

# Typologies in Comparative Vocational Education: Existing Models and a New Approach

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**Abstract** The ways in which vocational education and training (VET) systems are structured vary significantly from country to country, both because different countries have different objectives for their VET systems and because VET is differently embedded within the education and labour market systems of any individual country. International research in this area makes use of a range of existing typologies to characterise and compare VET systems. However, many of these typologies have weaknesses, for example in relation to the consistency of their descriptive criteria or the extent to which the typology is able to tackle more complex VET systems. This paper therefore takes a multi-perspective approach to developing a new typology that builds on existing approaches from a range of disciplines, justifies a specific combination of these approaches, and substantially expands on them. Specifically, it combines a skill formation approach with both a stratification approach and a standardisation approach. It also explicitly acknowledges the practice of learning as a criterion. This new typology enables VET systems in a range of countries to be categorised systematically across the different levels involved, including in relation to aspects as varied as government regulation, curriculum design, and teaching practices. This will be illustrated using six countries – China, France, Germany, India, Japan and the USA – as case studies. These case studies demonstrate substantial differences but also partial convergences between these countries. The typology offers both a framework for further explanatory approaches in individual country contexts and an opportunity for international comparison of key aspects of VET systems, such as the value attached to vocational qualifications and the possible transfer of VET models from one country to another.

**Keywords** Comparative vocational education · VET systems · Typologies · Skill formation systems · Standardisation and stratification · Practice of learning · China · India · Japan · USA · Germany · France

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## Introduction

Unlike general education, which usually has a clear structure, the sheer diversity of vocational education and training (VET) systems tends to produce a lack of clarity, and sometimes even confusion, when observers attempt to make international comparisons (Greinert 2002). The structured categorisation of VET systems according to typologies and drawing on the research discipline of comparative vocational education is one way to tackle this problem (Lauterbach and Mitter 1998). Typologies are commonly used in this discipline (Deißinger 1995, p. 377; Gonon 2013) and are more or less ‘ideal type’ constructs in which ‘ideal types’ diverge from empirically identified ‘real types’ (Deißinger 1995, pp. 369–377).

The development and use of typologies in research into comparative vocational education is not uncontroversial (Grollmann 2009, p. 253). For example, Lauterbach (2003, p. 527) is sobering in his fundamental challenge to their relevance: “In comparative business education, the period between the 1970s and 1990s was dominated by ideographically oriented studies of foreign VET systems based not on solid comparative analysis but on the construction of artefacts to systematise such systems in line with typology theories.” Our aim here, however, is to counter this criticism on the grounds that typologies have the capacity to offer initial systematic access to a particular VET system and to broaden understanding of that system within its own social, labour market and general educational context. An international comparison also enables differing structures and characteristics to be teased out systematically (see below).

In this paper, we shall outline and critique a range of existing typologies applied to international vocational education and training. We shall then use this critique to develop and present a new approach to designing a typology that – by contrast with the currently dominant approaches – offers a broader but still structured approach to the diverse characteristics of VET systems across differing countries. The approach will then be illustrated by categorising the VET systems of six countries.

## Examples of VET Typologies

The international literature on systematising VET systems reveals a wide range of approaches. Gonon (2013, p. 4) presents an overview of six approaches to demonstrate how “core elements of different systems [can be used] in order to gain a typology”. This approach illustrates how differing systems – and differing typologies – may have very different focuses. To provide an overview, we present below and reflectively critique a small number of selected typologies to represent as wide a coverage as possible of the discourse around this area.

Traditionally, European research into country hierarchies according to type of training system has produced a typology shaped particularly by the influence the state exerts on vocational training (Green 1995; Greinert 1988). The approach distinguishes between the “school model”, the “market model” and the “state-regulated market model”. In the “school model”, the state takes responsibility for initial vocational training, which is provided by the state education system. Greinert (1988) cites France as a practical example of this ideal type: in France, large sections of initial vocational training take place in vocational schools in full-time study mode.

In the “market model”, by contrast, vocational training is largely organised without state influence: companies provide training services wholly on their own initiative. It is clear that this model centres on the practical way in which skills are passed on – that is, on a marked orientation of skill development to the specific requirements of individual companies – with particular importance attached to strict efficiency criteria. The most commonly cited practical example of this ideal type in the research literature is that of the United Kingdom, where the aims specified by the state for vocational training exist in what might be called ‘niches’ (see, for example, Green 1995; Ryan 2003) but where companies carry out the actual training, often informally and without any form of certification.

The third model is the “state-regulated market model”, in which the state manages companies’ involvement in training. In this model, the state defines a statutory framework (including, for example, guarantees of the breadth and complexity of training) irrespective of the specific requirements of the individual training company. However, the powers to provide training are devolved to companies, including the freedom to decide whether to take on apprentices and if so, how many and subject to what entry requirements. This model involves the separation of general education from vocational education. The classic example of this ideal type is Germany, whose ‘dual’ training system offers a balance between the needs and interests of companies on the one hand and the state on the other (see, for example, Greinert 2007).

Although popular, this typology has been open to criticism from the discipline (Grollmann 2009, p. 254), and it is appropriate to give at least an overview of that criticism here. Deißinger (1995, p. 374), for example, notes that “The question arises as to whether this typology is fruitful as we have defined it – that is, whether it allows us to identify the way in which institutionalised vocational training operates and is structured and the context in which it functions and, hence, the constituent features and core parameters of a ‘vocational training system; we must also question whether it meets the quality criteria for typological constructs – that is, whether it generates ideal types as defined by Weber.” In structural terms, Deißinger (1995, pp. 374–377) criticises the use of a single criterion as being too narrow to typify an entire VET system, while in content terms, he criticises the fact that key parts of a VET model that do not easily fit into the typology are simply excluded (for example, college training in the USA). Deißinger is also critical of the logic, pointing to difficulties with the nomenclature; this schema, he argues, refers sometimes to functions (the “market model”), on other occasions to providers and functions (the “state-regulated market model”), and on yet other occasions to locations (the “school model”), thus failing to define an unambiguously rigorous criterion.

The OECD categorisation, which is tailored to transition contexts and processes (2000, pp. 31–32), takes an approach that is relatively close to Greinert’s. The OECD distinguishes between “apprenticeship countries” (in which more than 50 % of young people complete an apprenticeship), “mixed pathway countries” (in which between 20 % and 50 % complete an apprenticeship), “school-based vocational countries” (in which more than 50 % follow vocational training programmes but 20 % or less complete an apprenticeship) and “general education countries” (in which more than 50 % receive vocational education and training through their general education). Although this approach follows Greinert’s in focussing on the combination of learning locations, its innovation lies in the fact that, by quantifying take-up rates, it can be compared with general education. The inclusion of data relating to volume through

information about participation rates therefore meets one key demand for a typology – that it highlights the relative importance of a focussed VET programme. Its exclusive focus on transition means, however, that this approach is able to account for only minor aspects of vocational education and training.

Niemeyer (2007) has also devised a typology tailored to transition processes, but her typology focuses specifically on disadvantaged young people from a European perspective. Niemeyer (2007, pp. 127-128) also draws on Greinert's model but expands it by including specific issues related to the transition processes of disadvantaged young people (historical vocational education theory, comparative welfare state research, and youth research) to produce a construct based on four models of European transitional systems and defined using a total of nine criteria (Niemeyer 2007, p. 126). These criteria include, for example, the nature of a country's welfare system, the structure of its VET system (with the same three categories used by Greinert plus an additional category, "highly informal"), weak points or challenges, and social perceptions of youth unemployment.

This approach may be seen as very specific to our subject matter, although, from the perspective of the sheer number of criteria derived from different domains, it may also be seen as very broad. However, its particular origin – an EU research project – should be borne in mind: as Niemeyer (2007, p. 127) argues, "Typologies always run the risk of over-generalization if they are not based on theoretical considerations, a well-founded selection of criteria and extensive analysis. It should therefore be emphasized once again that the summary (...) should be seen as an instrument for the (self-)understanding process within transnational research projects."

In relation to relevant existing research, Crouch et al. (1999, pp. 24-25) distinguish between differing types of capitalism, using the ways in which institutional forms are combined to distinguish between skill development provision across countries. This approach, too, therefore relates to a very narrow field of VET and is inadequate for our purposes, as it is not able accurately to portray the breadth and complexity of a VET system as whole. However, the approach does make an explicit distinction between "initial VET" and "further VET", treating the latter as a discrete sub-area and making it possible to illustrate differences between the two sub-areas. The authors identify a total of five dimensions to underpin their classification: direct state; corporatist networks; local firm networks; institutional companies; and free markets (Crouch et al. 1999, p. 25). Unlike other classification systems, this system often allocates an individual country to more than one dimension. Because the dimensions are not mutually exclusive, a country may fit with more than one, something that this approach makes explicit. For example, Sweden and the UK feature on three dimensions, though the addition of parentheses indicates that a particular dimension represents a minor model within the country in question.

A further approach was devised by Steedman (2012) for the ILO.<sup>1</sup> This approach differentiates between individual approaches to apprenticeships rather than between VET systems as a whole. Steedman (2012, p. 3) distinguishes between a (traditional) apprenticeship, a traineeship, an internship, an informal apprenticeship and workplace

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<sup>1</sup> Ryan (2000) takes a very similar approach in using the characteristics of apprenticeships. However, his approach develops very specific characteristics that focus on formal and statutory aspects (such as legal status, stakeholder involvement, duration of training, certification, etc.) and is used to categorise six European countries.

learning, using a total of nine criteria to reach these distinctions, including wages, legislative framework, formal assessment, certification, and duration of training. The paper goes on to categorise individual G20 countries on the basis of these criteria. This approach is very helpful in describing and categorising the wide range of practical approaches to apprenticeship in operation around the world. However, alongside the fact that it is restricted to apprenticeships, a further weakness of this approach is that it is not transparent how the criteria have been derived nor is the process informed by theory: it remains unclear why certain criteria have been chosen, and there is no explanation of the differing dimensions or of the differing levels of abstraction evident in them.

A further well-known approach is that of Rauner and Wittig (2009), which correlates two dimensions with two features in a single relationship. First, they define a mode of control and influence in terms of the extent to which the various VET stakeholders have been consulted on, and agree with, the system. This level may be high, in which case the authors describe the system as “coordinated”, or it may be low, in which case they describe the system as “fragmented”. Second, they identify a mode of control and influence in relation to control of inputs or control of outputs. As a result, there are four possible combinations, which may be illustrated as a matrix (Rauner and Wittig 2009, pp. 28–31). The authors began by allocating a total of seven categories to the two dimensions, then sub-dividing these into sub-categories. Experts then used a point scale to assess the categories for individual countries. This process enabled countries to be placed within a four-field matrix (Rauner and Wittig 2009, pp. 38 and 46). This approach may be seen as very elaborate, because many different criteria are used to obtain an accurate ranking. It also shows, however, that accurately characterising a VET system requires a high number of criteria and, hence, a detailed procedure. Against this backdrop, it is understandable that in this approach, the sole focus is the control and influence exerted by stakeholders and that other aspects are not taken into consideration.

These few examples alone show that concretely designing and applying typologies is a challenge. Other problems of a general nature also arise, which are not confined to any single typology. Frommberger and Reinisch (1999, pp. 340–343) in particular, writing in the context of German comparative research, have noted that typologies of vocational training systems frequently fail to acknowledge the complexity of such systems and the extent to which they are an integral part of a country’s general education system, employment environment, and social system.

Deißinger (1995, p. 372) also argues that

*The literature shows design defects: either contributions focus on a single structural feature as the criterion for comparison, ignoring other features of such systems that reflect the complexity of training activity and the context in which it takes place, or they exclude the criteria that are relevant to a contemporary approach to comparison, focusing also on the employment education implications of current issues in both practice and policy. There are also references to typologies that create an impression of arbitrariness because they are clearly not based on design principles informed by criteria but rather use clusters of characteristics to produce descriptively compressed abstractions, producing ‘system variants’ rather than rigorously constructed ideal types.*

## A New Approach: a Multi-Perspective VET Typology

We shall now present and explain our own approach. Our aim is to be critically but constructively eclectic in using the strengths of existing typologies, minimising their weaknesses, and constructively enhancing and expanding the typologies. Our intention is to develop an analytical approach that is as comprehensive as possible, does substantially more than simply describing individual system elements and, for example, takes account also of interaction between VET, the general education system, the labour market and the views of society. We also, however, intend to produce a structure with process character that avoids the risk of an excessively detailed and uncoordinated analysis (see also Section 5, Perspectives).

The approach described here focuses on VET processes in the broadest sense so that it can subsequently be used to categorise as many forms as possible of existing real VET activities in widely differing countries. The primary focus is on initial vocational education and training, which enables us also to take account of non-formal and informal training processes. Our aim is also to account for training activities right along the process chain. As a result, we focus not only on inputs but also on the process itself and on outputs – outcomes in the broader sense.

We intend to do this at all three levels of VET activity – the micro-, meso- and macro-levels. Existing comparative research into vocational education and training has focused particularly on the macro-level of training systems (Grollmann 2009, p. 255). Niemeyer (2007, p. 123) warns that “What is lacking, however, is the link between macro- and micro-levels and research into the interdependence of the two levels, particularly from the transnational perspective.” Consequently, this approach is innovative because it integrates all three levels. In other words, elements of the typology are generated not only at the macro-level of a VET system – at the level of stakeholders and funding – but also at the meso-level, including elements such as the curriculum, the nature of the institutions involved, certification, and the teaching staff (Gonon 2008, pp. 97–102). Moreover – and this is something that is almost entirely absent in existing typologies (Niemeyer 2007; Grollmann 2009, p. 255) – our approach aims specifically to analyse the micro-level, the level of concrete teaching and learning. This is important because it is ultimately at this level that the product of any educational process is developed. This level therefore requires particular attention. The distinction between micro-, meso- and macro-levels supports the structured analysis and comparison of the real characteristics of vocational training in an international context (Lauterbach and Mitter 1998, p. 237; Gonon 2008, pp. 97–102). At the same time, however, it is important to avoid using this ideal type distinction dogmatically. All three levels usually interact and are interdependent. For example, legislation on vocational schools at macro-level sets clear responsibilities for curriculum development. Specific curriculum design falls within the meso-level, whereas concrete implementation occurs at the micro-level. To that extent, the categorisation of analytical models at one of these three levels also makes use of ideal types and is intended to illustrate the central focus (see below).

Here, we would again emphasise that developing a typology requires a system to be described in idealised terms. This has two implications. First, it is a characteristic of ideal types that not all ideal types actually correspond to real types – that is, it may not always be possible to match a country and its actual VET system with a particular ideal type. Second, there is a question mark over the ‘reach’ of any typology. As noted



above, any typology reflects only the standard way in which a VET system operates. It cannot accommodate unusual or special cases, such as full-time, school-based vocational education in Germany (Hippach-Schneider et al. 2007) or company internships in Japan (Ito 2012). Nevertheless, when a real type is included in a typology, it is important that the extent to which it relates to the VET system as a whole is explicitly spelled out (Pilz 2002, pp. 169–170). If not, misunderstandings can arise and special cases are seen as standard cases. As a result, it is important to achieve transparency with regard to the national scope of any VET programme used as the basis for allocating a specific country to an ideal type.

These general conditions now constitute the framework for designing a concrete approach. The theoretical basis comprises three models.

The first model includes elements of an approach from the field of sociology (outlined above), which focuses on the constructs of “stratification” and “standardisation”. This approach was developed by Allmendinger (1989) and Kerckhoff (1995) and has been widely commended (see, for example, Descy and Tessaring 2001; Heinz 1999; Blossfeld 1994). In particular, it has proved very productive and informative in international comparative research, especially because it enables interaction with other systems (including the labour market) to be analysed in a structured way (Müller and Shavit 1998; Shavit and Müller 2000; Pilz and Alexander 2011).

In this approach, stratification relates to issues of “tracking” and of the marked differentiation of, and separation between, general training courses and vocational ones. The structure of the VET system as a whole and, indeed, of the labour market is relevant here, so this model is primarily relevant to the macro-level.

Kerckhoff’s (2000, p. 453) broad definition of social stratification is a good starting point:

*The term ‘social stratification’ refers to both a condition and a process. The stratified condition of industrial societies is defined in terms of a hierarchy of classes or occupational positions within the labour force. (...) Social stratification as a process refers to the operation of the mechanisms through which each generation becomes distributed into stratified occupational levels. (...) The most crucial linkage in the social stratification process is between educational attainment and the occupational placement. This is a strong linkage in all industrial societies. The hierarchy of educational attainments is significantly correlated with the hierarchy of occupational positions (...).*

Shavit and Müller (2000, p. 443) have related this approach explicitly to the education system and argue that “[t]he term ‘stratification’ refers to the extent and form of tracking that is pervasive in the educational system.” In their research, they then use the term “tracking” to refer to pupils’ different trajectories through the school system, a view that takes in both the distinction between general and vocational education (and the different routes taken into them) and the differentiation of hierarchical levels by access, selection and transition mechanisms (Allmendinger 1989, p. 233).

Linked to this is the question of barriers to transition or obstacles to progression (Young and Raffe 1998). Another relevant issue is the importance of rankings and league tables for education and training institutions, since such ranking systems not infrequently produce a form of “indirect stratification” (Pilz and Alexander 2011).

Stratification should also portray the status and image of vocational training courses within individual societies (Cedefop 2014; Winch 2013). To simplify, “stratification” needs to be expressed in a duopolistic sense – as either “high” or “low”. It is important to bear in mind that such characteristics are relative values. The same applies to the assessments below.

By contrast, from the perspective we are using here (see above), standardisation is, first and foremost, part of the meso-level. The key question here is how the structures and processes underpinning any vocational education and training system are standardised and made subject to binding regulation (Müller and Shavit 1998; Pilz 2005). Shavit and Müller (2000, p. 443) define standardisation as follows.

*(...) the degree to which the quality of education meets the same standards nationwide. Variables such as teacher training, school budgets, curricula, and the uniformity of school-leaving examinations are relevant in measuring standardisation.*

Standardisation can be given concrete expression and structured by means of differentiating between standardisation activities on the input side, on the process side and on the output side within a VET system. Thus, certification and the accompanying rights and entitlements relate to the output side and are of particular relevance. For example, they may explain whether vocational training courses form part of an exit-based or entry-based system: where follow-on training institutions devalue certificates, this is an entry-based system. Specifically, this element focuses not only on certification but also, and in particular, on curriculum, institutions and teaching staff. Here, too, standardisation is a duopolistic construct.

A second model, borrowed this time from the field of comparative political economy, is that of “skill formation systems” (Busemeyer and Trampusch 2012). This approach fits within the tradition of an institutional political economy (Streeck 1992; Thelen 2004; Culpepper and Thelen 2008) and focusses on the interaction between political and socio-economic institutions and other stakeholders in the VET context (see also the approach taken by Crouch et al. (1999) above in relation to identities). The approach is, therefore closely linked with the popular “varieties of capitalism” approach taken by Hall and Soskice (2001).

It is interesting in this context that the origin of this skill formation system approach refers explicitly to Greinert (see above) and to the concept of stratification (Busemeyer 2009, pp. 384–385; Busemeyer and Trampusch 2012, pp. 8–15). This model, too, has in the past frequently been used in a cross-disciplinary way in an international context (Busemeyer and Trampusch 2012; Busemeyer and Schlicht-Schmälzle 2014). The model operates primarily at the macro-level and correlates particularly with the stratification alluded to above, for example in relation to the relationship between general and vocational education. In addition to the influence of stakeholders on VET policy, the issue of direct funding and financial involvement is also of crucial importance (Busemeyer and Trampusch 2012, p. 21). For our purposes, however, we see stratification again as a self-standing dimension that facilitates differentiation between the depth of differing approaches to VET (see below).

The skill formation model will be taken as the starting point for developing a typology and covers four characteristics (see above). It reveals the influence of the



state on vocational education and training and the potential for activity by, and the influence of, companies. Where both influences are limited, individual influence may be prioritised as the third value (for example, participation in individually funded training provision organised by the private sector). Where, however, state and companies have a high level of influence, this may be characterised as a mixed system. As a result, differing levels of activity produce a total of four different constellations of stakeholders that can then be illustrated in the form of a matrix. This model is not only the starting point for the entire typologisation process (because it follows on closely from Greinert's approach to VET research, for example) but also links to the stakeholder model, which is important in VET, and issues of educational governance (Robertson et al. 2012; Berger and Pilz 2010).

Finally, the explicitly vocational-pedagogical perspective on the micro-level now enters the equation. We cannot make direct use of existing wide-ranging approaches to typology development but need to adapt approaches from diverse areas of vocational pedagogy and teaching design. In specific terms, this means that to reduce complexity, we are unable to use wide-ranging concepts such as "the practice of learning", "activity learning" or "practice-based learning" in their entirety. In addition, some of these concepts – which have developed within specific education and training cultures – risk being focussed too closely on national types. A further challenge at this level is to avoid recourse to general information, such as legislation or general overviews of the VET system (such as CEDEFOP or OECD reports), when analysing and categorising country approaches. Of greater relevance here are the findings of empirical research into specific teaching models, such as studies of lessons. However, for many countries, such findings are limited or rudimentary. Analysis is, therefore, restricted to the most common elements in training practice and does not cover specific theory-based approaches.

Accordingly, our focus is a broad one and centres specifically on the concrete relevance of teaching and learning processes to vocational practice or to trainees' later roles within the employment system. The focus on specific teaching and learning processes makes this a micro-level study and is the only way in which differences between the prescribed curriculum and the enacted curriculum can be analysed (Edwards et al. 2009).

To achieve this, we have narrowed our focus further and will make use of two established approaches from the pedagogy of vocational education and training. The subsequent country case studies then illustrate the more detailed application.

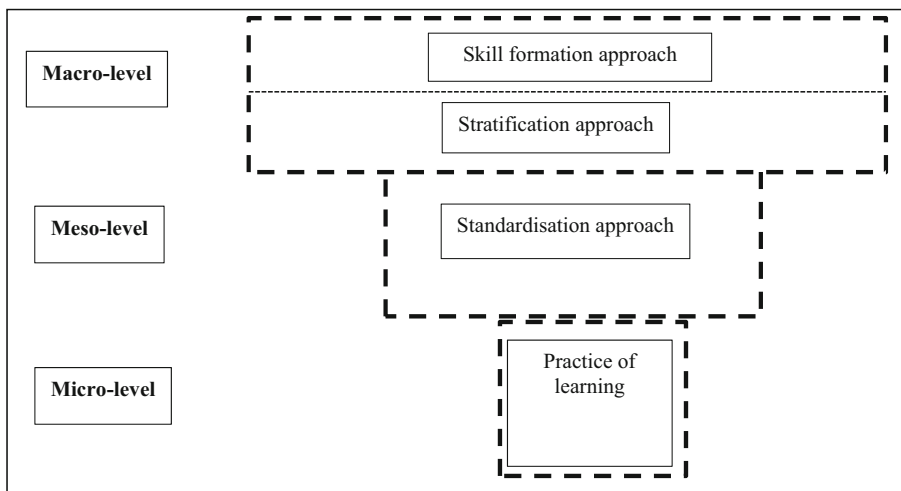
First, the learning content delivered may be analysed in relation to both its theoretical and its practical content. At operational level, this would, therefore, include aspects such as the skill acquisition expected as a result of a particular learning process (e.g. the role of self- and social competences; see Brockmann et al. 2011) or the selection and structuring of the topics covered and the balance between a technical skills orientation and a situational orientation. Of particular significance here is also the question of whether, as part of vocational learning processes, implementing curricula within classroom teaching produces a fragmentary and poorly integrated acquisition of skills or whether a system focuses instead on the acquisition of complete and complex performed actions in the context of situated learning (i.e. planning, implementation and review) (see, for example, Billett 2001; Evans et al. 2006).

Second, this last point illustrates the crossover with a further approach, this time related to the kinds of teaching and learning involved and, hence, the teaching process. Heavily teacher-centred learning activities can be interpreted as substantially influenced by theory.

Here, the interaction and social relationships between teachers and learners (such as teacher-centred work versus group work or receptive learning versus discovery learning), the level of freedom learners have within the learning process (self-directed learning), and the individualisation of learning processes all play a part. Furthermore, the practical relevance of the media and methods used, including such teaching and learning arrangements as case studies, is also important (see, for example, Grossman et al. 1989; Achtenhagen and Winther 2014; Achtenhagen 2004). This pedagogical perspective shifts the focus of the analysis away from the learning location (see discussion above about Greinert's approach) and replaces it with the specific teaching and learning process. The focus is, therefore, explicitly on the micro-level. This helps to highlight the issues surrounding the categorisation of learning locations at the theory/practice level: theoretical learning may well also take place in companies, while practical learning may well also take place in schools, for example, in a training workshop. On the other hand, the hypothesis of an explicit focus on the product of vocational education and training is retained. The theory includes diverse approaches to an understanding of this kind in research on workplace learning (e.g. Fuller and Unwin 2013; Gruber et al. 2008; Dehnbostel and Dybowski 2000). In short, a duopolistic scale – “high” or “low” – is needed to assess the practical relevance of teaching and learning processes.

The four dimensions derived in this way represent a compromise. On the one hand, it would be possible to devise a system with a large number of dimensions that would portray a very accurate picture but would be too detailed to enable a clear view to be formed. On the other hand, it would be possible to focus on a single dimension, but this could lead to oversimplification or to excessive generalisation (see above). This approach therefore constitutes a compromise. A further point is that the dimensions developed are not entirely independent of each other but are interdependent. However, the ranking on the three levels clearly demonstrates the main focus of each dimension (see Fig. 1).

To use this approach, it is appropriate to begin at the macro-level and there to prioritise the skill formation approach (see above). This approach then forms the starting-point for further analysis. The reason for this is that many conditions are set



**Fig. 1** The four dimensions in the context of allocation to specific levels

at macro-level that then have further consequences at meso- and micro-level. At the same time, the skill formation approach has proved its value, both in theoretical discussion about the control of VET systems and in the broader context of typologisation and cross-country comparisons (see above).

The four characteristic forms in the skill formation approach and the two rankings on the remaining three dimensions (high or low) generate a total of 32 potential combinations (Fig. 2).

It would be unrealistic to assume that all these potential combinations are equally internally consistent. For example, within a VET system with a high degree of state organisation, it may be assumed that standardisation will be high. By the same token, in a system that is primarily organised by companies, it may be assumed that the level of standardisation will be low. However, as noted above, not all classes or potential combinations within a typology are represented by real types. Nonetheless, having a wide spectrum of variants – at least in theory – creates a broad focus and does not a priori rule out any options. For example, even within a system that is strongly tailored to private initiative – that is, that has low levels of state influence and company influence – it may still be the case that there is a high level of standardisation if private sector training providers are subject to common standards and external oversight, albeit not generally from the state.

The approach propagated here also has a number of other weaknesses that need to be acknowledged. For example, it cannot provide analysis of the full diversity of VET activities or of all facets of the very different VET models available internationally. Here, too, the restriction to “standard cases” that is common to all international comparisons applies (see above), meaning that other interesting VET options, such as traditional apprenticeships in the UK or full-time vocational schools in Germany, are ignored. This limitation leaves a

Skill formation mode	Stratification	Standardisation	Practice of learning
State dominance	high	high	high
		low	low
	low	high	high
		low	low
Company dominance	high	high	high
		low	low
	low	high	high
		low	low
State and company dominance	high	high	high
		low	low
	low	high	high
		low	low
Individualised (low state and company activity)	high	high	high
		low	low
	low	high	high
		low	low

Fig. 2 Dimensions and main characteristics

certain amount of leeway for interpretation of what constitutes a “standard case”. This leeway also relates to all dimensions of the approach described here and subsequent interaction with the characteristics detected for a specific country. Only intensive analysis of country specificities and explanation of the decision-making procedure that underpins rankings can begin to make such leeway transparent.

The next step is to use the dimensions we have developed to rank individual real types (that is, the existing VET systems of individual countries) in accordance with a typology made up of ideal types. If a large enough number of countries is considered, it will be possible to identify those elements in the typology that often, in reality, correspond with or approximate in formal terms to actual VET systems. It will then be possible to attach an appropriate categorisation or nomenclature to these ideal types.

### Categorising Individual Countries

Below, we allocate individual countries to the typology for illustrative purposes. The main aim here is to demonstrate how categorisation works and the results that it throws up. Space constraints prevent us from giving a detailed account here, so we shall not present each country in detail but will merely outline the consequences of each assessment in the context of the dimensions used. As the model goes on to be used, a comprehensive country classification requires consistent identification of the elements of a country’s VET system and a detailed and robust description of all the stages involved in the categorisation process. The sources or empirical findings used also need to be made transparent.

Within the skill formation approach, the USA is seen as having a liberal approach with a low level of state and company influence and a high level of individual influence (Busemeyer and Trampusch 2012, pp. 12–14). Both stratification and standardisation are characterised as “low” (Müller and Shavit 1998, p. 14). At micro-level, there is a strong practical orientation to “learning by doing” at the workplace if college courses, which tend to focus more on general training, are excluded (Zirkle and Martin 2012) and the widespread model of skill development at the workplace is given priority (Barabasch and Rauner 2012).

This produces the following categorisations for the USA:

USA	Skill formation	Stratification	Standardisation	Practice of learning
	<i>Individualised (low state, low employer activity)</i>	<i>low</i>	<i>low</i>	<i>high</i>

France, by contrast, is deemed to have a VET system that is primarily state-oriented (Busemeyer and Trampusch 2012, p. 12). Against a backdrop of strongly segmented practice between general and vocational education and training, stratification can be classified as “high” (Géhin 2007).<sup>2</sup> Standardisation is also classified as “high” (Müller

<sup>2</sup> Müller and Shavit’s slightly different assessment (1998, p. 14; medium stratification) is the result of their three-point scale; we are using a two-point scale here.

and Shavit 1998, p. 14), and teaching and learning processes are strongly theoretically-oriented with a low level of relevance to practice (Brockmann et al. 2008).

The categorisations for France are as follows:

<b>France</b>	Skill formation	Stratification	Standardisation	Practice of learning
	<i>State dominance</i>	<i>high</i>	<i>high</i>	<i>low</i>

Japan's approach to vocational education and training is strongly dominated by companies (Busemeyer and Trampusch 2012, p. 12; Thelen and Kume 1999). The question therefore arises of whether the country can be said to have a VET "system" at all, given the scant involvement of state structures. However, the approach we are using here enables precisely such less formalised approaches to vocational training to be analysed. Stratification can, therefore, be categorised as "high" if the informal elements of training, which are of importance in Japan, are given appropriate significance (Eswein 2012; Pilz and Alexander 2011; Kariya 2011).<sup>3</sup> Standardisation is categorised by Müller and Shavit (1998, p. 14) as "high", although only if informal mechanisms are taken into account, while teaching and learning processes within companies are geared to practice (Eswein 2012; Pilz and Alexander 2011).

<b>Japan</b>	Skill formation	Stratification	Standardisation	Practice of learning
	<i>Company dominance</i>	<i>high</i>	<i>high</i>	<i>high</i>

Many studies single out Germany for its 'dual' training system in which the state and companies share responsibility for vocational training (Busemeyer and Trampusch 2012, p. 12; Deißinger 1995; Greinert 1988). Both stratification and standardisation are categorised as "high" in Germany (Müller and Shavit 1998, p. 14; Blossfeld 1994). For example, vocational training at the macro-level is entirely separate from general education, with independent stakeholders, responsibilities and sources of funding. Standardisation of curricula and assessment procedures is also very marked in the dual training system (Hippach-Schneider et al. 2007; Greinert 2002; Pilz 2005). Learning processes are geared to practice or actually form part of practice, with the result that practical relevance is paramount both within workplace learning in the training company and within the vocational school, for example, through training workshops) (Deißinger 1995; Blossfeld 1994).

<b>Germany</b>	Skill formation	Stratification	Standardisation	Practice of learning
	<i>State and company dominance</i>	<i>high</i>	<i>high</i>	<i>high</i>

The dominant context in India is one of low levels of state and company influence (for a fuller account, see Mehrotra 2014 and Agrawal 2012). Stratification is considered "high", in particular because of the strict separation between general and vocational

<sup>3</sup> These findings diverge from those of Müller and Shavit (1998, p. 14; low stratification), who argue primarily at the formal level.

training (Singh 2012; Venkatram 2012; Pilz and Li 2014). By contrast, skill formation in the Indian system is dominated by informal structures and processes, with VET institutions, certificates and formal curricula playing only a minor part. As a result, standardisation is classified as “low”, and within this predominantly informal system, learning processes tend to be directly linked to practice (Singh 2000; Venkatram 2012).<sup>4</sup>

<b>India</b>	Skill formation	Stratification	Standardisation	Practice of learning
	<i>Individualised (low state, low employer activity)</i>	<i>high</i>	<i>low</i>	<i>high</i>

China can be regarded as a country with a strong state influence on vocational education and training (Pilz and Li 2014). The clear separation of vocational training from general education and training, along with restricted scope for ‘progression’ within vocational education and training, suggest a high level of stratification (Shi 2012). Standardisation in VET is “high”, but training is not highly geared to practice (Shi 2012; Pilz and Li 2014).

<b>China</b>	Skill formation	Stratification	Standardisation	Practice of learning
	<i>State dominance</i>	<i>high</i>	<i>high</i>	<i>low</i>

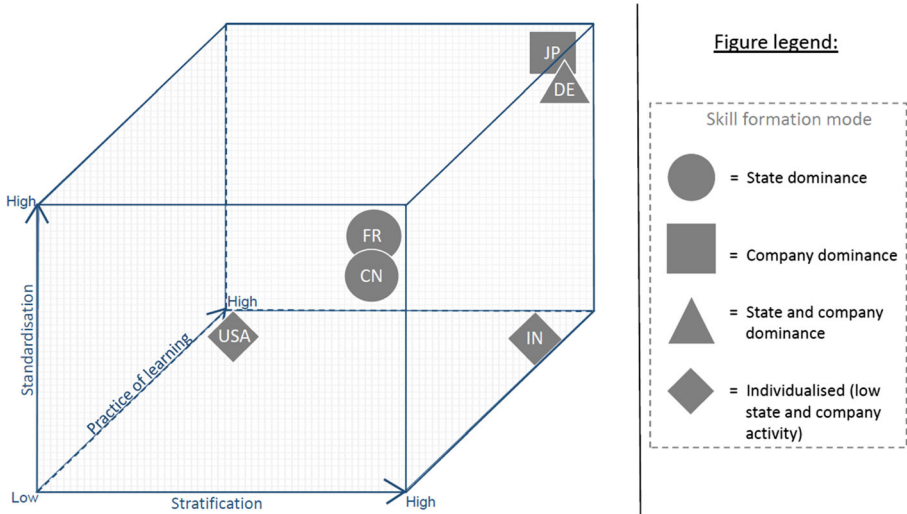
The categorisation of real types to individual dimensions and the emergence of recurring patterns of ideal types can be achieved by forming and analysing clusters. Visually, this can be illustrated in a three-dimensional graphic illustration: Fig. 3 demonstrates this for the examples discussed in the previous section.<sup>5</sup> As already noted above, categorisation as “high” and “low” should be interpreted relatively. The various sub-criteria of each dimension may be weighted differently according to their country-specific importance. Moreover, we would again point out that categorisation does not constitute a cross-country measure and, therefore, says nothing about the relative value and quality of individual VET systems in the comparison.

Even this small number of illustrative country categorisations throws up some interesting findings. For example, two countries with differing skill formation modes (Japan and Germany) correlate to a substantial extent on all three of the remaining dimensions and, thus, across all three levels. By contrast, countries with an identical skill formation mode (USA and India) diverge substantially on the stratification dimension. It is not possible here to enter into a more detailed discussion on the basis of the small number of country categorisations already carried out and the limited options for implementation: we are focussing here on illustrating how the model works rather than generating findings from the typology.

<sup>4</sup> By contrast with informal skill formation, the formal vocational education and training system in India is less important in quantitative terms (Pilz et al. 2015). The formal vocational education and training system shows a clear dominance of “theory driven” teaching and learning (Mehrotra 2014 and Agrawal 2012).

<sup>5</sup> To determine the scale and/or relevance of a particular aspect of the vocational education and training system as a whole (see discussion above), the relative number of participants in a programme can be quantified as a proportion of all participants in vocational education and training. This proportion can then be reflected in terms of the size of the relevant symbol. Thus, a large symbol may represent extensive uptake (for example, 80 % to 100 % of an age cohort in VET complete the relevant part of the system), while a small symbol signifies a smaller importance (below 50 %, for example).





**Fig. 3** Categorising the findings for individual countries

### Perspectives

In future, it is likely that there will be interest in expanding the approach through analysing and including additional countries. The comparison involved in clustering reveals similarities and divergences that may be beneficial in a number of respects.

Consideration must, however, be given what specific advantages this approach might offer. A distinction needs to be made here between two levels. From a narrower perspective, it offers advantages compared with previous typologies. From a broader perspective, it adds value in general terms to an internationally comparative approach.

In relation to the advantages over existing approaches (see above), this approach is designed broadly enough to enable it to use one consistent model to analyse very diverse approaches to vocational education and training, ranging from informal VET (common in India; see above) to strictly regulated approaches (as in Germany). Moreover, the approach moves beyond the macro- and meso-levels and explicitly embraces the micro-level at which teaching – ultimately the most basic element within VET processes – actually occurs (Grollmann 2009, p. 255; Ertl and Frommberger 2008, p. 265). This means, for example, that at least some aspects of processes that often go unconsidered at the crucial teaching and learning level can be included in an international comparison (Berger et al. 2012) (see above).

The approach also counters the criticism commonly made of typologies – that is, that the criteria selected for analysis are, in fact, an incoherent hotchpotch (see above). We have developed this approach systematically and been led by theory from the outset. Moreover, the clear structure aims at striking a balance between optimally clear categorisation of real types on the one hand and a manageable number of criteria on the other.

In terms of limitations, however, we acknowledge that producing a robust categorisation requires the necessary data to be gathered for all the countries that are to be analysed. This may be more difficult for countries that have no tradition of research into vocational education and training or that have not traditionally reported such data. This limitation is, however, also true of all other typologies.

With regard to the general added value represented by this typology, we would like to return to our criticism of the argument put forward by Lauterbach (2003). While typologies cannot and should not reach a judgement as to which VET system is “the best”, the model presented here does offer the capacity to categorise a range of different systems and approaches and, hence, to identify similarities, differences and, where appropriate, trends (Georg 1997, p. 163). Moreover, future international benchmarking procedures or large-scale assessments of vocational training may benefit from using typologies to contextualise and interpret their findings (Ertl and Frommberger 2008, p. 266).

The fact that the approach presented here take account of all three levels and links sociological, political and vocational training approaches also creates scope for a comprehensive picture to be drawn up of the reality of vocational education and training across countries (Georg 1997, p. 164). This is particularly crucial to any comparative research: “[I]t is a necessary pre-condition for any researcher in a comparative research project in the field of TVET to constantly reflect on the relationship between different levels of analysis...” (Grollmann 2009, p. 256).

In the context of current trends, the model has a number of pragmatic benefits, which we shall touch on here. In connection with the transfer of VET provision from one country to another, for example, it can provide important information on whether the planned transfer of elements of the provision will also map on to entirely different situations at all three levels in the recipient country and whether a transfer will, as a result, be impossible or possible only with wide-ranging adaptations. A good example in this context is the transfer of Germany’s ‘dual’ training model to countries such as the USA and India (Pilz and Li 2014). The multi-level analysis shows extremely clearly that in these countries, transfer can be only partial and will closely follow national characteristics.

In relation to international labour markets, but also to investment markets, the approach outlined here may help to improve the accuracy of signalling and achieve transparency. It sends vital signals to companies wishing to recruit or train employees for their subsidiaries in other countries: the typology rapidly demonstrates the prior vocational skills and existing certification local applicants have, making it easier for companies both to manage their own training needs and to manage the level of demand from specific forms of work organisation. On the other hand, the typology is also able to support internationally mobile employees in making their vocational qualifications transparent to other countries: recognition of vocational qualifications outside employees’ home country depends crucially on the quality of the information that the receiving country has about the structures, processes and quality of VET in the country of origin. Here, the typology facilitates early, systematic and transparent access to such information.

In summary, we would argue that an eclectic approach that incorporates the two existing and internationally tried and tested approaches creates a new and applied model. Its specific innovation lies, however, not only in the interweaving of these two approaches but also in its structuring across the three levels of vocational education and training systems and its explicit focus on the micro-level. Since this is where the practical value of teaching and learning processes is based, this model makes it possible to overcome the problems inherent in other approaches that more closely link the learning location with theory and/or practice (see above). As a result, the new approach makes it possible to analyse and categorise VET systems much more accurately: such analysis and categorisation bundles aspects relating to the political economy, sociology

and pedagogy in one consistent, overall approach. For example, the approach helps to make certification transparent across national boundaries (the meso-level; see above) in exactly the same way as it takes consideration of aspects of the control and influence of training policy, for example with regard to issues of supranational comparison or the transferability of control processes in VET systems. And, of course, it the central level of teaching and learning the central focus: ultimately, it is at this level that the central activities of vocational learning and, hence, the acquisition of competencies actually take place.

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