — rather than merely transmitting occupational competences.

Vocational curricula and the Capability Approach: multiple perspectives and challenges

The intention is to show that combining curriculum theory with the CA can provide a multi-level perspective for the analysis of VET. When the two perspectives are brought together, several complementary analytical viewpoints emerge.

First, a systemic perspective can be adopted, which views curricula and qualifications as frameworks that define the structural conditions and expected results of learning within a VET system. From this macro-level observation, the intended curriculum and its policy environment shape the options available to institutions and learners. This perspective highlights how institutional arrangements — such as assessment systems, governance structures and funding mechanisms or curricular renewal — affect the scope of educational opportunity and the distribution of learning outcomes across the system.

[1] In WP3 we have broken this down into Skills, Holistic Vocational Competence and Capabilities Chen et al. (2025, forthcoming).

Second, a process-oriented perspective focuses on the dynamics of curriculum implementation and the day-to-day interactions that constitute teaching and learning. At this meso-level, attention shifts to the conversion factors — personal, social, and institutional — that determine how curricular intentions are transformed into concrete educational practices and experiences. This processual lens captures how teachers exercise agency in interpreting curricula, how cooperation between schools and workplaces unfolds, and how learning environments either expand or restrict students' possibilities for meaningful learning.

Third, an individual-centred perspective places the learner at the heart of the analysis. It asks how learners convert the opportunities provided by the system and institutions into actual capabilities and functionings. This perspective examines how vocational learning contributes to the development of agency, identity, and reflective judgement, and how it supports learners in forming their own values and preferences regarding a good and meaningful professional life.

In addition to these analytical perspectives, the CA also enables a comparative conceptual reflection.[2] Its categories — such as agency, capability, and freedom — can be contrasted with the normative assumptions embedded in specific VET traditions, policy frameworks and curricula. For example, comparing the CA's emphasis on individual freedom and well-being with the often competence- and employability-oriented objectives of VET systems can reveal both convergences and tensions.

Each of these perspectives corresponds to different layers of research findings and methodological challenges. Table 1 illustrates the perspectives that were taken in the research approaches that are presented in this synthesis paper.

Table 1: Details on cases analysed in this synthesis

Country	Occupational fields / Occupations (examples)	Level of Analysis	Notes
Netherlands (MBO system)	All occupational programmes registered in the Centraal Register Beroepsopleidingen (Central Register of Vocational Training, CREBO), nine fields and 4 levels of the Dutch qualification structure.	System-wide / Intended Curriculum and (quantitative, text-as-data, linked to outcomes)	Quantitative analysis of all >600 MBO programmes, systematically captured via CREBO codes; outcome measures oriented towards HCT (employment, wages, mismatch).
England	Care (Health & Social Care)- HVAC (Heating, Ventilation, Air Conditioning)- Industrial Mechanic (Manufacturing / Engineering Mechanic)	Implemented Curriculum (qualitative, interviews with teachers & decision-makers)	Focus on how the intended curriculum is translated into practice; comparison across three occupational fields.
Germany	Nursing (generalist nursing qualification)- Plumbing, Heating and Air Conditioning (Sänitär HK)	Realised Curriculum (qualitative, interviews with teachers & learners)	Focus on learners' experiences and whether training processes foster the development of capabilities in Sen's sense.

[2] A pathway that we have followed in the comparative analysis of intended curriculum in WP3 Chen et al. (2025, forthcoming) .

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The three country cases cover different levels of analysis within vocational education and training. The Dutch study operates primarily at the system level, analysing the intended curriculum through standardised national qualification files and linking them to labour market outcomes. The English study shifts attention to the regional, school, and college level, exploring how actors implement national curricula in three occupational fields, thereby capturing the implemented curriculum. The German case moves further towards the individual level, examining the realised curriculum through the perspectives of teachers and learners in two occupations, and asking whether training processes enable the development of capabilities. Taken together, these complementary perspectives connect systemic, institutional, and individual dimensions of vocational curricula, providing a multi-layered understanding of how capabilities can be fostered across contexts.

The Netherlands: Intended Curriculum and Labour Market Functionings

The Dutch system of upper-secondary vocational education (middelbaar beroepsonderwijs, MBO) trains around 40% of all students and is highly standardised at the national level. Programmes are clustered in nine occupational sectors and offered at four Dutch qualification levels (1–4, ISCED 3–5). Learners choose either the school-based track (BOL) with 20–60 % practical training or the work-based track (BBL) with > 60 % workplace learning (Zhu et al., 2024, p. 6).

All curricula (kwalificatiedossiers) are developed and updated by the Samenwerkingsorganisatie Beroepsonderwijs Bedrijfsleven (SBB). Since 2012, they have been fully standardised nationwide. Every curriculum is evaluated on a five-year cycle; about 20 % are revised annually through a fixed procedure involving SBB, schools, and sectoral branch organisations (Zhu et al., 2024, pp. 7–8). Updates are legally mandated and treated as quasi-exogenous reforms in the methodological design of the Dutch study.

Accordingly, the study was applied to the whole middle level VET system (MBO) in the Dutch setting, including all vocational programmes allowing therefore for a macroscopic view on the outcomes of VET and VET curriculum reform.

Method: a quantitative design using curriculum text-as-data and labour market outcomes

Using the publicly available curricula (from 2012–2023), the authors of the study applied Natural Language Processing to extract all skill descriptors according to a coding grid developed on the basis of skill domains within the O*NET content model. Each programme from the Central Register of Vocational Training, CREBO was mapped to six O*NET skill domains: 1. Basic skills, 2. Social skills, 3. Technical skills, 4. Complex problem-solving skills, 5. Systems skills, 6. Resource management skills. The calculation of relative frequencies yielded into programme-level skill indices that were then merged with individual micro-data from the Dutch School Leavers Survey (2013–2022). Only those who directly entered the labour market after their graduation of VET were taken into the sample. The data within the Dutch school leavers' survey in addition to the VET programme provides information on labour market outcomes, such as employment, self-reported match, mismatch, working hours and wages.

Mapping to the Capability Approach: macroscopic view with focus on functionings

When interpreted through the lens of the CA, the Dutch study – with its macroscopic view - primarily represents the intended curriculum at the system level. The analysis captures some dimensions of endowments, conversion factors, and functionings, but only indirectly addresses capabilities and agency values.

Endowments, conversion factors, and functionings in focus

The study controls for basic endowments such as age, gender, and ethnicity (Zhu et al., 2024, p. 12), treating them as background characteristics that may influence outcomes. These factors, however, are not theorised as socially or institutionally shaped — rather, they remain external to the analytical framework.

Important conversion factors are embedded in the institutional structure of the Dutch MBO system. These include the programme level, the training track (school-based BOL vs. work-based BBL), and the occupational sector(Zhu et al., 2024, pp. 6–7). They define how educational inputs can be transformed into usable skills and thus shape the effectiveness of curricula across different learner groups and contexts. Skill indices derived from the textual analysis of curricula (Zhu et al., 2024, pp. 8–9) represent the formal learning opportunities offered to students. They make the "intended" dimension of the curriculum empirically visible and quantifiable and it is assumed that these changes in the taught content are also reflected in the actual competences of the learners.

While the study assumes that curriculum updates expand learners' capabilities, these are not directly observed. The authors infer that revised curricula increase opportunities for productive employment, yet they do not examine whether learners can actually choose and pursue valued professional pathways. By contrast, the actual functionings are measured explicitly through observable labour market outcomes such as employment, working hours, and wages (Zhu et al., 2024, pp. 12–13). These indicators capture achieved states of participation but remain within a human capital frame of reference.

Finally, agency values — that is, the individual and collective purposes learners attach to their professional development — are absent from the dataset. The quantitative design does not account for learners' aspirations, motivations, or evaluations of what they consider meaningful achievements, that they personally value.

In summary, the Dutch case exemplifies a very robust system-level approach that quantifies the relationship between curriculum design and labour market outcomes. It offers valuable evidence on the efficiency and responsiveness of vocational education but addresses the functionings rather than the capabilities of learners.

Curriculum Content revision and Labour Market Effects

Based on their analysis of the six skill indices that capture changes in different dimensions of content (and that are equalled with the competence of the students) the authors estimate the effects of curriculum updates on employment, wages, and skill mismatch. Based on the curricular content some associations with the CA can be made: while domains like technical and digital skills might be regarded as functionings in vocational practice, it is more likely that cognitive basic skills or social and communication skills are experienced as capabilities that go beyond the immediate instrumental functioning in work-practice. The analysis of the authors shows that individuals who completed updated vocational programs are more likely to be employed, work more hours, and earn higher monthly and hourly wages (Zhu et al., 2024, p. 12). However, the curriculum updates do not significantly reduce self-reported skill mismatches overall. Accordingly there is a clear positive relation between curricular updates and functionings. When examining the skill dimensions introduced by curriculum updates, the authors find that:

- Learning more complex skills (compared to basic skills) increases working hours and thus monthly earnings, though effects on hourly wages are not significant.
- Systems skills and technical skills yield the highest returns among all skill types.
- A higher amount of resource management skills reduce the probability of reporting skill mismatch.

Further analysis (Zhu et al., 2024, p. 13) shows that the effects of curriculum updates vary by gender and learning environment. For men, acquiring complex problem-solving skills increases the likelihood of employment, while technical and social skills lead to longer working hours and higher wages. For women, resource management skills improve employment prospects, and systems as well as social skills contribute more strongly to wage growth, particularly in terms of hourly pay. Although both genders benefit from acquiring additional skills, the magnitude and nature of these benefits differ according to the type of skill acquired. With regard to the learning environment, the findings suggest that social and resource management skills are most effectively developed in school-based programmes, while technical, complex problem-solving, and systems skills are better learned in work-based settings. This highlights the complementary nature of school- and work-based learning in fostering diverse capabilities relevant to labour market success.

Interpretation

The Dutch analysis quantifies how intended curriculum reforms translate into measurable labour-market functionings. It provides robust causal evidence that regular curriculum updates improve employability and earnings, especially through technical and systems skills. Yet, the focus remains within the standard human capital model — linking curricular skill supply to economic returns — while capabilities and agency values remain unmeasured. The study therefore represents a strong system-level reference case for understanding how VET institutions respond to changing skill demands within a harmonised national institutional framework.

The Dutch curriculum analysis provides an important reference point for this working paper. In a quantitative perspective, it demonstrates how vocational curricula can be systematically captured and linked to labour market outcomes. This makes visible not only the dynamics of curriculum updates, but also their effects on employment, wages, and perceived skill mismatches. The study highlights the central role of the intended curriculum — the formally prescribed training frameworks — for shaping opportunities to act in the labour market. At the same time, the outcome variables employed (employment, wages, mismatch) are primarily located within the paradigm of Human Capital Theory, rather than in a broader capability perspective. Some authors have suggested that such research could be complemented by a capability perspective (Chiappero-Martinetti & Sabadash, 2014) with adding relevant survey data, such as political participation or similar variables when available, but others have also taken more fundamental interpretations of the CA that, for example, stress the importance of multilevel analyses and different perspectives and the focus on interaction when applying the CA to education (e.g. Zimmermann, 2006, 2018)

The following sections present qualitative analyses from England and Germany, each addressing different dimensions of curricular reality. Drawing on the well-established distinction between intended, implemented, and realised curriculum (Goodlad, 1979), the English case focuses on the relationship between the intended and the implemented curriculum: how official requirements are taken up by schools, teachers, and administrators, and translated into concrete learning processes. The German contribution extends this perspective by also examining the realised curriculum, that is, the lived experiences of learners in training. At the centre of this analysis lies the question of whether - and to what extent – learners' experiences contribute to the development of capabilities as conceptualised by Sen (1999).

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In this way, the different methodological approaches complement each other: the Dutch investigation examines the effects of the intended curriculum in a quantitative design (albeit with an economic focus on outcomes), the English case study explores processes of implementation, and the German study captures the realised level through the perspectives of learners. Taken together, they provide a multi-layered picture of how vocational curricula in different countries contribute to young people's opportunities to expand their occupational and personal capabilities.

England: Implemented Curriculum and Institutional Conversion Factors

Apprenticeship and VET training in England operates within a complex regulatory and funding scheme. The Department for Education (DfE) oversees post-16 educational policy and sets national occupational standards, though as of October 2025 responsibility for apprenticeships has passed to the Department for Work and Pensions (DWP) which equates with Ministries of Labour found across Europe. Publicly funded further education colleges (FECs) offer courses on a range of programmes including general and vocational education. Awarding bodies play an important role, particularly when a nationally set standard includes a requirement for a qualification. In these instances, the awarding body will work to develop and award qualifications that are in line with occupational standards. FECs then implement and deliver training based on these qualifications. This may be through work-based routes such as apprenticeships or mainly school-based technical qualifications. While not all apprenticeships have an embedded requirement to complete a qualification, they are all subject to an End Point Assessment (EPA). These assessments are managed by an EPA organisation who are independent bodies, regulated by Ofqual (the regulatory authority for qualifications).

Content of apprenticeship training is nationally set. Previously this was undertaken by IfATE (Institute for Apprentice and Technical Education), an agency of the DfE. In 2025 this body was closed and its powers transferred to Skills England, another agency of the DfE, before being moved again this time to the DWP in 2025. Funding, until 2025, was under the control of the Education Skills Funding Agency (ESFA). In 2025, the ESFA's responsibilities were given to DfE (and then to DWP for apprenticeships). Each apprenticeship is assigned to a funding band, which is the amount of per-learner funding which a FEC will receive for delivering the training.[3] The source of these funds is from an apprenticeship levy, introduced in 2017, which is paid by employers with an annual payroll over £3 million). Employers who take on apprentices do not directly pay for the training; the cost is covered through their levy contributions.[4]

The result is that FECs, under the governance of the DfE (and now DWP), are paid a set per-apprentice price to deliver the school-based elements of an apprenticeship programme. If the apprenticeship standard contains an embedded qualification, an awarding body will oversee the assessment and awarding of the qualification. FECs will work with employers of apprentices to select an appropriate EPA organisation. It is estimated that an average of 13 per cent of the funding allocated for an apprenticeship is used to fund the EPA (AOC, 2025). FECs provide the in-school training elements and coordinate across the awarding bodies, EPA Organisations and employers.

The Richard Review (2012) criticised the apprenticeship systems' emphasis on qualifications due to concerns that learners were not developing occupational competencies. Following that review, qualifications were removed from many apprenticeship standards and replaced with EPAs which

[3] Private training providers also deliver formal learning elements for apprenticeships, however the focus of this case study is on the FE College's experience of delivery apprenticeship training.
[4] Changes to the Apprenticeship Levy have been announced (2025). It will be known as the Growth and Skills Levy and will give more flexibility to levy-paying employers on how to utilise their levy contributions.

were designed to evaluate the knowledge, skills and behaviours required for a given occupation. More than a decade on, there is concern that the current system is overly focused on the EPA.

Building on research undertaken elsewhere in the Skills2Capabilities project (WPs 2 and 3), this contribution focuses on the implementation of national standards for apprenticeship training in three specific occupations: heating and ventilation (HVAC), industrial mechanic, and health care workers. Research undertaken for WP3 of the project examined how the nationally prescribed training standards for apprentices in these occupations has changed in the first quarter of the 21st century. The employer-centred approach to apprenticeships in England - very much an exemplar of a liberal market economy's skills system - has experienced substantial change since the early 2000s, responding to frequent policy shifts and changes in the field of work due to, for example, new technologies and digitalisation. Despite the push to remove qualifications from apprenticeships following the Richard Review (2012), the three apprenticeships studied here (all at EQF Level 4) all retain required qualifications. The main change from a curricula perspective has been the shift from apprenticeship frameworks to standards. The former provided a detailed description of the skills, knowledge and behaviours to be acquired. Arguably, standards are less prescriptive providing more leeway for the apprenticeship to be flexed to meet the skill needs in a given occupation in response to changing patterns of skill demand.

In addition to curricula changes in response to policy initiatives from the national government, technological advances, particularly related to digitalisation, have had an impact on the field of work in the three occupations. Technology adoption is reflected the apprenticeship standards to varying degrees. In the case of health care workers, technology remains largely absent from the standards. Rather than naming particular technologies which are used to accomplish a task, the standard names the task which must be completed and leaves it to the FEC/private training provider and employer to determine which technologies would be most appropriate. For example, patient monitoring and taking blood pressure is listed as a required competency for this apprenticeship, but it does not say in which way this should be accomplished –utilising digital or manual equipment. However, the HVAC apprenticeship has demonstrated significant digitalisation within the field and within the standard which now includes specific skills such as Computer Aided Design (CAD) and Building Information Modelling (BIM). Industrial mechanics also have seen significant technological/digital developments requiring CAD skills and a move to computer-aided machining. In both the HVAC and Industrial Mechanics cases, these digital skills are reflected in the curricula (see Breines et al., 2025).

The lack of specificity within the standards, particularly evident in the case of the health care worker, leaves substantial room for variation in the implementation of the national standard. It is this question of implementation of set standards – which have varying degrees of specificity related to the skills required, but all of which are responsive to employer demands – which the remainder of this case examines.

Method: Qualitative Interviews with school leaders and curriculum directors

This report is based on qualitative research undertaken for the Skills2Capabilities project. The methodology combined a review of relevant policy documents and reports with semi-structured interviews to explore how further education colleges in England implement national vocational and education training curricula. Interviews were conducted with leaders and curriculum directors at three FECs in England. These interviews were held online via Microsoft Teams, recorded and transcribed (with consent).[5] Interviews lasted from 45 to 60 minutes and followed a topic guide which addressed the possibility of teachers and colleges to exert agency and make choices in curricula design, local labour market adaptation, respond to employer influence and implement formal and informal changes to the curriculum process and the impact of factors such as staff shortages. Individuals and institutions are anonymised in this report to protect the identity of participants.

Each of the FECs which participated in the interviews delivered apprenticeship training in at least two of the three apprenticeships on which the project is focused. To recruit interview participants, members of the research team compiled a database of potential colleges offering the targeted apprenticeship programmes and aiming to maintain geographic diversity. The three colleges all had at least one individual that agreed to participate in an online interview. Each college is described below with an overview of their experience implementing national apprenticeship standards.

Mapping to the Capability Approach: colleges as conversion factors

College A

College A is a FEC offering vocational education including apprenticeships, A-levels (a general education qualification) and T-levels (a mainly school-based VET qualification). It has over 10,000 students. The college has a strong emphasis on career-focused education and has specialised facilities in areas such as construction, engineering, and digital technologies. College A has strong engagement with local employers with many who take on apprentices and offer work experience to students. They have a scheme designed to bridge the gap between employers and the college through regular meetings, giving employers an opportunity to influence curriculum to ensure skills match their needs and recruit from among the student body. Together, this creates important institutional conversion factors that can potentially also enhance the range of option available to learners.

During the summer of 2025, the research team interviewed College A's Director of Curriculum, who coordinates curricula across campuses. Through a wide-ranging discussion about curriculum, flexibility, and funding in Further Education (FE), the research team was able to identify several ways in which the implementation of curricula affects not only skill acquisition but also the development of learners' broader capabilities and their potential for agency.

A certain degree of flexibility in how national curricula standards are implemented was identified in College A. In part this is about the discretionary powers of the teacher in the classroom. As the Director of Curriculum explained, "when a classroom door is closed and the teacher is doing their thing with a set of students, you have relatively little influence and power over what goes on day-to-day" (14:02). Teachers are, in essence, trusted to interpret the curriculum within the agreed framework laid out by the college and the national standards, meeting the student's needs and interests

[5] This project received ethical approval from the University of Warwick's ethical review board, HSSREC. Approval reference number: 208/24-25.

within these boundaries. In that sense teachers with their pedagogical agency influence the realised curriculum and to a certain degree influence learners' capability set formation.

As a contribution to the level of institutional conversion factors, choices are also exercised in response to local employer demand. The college fosters a strong culture of employer engagement, enabling curriculum directors and school leaders to respond effectively to local skill demands and ensure alignment between the intended and implemented curriculum. At College A, employers of higher-level apprentices often expressed a desire for competencies which go beyond that which is in the standard: "employers are quite discerning about the things they want their apprentice to have and sometimes those things [skills] aren't contained within the standard" (23:56). The college will seek to integrate additional skills into the training, where possible, in order to expand learners' options and potential labour market functionings.

While there are pockets of flexibility in curriculum implementation, the case highlighted that there are significant constraints on this flexibility related to external assessment processes and funding pressures which can be regarded as structural conversion factors. As the Director put it, "a lot of the constraint boils down to assessment and the accountability framework" in the English FE system (14:02). The need to prepare students for examinations and evaluations which are administered by third parties means that colleges and instructors have limited capacity to stray from the specified content. "We just obsess over examination in this country" (14:57). The culture of examinations means that the college must prioritise teaching to the test across programmes, leaving less time or incentive for a capability-oriented delivery which in turn narrows learning options and agency of learners.

In the context of apprenticeships, the structure of qualifications plus an EPA can further curtail flexibility. The interview described how when there are embedded qualifications, an apprentice often faces duplicate assessments. The qualification and the EPA "which test the same thing…so it becomes a cottage industry because you're taking 20 per cent of the funding and using it to test what people have already been tested on. Wow" (21:42). Double assessment not only consumes financial resources and absorbs more time from skills instruction which is replaced with test preparation, but it also locks the curriculum into a narrower focus related to passing the assessment, leading to a focus on instrumental functionings rather than capability expansion.

These constraints on curriculum flexibility have important implications for the learner's skill and capability development. One is that an overly proscribed and assessed curriculum leads to a narrow learning experience and a limited set of capabilities accordingly. The interviewee contrasted the English approach – training individuals for specific jobs – with broader scopes seen in countries like Germany: "I think we start with, kind of, a very narrow view of 'we're going to train you for this occupation'. Whereas my experience of Germany…[was] 'we're going to train you to be an engineer, but in doing that, we recognize language, culture, asking questions, teamwork.' All of that stuff is as important as [technical skills]" (33:26). In the Director's opinion, the English system can leave graduates technically proficient on a narrowly defined occupation but without the broader capabilities that employers value and that may help learners over time.

With limited time available, particularly in apprenticeship programmes where learners only spend one day a week at the college, assessment preparation can crowd out deeper learning. The Director described how cycles of exam preparation eat into instruction time as the college ends up “doing a whole set of sessions around, you know, things to prepare people for assessment” (19:40). While this may boost test performance, it deprives learners of an opportunity to engage more fully with the subject matter or leave time for supplemental learning units – which may be requested from employers or learners.

College B

College B offers a variety of courses including apprenticeships, A levels, and T levels. The college has over 10,000 students and has a strong technical and vocational focus. There are multiple campuses affiliated with the college group, including specialised centres catering to training in specific fields such as engineering. It is a large apprentice provider in the region with more than half of their delivery in the Science Technology Engineering and Mathematics (STEM) sectors. College B offers apprenticeship and T level training in the fields of building services (including subject areas such as heating, ventilation and air conditioning), engineering, including manufacturing and industrial tracks, and health and social care.

College B is located within a mayoral combined authority (MCA). Through the devolution of some skills and education authorities from the central UK government to the MCA, local colleges within MCAs have more flexibility in certain areas of their offerings, particularly for adult education. While this does not come to bear on what the college offers in terms of apprenticeships, it does impact what other training provision is available to both employers and learners in the region. The case illustrates how institutional conversion factors can vary between regions and institutions even in one national environment.

The research team was able to conduct an interview with the director and principal of College B responsible for strategic direction of the college and working with local employers and stakeholders to ensure the College is meeting their needs, with a strong focus on workforce development. Through this semi-structured interview, it became clear that again structural conversion factors inhibit options on the level of institutions. Limited funding and external assessments were cited as factors that restricted opportunities for flexibility in apprenticeship delivery.

At College B, there is less flexibility to adapt the nationally prescribed apprenticeship standards than in other VET tracks. As the interview explained, “there’s less flexibility around the delivery of apprenticeships because ultimately they’re being qualified to be an industry specialist…the only flexibility, I think, is where you do your training needs analysis. So if [the apprentice] already got some learning from a previous organisation …you can kind of [shorten] the length of the apprenticeship…but ultimately, they have to demonstrate that they have covered all of the knowledge skills and behaviours within the standard” (2:24). So, while the College B cannot change what skills and competencies are required, it can recognise prior learning providing some possibilities to acknowledging prior functionings and individual endowments within the individual learning process.

The Director of College B explained that there is some flexibility exercised at the strategic level in determining which apprenticeship standards to offer. The college can choose among multiple closely related apprenticeship standards in fields such as construction and engineering, aiming to align offerings with local needs. This process is conducted in consultation with instructors, who often remain closely connected to the industry, local employers and trade bodies.

Similarly, the college can support local employers who have a skills need which does not perfectly align with the available apprenticeship standards. The example discussed during the interview was of a hypothetical employer with commercial plumbing roles but the only available standard is in domestic plumbing. The Director explained that in such instances, the college may attempt to support the apprentice under the closest relevant standard, however such an accommodation is limited by the external assessment process. If the assessment process requires observing an apprentice undertaking a specific task at the worksite and the worksite does not do that task, then there can be a risk of failing the assessment. Even when the college tries to be flexible to match employer needs, rigidities in the assessment process can impede this process. Again, this serves as an example how assessment procedures can impede the development of a wide capability set. Outside of the apprenticeship standards, College B has some freedom to innovate in curriculum delivery, though if there are qualifications involved this may impose limits on innovation. As the Director explained, "there's some flexibility at the surface level [related to choosing modules or projects] but realistically when you're working towards an…awarding organisation's standards and requirements…it kind of stops some of the flexibility because you might want to go, oh that unit would be really good but no, it doesn't meet the rules of combination" (4:53).

Nevertheless, where there is flexibility available outside of the rigidities of awarding bodies and assessments, College B has pursued innovative approaches. For example, they have piloted a level 1 building trades programme that integrates Maths and English learning into vocational tasks. In this pilot, students practice the subjects by drafting emails to hypothetical clients, preparing invoices, and other occupation-specific tasks. Given the opportunity, curriculum flexibility can be used to meet student needs, and the college is willing to engage in innovative practices that lead to an expansion of learners' options and practical functionings. However, this is not possible across all their provision.

Several factors were identified as constraining curricular flexibility at College B. These include standardised qualifications and assessments, funding and the related issues of cohort size and staffing. Rigidities are imposed through the externally managed assessment processes. "We are, as a sector, qualification driven…so that does, perhaps, stunt some flexibility" (3:42). Funding is a significant constraint which impacts the college's staffing and ability to offer programmes. College B, as with others in this study, expressed difficulties related to hiring and retaining qualified teaching staff for certain vocational subjects. In sectors where skilled tradespeople can earn significantly higher wages than what is offered to instructors in FE colleges, this is particularly challenging: "for plumbers and electricians ….because they earn, you know, quite good money on the tools so to come and be a lecturer is…quite a significant pay cut for them" (32:25).

Likewise, funding constraints due to the publicly determined funding bands limit flexibility of which programmes can be offered. During the interview, it was explained that if enrolment is low in a technical programme which is expensive to offer due to the equipment and materials costs, the college cannot deliver the course as it becomes financially unviable. For example, the Director explained “we’ve got five engineering apprentices in our pipeline for September. We can’t run that, it’s too expensive...you’re looking at, really, a minimum of 12 apprentices to start” (43:10). In this case, the college is unable to deliver a programme and may encourage students to enrol in other short courses or training programmes, which counters government aim of more apprenticeship starts.

The apparent lack of flexibility in curriculum implementation at College B has implications for learners’ skill development and capability formation. While on the one hand the standards ensure learners acquire specific competencies that have been deemed essential to the occupation, on the other hand, training becomes confined to what will be assessed potentially leading to a restricted capability set. This can limit the breadth of skills a learner and employer may benefit from on the long term and might also put a constraint on wider capabilities that in turn might lead to later functioning.

College C

College C serves over 20,000 students across multiple campuses. The college offers a variety of curricula which span vocational qualifications, T levels, and apprenticeships. The college has a strong emphasis on employability and industry engagement. The college offers apprenticeships in health care, HVAC-related fields, and industrial engineering.

The research team had the opportunity to interview the individual responsible for curriculum design, planning, and quality at the college. The interview highlighted the limited degree of flexibility which school staff have when implementing apprenticeships, as compared to other programme offerings. Constraints on flexibility were related to the structured nature of the programmes and funding.

Apprenticeships at College C are delivered according to the national standards which prescribe the knowledge, skills, and behaviours expected for entry into an occupation. This offers little flexibility in content or assessment. It was explained “the core content and assessment is very much dictated by the [awarding] organisation” (1:55). They contrasted this with classroom-based courses such as A or T levels which may allow instructors more latitude and include supplementary material, but the apprenticeship was described as “quite rigid” by the interviewee.

The presence of qualifications within an apprenticeship, as is the case with the three occupations focused on in the project, creates even greater restrictions on implementation. As the interviewee explained, “with an apprenticeship...you’ve got to meet the knowledge, skills and behaviours and...some apprenticeships have a qualification in so you’ve got to map the qualification to the knowledge, skills and behaviours and so then obviously you’re more dictated to by the qual[ification]” (3:40).

As such, the structure of the apprenticeship programme — which includes the content that must be taught and the two tiers of assessment, with End Point Assessments sometimes occurring in addition to embedded qualifications — has created limited opportunity (time or resource) to introduce new topics, adjust training to meet learner needs or local employer demand.

Staffing was also highlighted as a challenge, as recruiting qualified instructors is a challenge for College C. It was noted “we have had struggles in some areas recruiting to some subjects in the past, particularly in relation to construction, engineering, maths and English and digital" (4:40). As a result, the college has "had to take people fresh from industry and then train them to be teachers" (4:57), which brings with it additional costs and resource.

One direct consequence of staff shortages is that a high-demand apprenticeship could not be run until an instructor was found. "At the moment we've got one apprenticeship where we're struggling to recruit and we've got a large waiting list...there's big demand for [it but] we just can't" (8:39). In this instance, a large cohort of would-be learners has to wait because the college cannot hire adequate teaching in the subject.

Because of the rigidities within College C's apprenticeship delivery, there are limited opportunities to tailor learning to individualised needs. Heterogeneous endowments among learners - i.e. some students with lower prior attainment - creates additional needs for support. As the interviewee explained, "our learners are coming in with a lot lower levels of attainment from schools" (14:14). The framework of learning, however, means there is less scope to provide customised support beyond the prescribed curriculum.

Despite these challenges, the college is striving to meet the needs of local learners and employers by innovating where possible. Outside of apprenticeships, the college has leveraged flexibility in other programmes to bolster student development. The interviewee described how the college has become "much more flexible" in designing study programmes for full-time students. For example, programmes are being extended over longer durations and tailored to individual learner needs, essentially "designing bespoke study programmes to enable learners to get opportunity to take advantage of their free education...so for us we pride ourselves on being inclusive" (15:04). Accordingly, the potential expansion of options and realised functionings through inclusive practices cannot be fully exhausted due to curricular restrictions within apprenticeships.

Interpretation

This contribution examines the extent to which further education colleges can adapt or modify the nationally set VET curriculum, particularly apprenticeships, to meet local demand and learner needs. Through interviews with leaders at three FECs with provision in the areas of health care support, HVAC, and industrial mechanics, findings reveal significant constraints on curricular flexibility, particularly in the apprenticeship system.

Across the three cases the interdependence of the FE colleges delivery of apprenticeships with external awarding bodies for embedded qualifications and End Point Assessment Organisations, leave little room for flexibility. Flexibility is also constrained by funding structures at the three colleges. High costs associated with delivering technical training, challenges in staff recruitment and retention, and minimum enrolments for viability all influence which courses can be offered, even when there is demonstrable demand. The experience of College C, specifically, suggests that the apprenticeship format is more limited in its ability to flex curricula compared to other offerings — likely due to systemic conversion factors unique to the apprenticeship format.

When viewed through the lens of the CA, these limitations reflect institutional conversion factors – the conditions and structures that affect how resources are transformed into real opportunities for learners. These factors, such as funding and ad interdependence on awarding bodies and EPAOs, are embedded within structural constraints of the broader skills system. Despite these challenges, the educators at these three FE colleges made clear their personal and institutional commitment to developing and supporting learners beyond curricular prescriptions and adopting a capabilities approach to skills development.

Germany: Realised Curriculum, Capabilities and Agency

The German dual VET system according to the Federal Law on Vocational Education and Training (Berufsbildungsgesetz, BBiG) is organised according to the principle of duality, combining company-based learning with school-based instruction. This structure is governed by federal training ordinances (Ausbildungsordnungen) and framework curricula issued by the Standing Conference of the Ministers of Education (KMK). The system's explicit goal is to foster berufliche Handlungsfähigkeit — the ability to act competently and responsibly in occupational contexts. In practice, this means that it is intended that trainees acquire not only technical competences but also social and personal skills relevant for professional autonomy and life-long learning.

The analysis presented here draws on two occupations — Nursing (Pflegefachkraft) and Plumbing/Heating, Ventilation and Air Conditioning (Anlagenmechaniker/in Sänitär, Heizung und Klima(SHK)) — representing two distinct VET sectors. In contrast to the majority of dual training occupations, such as the Anlagenmechaniker SHK, regulated under the BBiG, nursing education in Germany follows a distinct legal and institutional framework. Since the reform of 2020, the Pflegeberufegesetz (PflBG) has established a generalist nursing qualification that integrates the former separate tracks for geriatric, paediatric, and general nursing. The training was previously organised in three separate occupations, each delivered through its own training programme, typically offered at specialised vocational schools (Fachschulen) with extended periods of work-based practice.

Similar to most BBiG occupations which have 3.5 years of training, nursing training lasts three years and combines school-based theoretical instruction (at vocational nursing colleges, Pflegeschulen) with practical training in hospitals, long-term care facilities, and community care settings. The curriculum is competence-oriented and guided by the objective of enabling learners to provide person-centred, evidence-based, and ethically grounded care across all age groups and care settings (see §5 PflBG). While it shares structural similarities with the dual system — particularly the alternation between theory and practice — the nursing pathway differs in its funding mechanisms and governance. The programme is regulated federally but implemented mainly by the Länder (state). Practical training providers must develop training plans and cooperate closely with the schools (see §7,8,9 PflBG). In line with these different institutional foundations, there are also differences in the implementation and execution of the curriculum, which can be expected to have an impact on capability-related aspects of learning in the two vocational contexts.

Method: interviews with teachers and learners

The findings are based on qualitative "problem-centred" interviews (Witzel, 1989) conducted with one teacher and two learners in vocational schools offering the respective two occupational programmes. The SHK study included two apprentices and one vocational teacher from a vocational school; the nursing case comprised several learners and teaching staff from a health college. Teachers were asked to select learners who represented a broad spectrum in terms of characteristics such as entry qualifications, performance level, year of training and other characteristics that could influence the development of capabilities.

Semi-structured interview guides were derived based on categories from the Capability Approach such as endowments, conversion factors, options, capabilities, functionings, and agency values.

The interviews were recorded, transcribed, and analysed using qualitative content analysis (Mayring, 2019) with a deductively developed coding scheme.

Table 2 provides an example of the coding guide used in this study, showing the concept drawn from the CA, instructions for the coder, and anchor examples illustrating the application of the code. With this procedure relatively high intercoder reliability for each of the codes was reached between two coders (between 0.8 and 0.95).

Table 2: Examples from the coding guide

CA Concept	Questions and statements	Coding Rule	Anchor Examples
Options (Options & Access)	Inquired about experienced options in the education system and labour market, e.g. access to further education programmes, training alternatives, professional mobility etc. Statements about specific educational paths, perceived choices, barriers or opportunities in accessing training, education and employment.	Learners speak about existing alternatives, pathways, barriers or support structures in the education system or in career choices.	"My A-levels were sufficient for that, it wasn't a problem at all. [...] But then I thought to myself, you study law, you're wasting your time somewhere [...]" "I had a call, [...] they then decided in my favour, so it wasn't that difficult for me."
Capabilities	Indicators of self-determination, adaptability, critical thinking, creativity, social participation, resilience. Recorded through self-reports, observation or competencies Statements about the actual possibility of developing and implementing individual goals, interests or skills in education or work	It is clear that learners (can) make practical use of their scope for action or are prevented from doing so, e.g. by structures, self-confidence or resources.	"When you're an apprentice and you do things on your own or just come up with ideas independently and help the journeymen, you feel kind of proud of yourself." "I laid a drain pipe myself, three floors up."
Functionings (opportunities for action in everyday life)	Documentation of actual activities and routines in everyday training and professional life (Alkire, 2005). Descriptions of specific actions, lived practices of typical processes, tasks, routines and experiences during school-based and practical training in the workplace.	Learners talk about their specific everyday lives, describing activities, structures or routines in the workplace without primarily emphasising skills or emotions.	"It's always the case that you arrive first, you write down the hours first [...], then you go somewhere with the journeyman [...]." "Maintenance work on facilities. [...] Drinking water pipes, drains replaced [...] Building blocks completed.

Mapping to the Capability Approach: learners' experiences of VET, development of broader capabilities beyond employability?

Across both occupations, learners described their training as a formative experience that allowed them to gain technical expertise, confidence and independence. Teachers emphasised that successful training depends on the interplay between personal motivation, workplace learning culture, and institutional support. While both occupations are governed by standardised training regulations, the realised curriculum — what learners actually experience — varies substantially across companies, schools and across occupations.

Especially in nursing, learners reported a growing sense of social responsibility and empathy as integral to their professional development, whereas in SHK, practical problem-solving and customer interaction emerged as key domains for autonomy and agency: "Yes, definitely. I've realised that you really need empathy, and I've noticed that it works for me too. You have to respond to people in the right way, and you also need a fair amount of knowledge and so on. Yes, it works." (Nursing Student)[6]

When it comes to the SHK occupation, motivation and goals connected to the chosen occupational pathway are more instrumental, as the following quote illustrates: "One of my dreams, I would say, was to study law. I was also close to studying law. My A-levels were good enough for that, so that wasn't a problem. But then I thought to myself, if you study law, you're wasting your time, so to speak, because you only earn a little money on the side, whereas in the trade you can definitely earn a lot more money, even during your training. You get practical experience and theory. So both made sense to me. That's why I chose this path. I chose this path, and that was that." (SHK Apprentice).

Both groups described growing confidence in their ability to take responsibility and make independent decisions. In SHK, autonomy developed through troubleshooting and on-site decision-making, in Nursing, through relational work and ethical judgement. However, learners also noted constraints: heavy workloads and hierarchical structures sometimes reduced their ability to influence learning processes. Teachers saw their role as mediators, supporting reflection and adaptability as core capabilities rather than mere skill acquisition.

In the following descriptive analyses, we present findings along some core concepts of the CA that were addressed through the interviews and contextualise and compare them across occupations.

Conversion factors: company training structures, cooperation school–firm, regulatory framework

The interviews in nursing highlight that the new generalist nursing training provides good practical preparation and support from instructors and mentors, though workplace hierarchies sometimes limit learners' autonomy. Learners experience strong social and family support, and value positive class climates and inclusive school cultures. However, time pressure, staff shortages, and differences between school and workplace practices restrict opportunities for deeper learning and independent decision-making. The teacher describes highly heterogeneous learner groups with diverse backgrounds, strong institutional support structures, and efforts to personalise learning through mentoring and additional tutoring. Overall, the programme can foster professional identity and cooperation but faces systemic challenges such as under-staffing, high workloads, and limited flexibility in curriculum implementation. This finding is especially interesting given the increased focus on new pedagogies within the field due to the recent reform of the nursing education system. Among the various themes discussed, this topic emerged most prominently in the nursing interviews.

The interviews with learners and the teacher in the SHK-apprenticeship training programme show overall positive learning and working environments. Learners describe supportive relationships with teachers, trainers, and peers, contributing to motivation and confidence. They appreciate

[6] Translations were carried out with help of the AI-based translation tool DEEPL and checked and corrected by the authors.

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practical learning opportunities and individual help, for instance through vocational training centres or supportive colleagues. Family encouragement and collaboration with peers in their vocational school class further strengthen their learning experience. Minor challenges such as stress at work or differences in teaching styles occur, but respect and mutual support between teachers and students remain central features of the programme. However, the teacher raised concerns about the quality and quantity of interactions with the firms providing work-based training, that sometimes according to him do not show sufficient interest in cooperation with the school.

Options and choice: range of tasks and learning opportunities in training

The interviews show that learners in the new generalist nursing programme appreciate the wide range of experiences it offers across care settings such as hospitals, elderly care, psychiatry, and paediatrics. This diversity helps them identify their professional interests and provides a broad foundation for future specialization. However, some students perceive the generalist design as a disadvantage if they already have a clear career goal, as the training can feel too fragmented and not deep enough in one field. The learners also highlight the accessibility of the profession and its openness to people of different ages and backgrounds, reflecting strong inclusivity in nursing education. The teacher notes that, despite formal options for specialization, contractual obligations with training providers often limit real choice, constraining learners' autonomy in shaping their professional pathways: "So the fact that, in general terms, it is said that at the present time you can choose between paediatric nursing and geriatric nursing is, in my opinion, actually a stumbling block. The moment the trainees sign their employment contract, their training contract with the provider, they are actually already saying in advance where the specialisation will take place, because it has to be with the provider." (Teacher Nursing)

Interviews also illustrate diverse educational backgrounds and aspirations among learners in the SHK field. Both interviewees initially aimed for academic careers, such as studying law or engineering, but turned to vocational training after facing practical or academic barriers, highlighting the formal permeability of apprenticeships according to BBiG. Entry into apprenticeships was not always easy, with one of the learners describing extensive efforts during the COVID-19 pandemic to secure an apprenticeship position. "So I wanted to go into construction, as an engineer, and I wanted to study that, so that I could design buildings myself and see them being built. But as I said, it didn't work out with my grades, there was just too much going on and everything. That's why I thought it would be better to do my apprenticeship." I_2: "Was it easy for you to find the job?", "Not really, because it took me almost two years to find a job, because it was during the coronavirus pandemic and I remember sending almost 160 applications online, as well as many by post, before." (Interview with SHK Apprentice).

Teachers emphasise the heterogeneity of the student body, ranging from those without school-leaving certificates to university graduates, and stress the importance of fair and individualised assessment. Overall, the findings show that VET offers the possibility to accommodate diverse learner profiles. Learners in both sectors valued the diversity of tasks and practical engagement but differed in their perceived scope of learning. Nursing students experienced structured rotations across wards, allowing them to explore varied professional fields and develop reflection skills. SHK apprentices often faced narrower task profiles, yet some described situations where problem-solving and innovation expanded their range of options. Teachers identified the balance between standardisation and flexibility as crucial for ensuring meaningful learning experiences for the students.

Functionings: concrete competences and responsibility

The nursing trainees describe a wide range of practical tasks, from basic care and documentation to medication preparation and patient interaction, reflecting strong hands-on learning. They report that learning new tasks often involves observation, guided repetition, and gradual trust-building with supervisors, showing a clear process of skill acquisition and growing autonomy. Differences between school-based and workplace instruction require adaptability, as procedures vary across institutions and learners must reconcile theory with practice. The interviews also reveal that trainees are entrusted with responsibility when they demonstrate competence. This might foster confidence and professional identity. Overall, the accounts illustrate how learners develop capabilities such as responsibility, judgment, and self-directed learning within the structured yet practice-oriented training environment that they ultimately can transfer to their everyday professional tasks.

The interviews with SHK apprentices and their instructor reveal a work-based learning environment shaped by routine tasks, gradual responsibility, and strong practical engagement. The two learners describe diverse and evolving activities — from maintenance and installation to customer-oriented adaptations — which foster technical competence and pride in their achievements. They report increasing autonomy, as they take responsibility for tools, materials, and independent assignments under supervision. However, the SHK apprentices describe limited opportunities to influence training content or decision-making, though they can contribute ideas and take initiative in practical work situations. “Yes, I can do that, I can do that. Have a say, yes, probably a little bit, but like, have a say now, what do I know, have a say. As apprentices, less so, but giving ideas, 100 per cent, yes.” (SHK Apprentice)

Learners express pride when given responsibility and when their independent work is recognised by trainers or supervisors, indicating growing confidence and competence. Their learning strategies combine self-reliance (“freestyle” – according to one apprentice) with active help-seeking from mentors. “ Yes, there was a job like that. We were in a basement and had to lay a water pipe there, and the journeyman I was supposed to be working with was off sick the next day, or rather, he had an injury. So he briefly explained to me what we had to do when I was there with the other journeyman. So I had more responsibility than the journeyman, because I knew exactly how to do it, but he just had to do what I told him. And yes, that was it. But otherwise, it was always like that.” (SHK Apprentice)

Teachers confirm that the curriculum offers little structural flexibility but emphasise the importance of professional identification and intrinsic motivation for successful learning.

According to the teacher experiences differ across training firms: while small companies often provide broad learning and mentorship, large construction sites may limit learning to repetitive labour. The teacher highlights his dual role as educator and social supporter in a heterogeneous learner group, balancing individual encouragement with maintaining standards of occupational competence. Overall, the findings illustrate how capabilities such as responsibility, adaptability, and self-efficacy develop within the constraints of workplace realities.

Agency Values: learners' and teachers' aspirations beyond labour market outcomes

The interviews show that learners in nursing view their profession as meaningful and socially valuable, closely linked to helping others and building relationships with patients. Both learners emphasise intrinsic motivation, emotional engagement, and professional growth rather than hierarchical advancement or administrative careers. Success is defined through satisfaction, teamwork, and the ability to continue learning and supporting others, reflecting strong internalised professional values. Teachers share this view, describing care work as a privileged and valued profession that requires perseverance and emotional resilience. Overall, the findings highlight the development of agency, commitment, and value orientation—core capabilities that extend beyond employability toward a broader sense of purpose and contribution.

In the SHK sector, trainees express more moderate expectations beyond fulfilling their professional duties and earning an income. When the conversation turns to social activities, one of the trainees replies that he has not had time for social engagement since starting his training. When discussing the attractiveness of the SHK profession with the teacher, the teacher expresses scepticism about the trainees' intrinsic interest in the profession, e.g. being able to contribute to the fight against climate change. This is rather the exception; on the contrary, there are also many 'climate deniers' among his trainees.

Interpretation

The German cases illustrate how the realised curriculum embodies the interaction of structural and individual dimensions. Conversion factors at company and institutional level shape learners' options, while individual agency transforms these into capabilities and functionings.

The German case study reveals that the differences between the nursing and SHK training programmes are smaller than might be expected, despite their distinct legal and institutional frameworks. Across both cases, similar challenges were identified — in the implementation of training, the coordination between school-based and workplace learning, and the structural limitations set by the dominance of the training company in shaping the learning experience. In both fields, teaching practice was described as integrative, aiming to respond to learners' highly diverse backgrounds and learning needs.

A notable distinction, however, lies in the perceived purpose of education. In the nursing case, learners often referred to the non-instrumental dimensions of learning – such as care, empathy, and the intrinsic value of helping others – which resonates with the Capability Approach's emphasis on education as a space for personal growth and meaningful human development. By contrast, the HVAC learners' accounts remained largely within the realm of instrumental functionings, focusing on task performance, employability, and the acquisition of job-relevant technical skills.

Discussion, Conclusions and Outlook

The three case studies presented in this report each illuminate different aspects of the Capability Approach as applied to vocational education and training (VET). It was shown how the themes of the CA were addressed in different sub-projects of the Skills2Capabilities project.

While they vary in scope, institutional setting, and analytical depth, all cases contribute to our understanding of how VET systems enable or constrain the development of learners' capabilities. Each case was linked to the CA to a different extent: the German study (nursing and SHK) placed particular emphasis on the micro-level of learners' experiences and the interplay between institutional conversion factors and agency; the Dutch study focused on system-level curriculum reforms and their measurable effects on learners' opportunities and outcomes; and the English study examined the organisational and regulatory conditions that shape the degree of flexibility and freedom in curriculum implementation.

Taken together, these approaches allow a comparative perspective on how intended, implemented, and realised curricula can be mapped to the key categories of the Capability Approach – from structural options and conversion factors to the capabilities and functionings that learners actually achieve. Despite their methodological differences, the three cases provide complementary insights into major aspects of the CA applied to vocational education and training systems.

Effects of curriculum changes, and how does the curriculum influence teaching and learning in VET?

The Dutch study, based on a robust quantitative design, draws on a uniquely comprehensive data infrastructure that allows for a tracking of curriculum updates across the MBO system over time. This solid empirical foundation lends considerable credibility to its findings. In particular, the study highlights the positive effects of curriculum renewal on employment and wage outcomes. The effects of an increase in social skills, for example could be interpreted, from a Capability Approach perspective, as indicators of enhanced capabilities – signalling not only improved labour-market performance but also an expanded set of opportunities for meaningful social participation and collaboration at work.

The English and German case studies, while qualitative in nature and thus more limited in terms of generalisability, reveal converging themes that reinforce and enrich the quantitative findings from the Netherlands. Both demonstrate how institutional and regulatory contexts shape teachers' and learners' room for manoeuvre – their practical freedoms – in transforming curriculum intentions into realised capabilities. Across both the English Further Education colleges and the German dual-system contexts, similar constraints were observed: while strong external assessment regimes, and funding pressures are mentioned especially in the English context, the dominant influence of the workplace on learning content and pacing is stressed in both cases. The German case also demonstrates that sometimes the curricular aspirations in regard to achieving capabilities do not meet with the actual needs or demands of the learners.

Together, the three cases provide a multi-layered picture of how system-level options, institutional conversion factors, and individual agency interact in shaping the outcomes of VET. Quantitative evidence from the Netherlands underpins the significance of broader skill dimensions – especially social and systems skills – while the qualitative evidence from England and Germany demonstrates how such capabilities are realised, constrained, or sustained in everyday educational practice.

How can the categories of the CA be applied to the analysis of VET and, in particular, to VET curricula?

The findings from the three national case studies show that the results of curriculum research in vocational education and training (VET) can be meaningfully interpreted within the framework of the Capability Approach (CA). The CA can provide a conceptual structure that helps to link empirical observations about curriculum design, implementation, and learning outcomes with a broader understanding of how educational systems expand or constrain people's real freedoms to learn and to act.

Across the cases, the categories of the CA align well with key dimensions of curriculum research. The intended curriculum — as reflected in national standards, qualification and assessment frameworks, and curriculum reforms— corresponds to the level of options formally made available to learners and institutions. These options define potential learning trajectories and signal what kinds of professional and personal development are envisioned. The implemented curriculum, as observed in schools, colleges, and training companies, can be understood through the lens of conversion factors that determine how these formal options are transformed into real learning opportunities. These factors include pedagogical practices, cooperation between schools and firms, assessment regimes, and funding mechanisms. Finally, the realised curriculum connects most directly to capabilities and functionings, capturing how learners exercise agency, develop professional identity, and acquire the capacity to adapt to new circumstances.

The empirical results fit naturally into this analytical scheme. In the Dutch case, curriculum updates expanded learners' options and resulted in measurable improvements in employment and wage outcomes, while the observed impact of social skills can be interpreted as an indicator of enhanced capabilities — broader and more transferable freedoms to participate meaningfully in work and society. In the English and German cases, qualitative evidence illustrated how conversion factors such as assessment regimes, funding structures, and cooperation between learning sites shape the realisation of these capabilities.

Thus, the CA framework allows the diverse empirical findings — from quantitative system-level evidence to qualitative accounts of practice — to be integrated into a coherent and widely accepted model. It helps to understand curricula not only as technical instruments for skill transmission but as enabling structures that open (or limit) real opportunities for learning, development, and participation. It thereby offers a framework for connecting curriculum research to questions of justice, inclusion, and human development in vocational education and training.

What are the benefits more generally of using the CA approach to analyse VET?

More generally, the Capability Approach (CA) offers a valuable yet also demanding framework for analysing vocational education and training (VET). Its main benefit lies in its ability to connect systemic, institutional, and individual dimensions of learning within a single conceptual model. By focusing on *what people are effectively able to do and to be*, the CA encourages researchers and policymakers to look beyond employability metrics and assess how educational systems provide and expand real freedoms and opportunities. This perspective opens up a richer understanding of VET as a human development process, not merely an economic one, as it is often postulated.

At the same time, this working paper highlights that the added value of such an ambitious framework must be carefully weighed against its complexity. The Dutch study, with its robust empirical design and clear labour market indicators, demonstrates that insights into curriculum effectiveness can be achieved without adopting the full conceptual architecture of the CA. However, the CA provides an interpretive depth that purely outcome-oriented analyses cannot reach—it situates employment, wages, and skills within a broader context of individual agency, participation, and well-being.

Still, questions remain about the scope and priority of its elements. Income and stable employment are not rejected within the CA but must be recognised as essential preconditions for broader capabilities. Without material security, other freedoms — such as the capacity to choose meaningful work or to engage in lifelong learning — could remain largely theoretical. The challenge would then be not to replace economic indicators but to interpret them within a wider human-centred evaluative space.

Another issue concerns the openness and generality of the CA. While this flexibility allows it to be applied across disciplines and policy contexts, it can make it difficult to operationalise in the advanced and empirically grounded discourse of VET research. The CA's multi-level structure and its emphasis on subjective dimensions of well-being and agency pose substantial methodological demands. They require combining system-level data with individual-level narratives and integrating quantitative and qualitative evidence—a task that few studies are yet equipped to meet fully.

Nevertheless, this report shows that the CA can act as a *connective framework*—not as a competing theory, but as a meta-level perspective that helps to interpret diverse findings and link them to questions of equity, meaning, and personal development in VET. It does not replace existing theoretical traditions but provides a broader evaluative space within which they can be meaningfully combined. The present analysis has shown how CA and curriculum research can be matched.

The CA can likewise be fruitfully connected to other perspectives. Political-economic approaches allow for analysing how institutional arrangements and governance models shape the distribution of opportunities and conversion factors at the system level. Recognition theory, on the other hand, complements the CA when exploring how vocational and workplace identities are formed, valued, and sustained—linking capabilities to the social foundations of esteem and belonging in work.

Such combinations underscore the potential of the CA not as a closed theory but as an open, connecting framework that could enrich the established body of VET research. By integrating structural, institutional, and personal dimensions, it helps to understand vocational education as both an economic and a human project — aimed at expanding the real freedoms of individuals to lead meaningful, self-directed and socially recognised working lives.

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Appendix

Table 3: CA Categories addressed in the qualitative studies in England and Germany

CA Category	England (Implemented Curriculum – 3 occupations: Care, HVAC, Industrial Mechanic)	Germany (Realised Curriculum – Nursing, SHK)
Endowments (individual, household, community resources)	Likely background of learners captured indirectly via teachers' views; institutional resources of colleges, funding	Some learner characteristics from interviews; workplace and household context emerged in narratives
Conversion Factors (personal, social, political, economic, natural)	Institutional arrangements of colleges; regional labour market contexts; teaching practices as mediating factors	Training company structures; school-company cooperation; regulatory framework (dual system); social/individual constraints
Options (available opportunities)	Perceived curriculum scope: how intended content is translated into options for learners in practice, assessment practices	Training tasks offered in companies/schools; range of learning opportunities made available to apprentices
Capabilities (freedoms to achieve)	Teachers' assessments of whether curricula open space for learning choices; gaps between formal intentions and practical possibilities	Learners' reflections on whether they can/want develop broader freedoms (agency, critical thinking, adaptability) beyond employability
Functionings (achieved outcomes)	Observable student competences in practice; how teachers evaluate actual outcomes of implementation	Learners' achieved skills and wider outcomes in everyday work; concrete experiences of autonomy, responsibility, professional growth
Agency Values (what individuals value and choose)	Teachers' and decision-makers' normative views on the purpose of VET (preparation for labour market vs. broader goals)	Learners' and teachers' perspectives on what is valuable in training and life; aspirations beyond immediate employment

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