Bridging knowledge with skills and competences in school curricula: evidence from policies and practices in nine European countries

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Introduction

The international economic crisis has speeded up the pace of change in our economies and societies with important implications on the labour market. Some types of jobs are vanishing, other new jobs are emerging in the same time that the skills needed for the existing jobs are changing. Specialised technical knowledge is still (and will always be) essential, but equally important are the cross-cutting competences that enable people to cope with and pursue more flexible career pathways.

The issue of employability becomes crucial for the young generations today. The economic crisis has driven youth unemployment even higher than before –standing at an average of around 21%. Large numbers of young people – one in seven – are leaving school with only basic qualifications at best: for the most part, condemned to unemployment or dead-end jobs (Eurostat, 2010). Many graduates are leaving university without the employable skills that can gain them entry to the labour market. In the same time, skills forecasts for the next ten years show that low skilled and unqualified people will have scarce opportunities for employability in comparison to highly qualified people (Cedefop, 2010a).

To ensure a better match between skill needs and supply, policy makers need a better understanding of the knowledge, skills and competence that people have and those that are and will be acquired. To this end, the potential benefits of an approach to vocational education and training (VET) based on learning outcomes – valuing not just what students know, but what they can do with their knowledge and skills at the end of a learning process - have been widely acknowledged by all European countries (Cedefop, 2009a). Increasingly, VET qualifications are shaped around acquired knowledge, skills and competences and members states develop overarching national qualification frameworks defining level descriptors based on learning outcomes.

However, if qualifications are to be awarded on the basis of achieved learning outcomes, this raises the question how curricula and learning programmes must be designed to lead learners to the intended learning outcomes. Policy makers involved in curriculum development come across key policy dilemmas: How to find a way to balance the skill needs of employers and the skill needs of individuals recognising that people have different needs, backgrounds and goals? How to ensure that VET curricula are responsive not only to the existing qualifications but also to new emerging jobs?

Little is known to date in a European comparative perspective on curriculum changes addressing the above mentioned issues. The present paper aims to shed some light on the rational behind recent curriculum reforms and the role of learning outcomes in VET curricula. It does so by comparing curriculum policies in nine European countries and analysing learning programmes in the occupational field of Logistics.

The first chapter presents the scope of the study, the research design and tools. The second chapter analyses the different backgrounds and motivations for launching outcome-oriented curriculum reforms based on literature review. The third chapter presents national initiatives bridging knowledge with skills and competences in VET curricula. The fourth chapter illustrates these initiatives with examples from Logistics curricula in nine countries. The fifth and last chapter summarises the main conclusions drawn, addressing new lines for research needs.

1   Research design: questions and tools

Findings presented in this paper draw from the latest Cedefop publication on "Learning outcomes approaches in VET curricula: a comparative analysis of nine European countries" (Cedefop, 2010b). It is part of an extensive comparative research work that Cedefop is conducting over the last three years exploring the role of learning outcomes approaches in vocational education and training provision.

The present study is based on the initial hypothesis that given the increasing emphasis attributed to learning outcomes at European level, national curricula traditionally knowledge-based are now changing towards a more outcome-oriented approach. These approaches are characterised by defining the expected knowledge, skills and competence individuals acquire at the end of a learning process. To explore this hypothesis, the paper aims to analyse:

- To what extent curriculum reforms have been launched in VET introducing learning outcomes and what are the rationales behind these reforms?
- What is the role of learning outcomes in VET curricula in relation to the teaching and learning process?
- How has the introduction of learning outcomes affected the content and organisation of VET curricula contributing or hindering learner-centeredness?

To address these research questions, overall trends in curriculum reforms in relation to outcome-oriented approaches were analysed and compared in nine selected countries. The choice of countries was based on geographical and geopolitical criteria; the characteristics of educational systems (e.g. decentralised versus centralised system); and the degree of experience/tradition in using learning outcomes. With respect to these criteria, nine countries were selected for in-depth study: France, Germany, Ireland, Netherlands, Poland, Romania, Slovenia, Spain and the UK - Scotland. The analysis focuses on initial VET, especially on the training paths taken by most students.

For deeper insights into the effects of learning outcomes on curriculum development, one vocational programme was analysed in each country in the field of logistics. Logistics was chosen given it is a growing sector in Europe, with jobs (excluding transport and support) representing approximately 2-2.5 % of overall employment[2]. The branch is subject to a high degree of international mobility and professional challenges due to changing technologies. As a consequence, curricula in logistics are often newly created or up-dated, offering a good example for analysing current reforms.

Both primary (interviews and surveys) as well as secondary research (literature review) were carried out to provide empirical materials for a comparative analysis of curricula and learning programmes. The desk research, among other sources, included national country reports, legislation and policy strategies on curriculum, assessment, textbooks and teachers training, as well as guidelines and support materials published by national curriculum authorities. In addition, written and oral semi-structured interviews were conducted with national experts to complement the desk research.

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[2] Logistic training database: http://www.novalog-project.org/english/database/ [cited 30.04.2010]

2 Rationale using learning outcomes in VET curricula

Shifting the focus from inputs to outputs in education and training provision has its routes in different factors among which to the rise of competence-based approaches in education and to changes in the way people are recruited nowadays; employers attach far more importance to the competences and transferable skills of job seekers than to their formal qualifications. The following subchapters present these different factors based on analysis of curricular reforms over the last twenty to thirty years.

2.1 Learning theories focusing on competences and learning outcomes

One of the reasons explaining this increasing emphasis on learning outcomes when designing VET curricula, are the new theoretical insights and research findings we now have on the aspects influencing learning processes.

In the past twenty-five years, cognitive research has provided important findings about the brain, with scientists being able to examine its internal organization and processes. This allows researchers to observe how and where information is manipulated in the learning process. One finding is that the brain makes sense of the world by constructing meaning from the information around it. It connects held information to the new concept that it is trying to understand. The metaphor of the brain as a computer with connected networks is often used to describe the functioning of the brain cells and transmitting procedures.

But recent research suggests that the brain is more like a "regulated jungle". However, important to educators is the whole-brain approach replacing the older partition models in which certain functions were assumed to be isolated in specific parts of the brain. Understanding how the brain learns – by acquiring, sorting, and conserving information – allows educators to devise the appropriate kinds of instruction and environments that activate the brain's natural abilities and promote student learning (Gregory and Parry, 2006). According to these findings, connections between different concepts must be made explicit and learners must have the opportunity to make their own connections by engaging in discussions and activities that promote the concepts of formation and comprehension.

"Schools, therefore, need to provide a rich variety of experiences that activate students' brains. This is compatible with the brain's genetic disposition to thrive on complexity and to use a multisensory or parallel processing approach to derive meaning from complex situations. Therefore, the most favourable learning activities to activate neural networks are those that are complex, engage a variety of the senses, and are perceived by the learner as being novel, emotionally engaging, relevant and useful" (Gregory and Parry, 2006, p. 32).

As early as 1991, Caine and Caine formulated features of brain-based learning; students should have many choices for activities and projects and foster patterning by drawing relationships through the use of metaphor and demonstrations. Therefore teaching methods should be complex, lifelike and integrated, using different media

and materials. Brain-based learning should encourage the brain's ability to integrate information and "involve the entire learning in a challenging learning process that simultaneously engages the intellect, creativity, emotions and physiology" (Caine and Caine, 1991, p. 8).

Behaviourist, cognitivist and constructivist learning theories all acknowledge the benefits of linking learning processes to typical daily and work situations. Curricula based on learning outcomes focus on the results of learning processes. A difference must be made, however, between objectivist approaches, which lead to the definition of detailed outcomes for assessment purposes, and the subjectivist (constructivist) approach, in which, learning is an open-ended process through which outcomes are constructed in the learner's mind according to his/her individuality. The latter approach calls especially for active learning methods and a learner-centred approach to teaching based on formulating broad outcomes to guide the learning process.

The use of learning outcomes in curricula can therefore have different theoretical backgrounds from which constructivist approaches are associated with more holistic understandings of learning outcomes.

2.2   *Linking education and labour market*

As we have referred in the introduction of this paper, one of the major reasons for using learning outcomes in curricula is the expectation that this will strengthen the link between VET systems and the labour market; a need which became even more prominent in the current economic crisis Europe is facing.

Other economic crises during recent decades, especially in the 1980s and 1990s, also led to extensive reforms in the various systems of vocational education and training. The shortage of work places and the need for qualified staff in the new branches and for certain qualifications, both raised questions about the match between vocational education and training programmes and the requirements of the labour market. These new requirements arose from the shift to a service-oriented economy and diverse technological developments, both followed by changes in company organisation and processes.

Other factors were social and demographic challenges like migration and decline of the birth rate. Young people were the most affected by these changes. Their transition into the labour market was hindered by the shortage of workplaces and by new requirements which the students were assumed not to meet adequately. Mostly the VET-systems were considered as too 'academic' and not 'realistic' (e.g. Spain and Netherlands), being traditionally school-based and very much similar to the general/academic system (e.g. France). Traditional qualifications and the classical ways of instruction did not cope with the needs emerging in the modern economy and with the new forms of labour organisation.

To cope with these challenges, curricular reforms (in all the countries analysed) largely aimed at strengthening the match between the educational offer and employment requirements by carrying out phases of workplace learning in companies (e.g. France, Spain, Scotland, the Netherlands, Poland and Slovenia). In this context,

learning outcomes played a crucial role in curricula in aiding coordination between school-based and work-based learning.

2.3 Steering VET-systems through outcome-based curricula

The curriculum is an essential instrument for steering the education system. In this context, learning outcomes used in curricula can be considered as standards (i.e. norms and specifications) or "adjustment factors of action" (North, 1990) influencing the behaviour of actors in training and education system, insofar as they fulfil a normative function. The introduction of learning outcomes in VET curricula must, therefore, be examined also in the context of new trends in public management and VET governance.

Educational processes are traditionally regulated through "inputs" which means via the regulation of the contexts of societal actions. Curricula defining subject-related knowledge to be transmitted are classic instruments of the input regulation of education and training. With this type of regulation, VET providers (including teachers) are responsible, but not accountable for the learner's achievement: "Not the fulfilment of a plan but the conformity of a plan has to be controlled and accounted for" (Künzli, 1999, p. 24). In this, the input curriculum opens up a relatively wide leeway for the organisation, execution and control of the lessons which at the same time have to be fulfilled in a more individual responsibility.

Attempts to define outputs and outcomes can be traced back to the definition of "learning objectives" in the 1960s and 1970s, for instance in Unites States and Great-Britain. The product orientation, without disqualifying steering through inputs, represents a shift in control and accountability concerning learning results. In this context, the use of learning outcomes represents a regulative and didactic change of perspective (Sloane, 2007). The difference between "learning outcomes" and "learning objectives" is usually defined with regard to implied design constraints in the learning process. Learning outcomes are seen as much broader and formulated in a more open way than learning objectives giving the training providers and teachers more room for meeting learners' needs than learning objectives.

This trend towards output-based steering in education and training systems is becoming evident in many European countries by defining educational and/or occupational standards and curricula based on learning outcomes, and by introducing performance-based funding mechanisms (Cedefop 2009b, p.18).

Finally, the use of learning outcomes in curricula is also seen in the context of quality assurance debates in many countries (Cedefop, 2009c). A commonly agreed thesis is that steering only through input factors is not sufficient to ensure better quality and relevance in education and training, and that more importance must be granted to the "output" of educational systems, specifically the "outcome" of learning processes (Blömeke, Herzig and Tulodziecki, 2007).

2.4 EU-Policy on transparency and international mobility

Two important European policy developments endorsed with the Recommendations of the European Parliament and of the Council on key competences for lifelong learning (2006) and the European qualifications framework for lifelong learning (2008) have influenced significantly the adoption of national education and training policies emphasizing outcome-oriented approaches. While the former recommendation defines eight key competences that all young people should develop at the end of their initial education to a level that equips them for further learning and working throughout their life, the latter, establishes eight qualifications levels defined in learning outcomes and describing the knowledge, skills and competences acquired at the end of a learning process.

Since then, numerous European policy documents underlined that curriculum reform and renewal is an important means for promoting outcome-oriented approaches and key competences in lifelong learning making education and training systems more relevant to the knowledge-based Europe of the future (e.g. Council conclusions on Improving the quality for teacher education, 2007 and Commission Communication on Improving competences for the 21st century: an agenda for European cooperation on schools, 2008).

The Council conclusions (2009) on a strategic framework for European cooperation in education and training in the period up to 2020 ("ET 2020"), establish as a strategic objective "to take greater account of transversal key competences in curricula, assessment and qualifications" in accordance with the 2006 recommendation of key competences for lifelong learning. Later, the Council conclusions of 26 November 2009 on developing the role of education in a fully-functioning knowledge triangle (education, research, innovation), encourages education and training institutions to accelerate pedagogical reforms ensuring that curricula, as well as teaching and examination methods at all levels of education, incorporate and foster transversal key competences.

More recently, the Draft Council conclusions (March 2010) on competences supporting lifelong learning and the "new skills for new jobs" initiative stress the need for further developing the key competences approach beyond the schools sector, into adult learning and into vocational education and training (VET) linked to the Copenhagen process. "Curriculum design, teaching, assessment and learning environments should be consistently based on learning outcomes and particular emphasis should be placed on those transversal competences that require cross-curricular and innovative methods. To achieve the transition to a competence-based approach, efforts should also be made to ensure that teachers and trainers are equipped with the appropriate pedagogical and other necessary skills".

These European policy recommendations demonstrate an existing consensus at European level on the fact that curriculum is as a dynamic framework guiding teaching and learning processes and an important steering mechanism for quality. This has become interestingly obvious over the last years, when curriculum from being a static document defining the content to be taught (almost identical to syllabus) is being increasingly enriched to define plethora of other elements including those

assessment and teaching methods that should be applied (see in Annex 1 example of elements defined in curricula of logistics in the nine countries under examination).

These policy developments supported also by EU funds (e.g. European Social Funds) granted to innovative programmes, constitute a favourable background for reforming curricula adopting a learning outcomes approach.

3   Balancing inputs with outcomes in VET curricula

Reporting activities measuring progress made at national level towards the Lisbon objectives show that important developments have been made towards outcome-oriented approaches in education and training.

The 2010 joint progress report of the Council and the Commission on the implementation of the "Education & Training 2010" work programme recognizes a clear trend across the EU towards competence-based teaching and learning, and a learning outcomes approach. Many European countries are reforming curricula based explicitly on the key competences framework; conclusions though point out that more should be done to support the acquisition, updating and further development of the full range of key competences in the areas of vocational education and training and of adult learning and to ensure that higher education outcomes are more relevant to the needs of the labour market.

Cedefop policy report measuring progress on Copenhagen process (Cedefop, 2009d) and the mapping of National qualification frameworks in Europe (Cedefop, 2009e) bring also evidence on the increasing use of learning outcomes in defining qualifications, job profiles and curricula and raise the pressing need to explore further the implications for delivering and assessing reformed curricula in VET.

Referring to the nine countries examined in this study, all of them are or have been recently engaged in curriculum reforms introducing to some extent learning outcomes and a competence-based approach in VET curricula. The scope and the timing of these reforms vary depending on the country and so do the names and concepts attributed to learning outcomes.

In *France* the concept of '*compétence*' has been introduced since1960s although in a behaviouristic context that has evolved overtime to integrate increasingly the results of constructivist theories. In the *United Kingdom*, the term learning outcomes has long been accepted in relation with the development of National/Scottish vocational qualifications (N/SVQs), which were introduced in 1986. In *Ireland*, learning outcomes have first been introduced in the apprenticeship system in 1991. But it is only in relation with the National framework of qualifications launched in 2003, that the definition and use of the term 'learning outcome' was systematically reflected in the policy process. In the *Netherlands,* competence-based education was introduced on the basis of the new Act on vocational and adult education in 1996 under the aim to fully implement this approach in all parts of the VET system by 2010. In *Spain,* the introduction of learning outcomes (competences and capacities) for the definition of qualifications was based on the Law on general organisation of the education system of 1990 (*Ley Orgánica de Ordenación General del Sistema Educativo*, LOGSE),

which was adopted with the primary aim of reinforcing the link between the education system and the labour market.

In *Slovenia*, *Poland* and *Romania* outcome-based approaches have been introduced more recently in curricula, mainly in relation with EU policy instruments and projects. In *Slovenia*, curricula in VET started to be shaped towards an outcome-oriented approach in 1996, following two distinct phases: a first phase until 2001 which was carried out in a PHARE Programme partially financed by the European Union, and a second phase in 2001-07 based on new guidelines for 'The Development of Education' by the Ministry of Education, Science and Sport. In *Poland*, taking further the first steps to introduce learning outcomes in the VET system in 2002, curriculum reforms are underway and will be fully implemented in 2012.
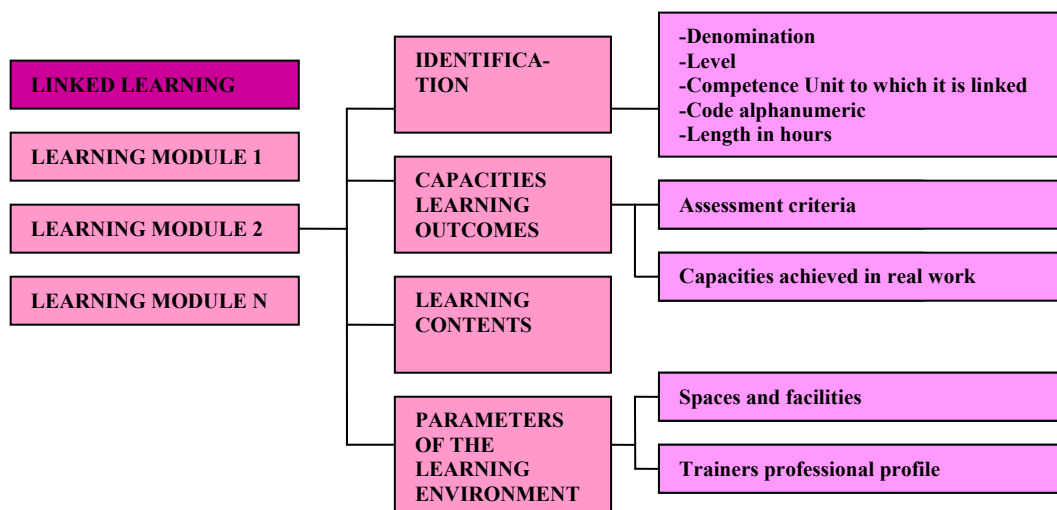
Despite this converging trend, it could be too simplistic to characterize these reforms only as a shift from input- to outcome-focused curricula. First, there is no pure type of input- or outcome-curriculum defined in theory and it is possible to say, on the basis of the empirical researches conducted in nine countries, that curricula are always mixed and that the kinds of "outcomes" they define varies hugely among the countries, so that even two outcome-oriented curricula look very different. The analysis of initial VET curricula in Logistics shows that learning outcomes do not replace learning inputs (contents, teaching and learning methods, timetables, etc.) but in most cases may have a more or less prominent role for defining these inputs.

On one hand, in some countries such as France, learning outcomes are tightly linked to content specifications, and curricula contain a large amount of binding rules concerning learning arrangements. This can be traced back to the main motivation for introducing learning outcomes (*compétences*) in curricula: to bring the mainly school-based VET system closer to employment requirements by illustrating the relationship between professional activities and the knowledge and skills developed in classroom. On the other hand, curricula in the further education sector in Ireland and in the Netherlands are based solely on learning outcomes. In this case, learning outcomes are used as main reference point and maximal autonomy is allocated to training providers to define contents and methods of the teaching and learning process in the learning programme.

In most countries having defined learning outcomes at different levels of the curriculum (see chapter 4), a system of "matryoshka dolls" describing outcomes from the most general to the most detailed is used (e.g. in Spain, Slovenia, Poland and France). Content specifications are explicitly linked to the learning outcomes, for instance through a correspondence table. In the German dual system, the outcome-orientation is seen primarily as a means for linking work-based and school-based learning and such a correspondence table is used in the process of curriculum development to ensure consistency between the school-based curriculum and the work-based curriculum.

The logistics curriculum in Spain can be taken as an example for illustrating the link between the different input and outcome elements of the curriculum (see table 1).

Table 1:   *Learning module structure in Spain*

LINKED LEARNING

LEARNING MODULE 1

LEARNING MODULE 2

LEARNING MODULE N

IDENTIFICA-TION

- -Denomination
- -Level
- -Competence Unit to which it is linked
- -Code alphanumeric
- -Length in hours

CAPACITIES LEARNING OUTCOMES

Assessment criteria

Capacities achieved in real work

LEARNING CONTENTS

PARAMETERS OF THE LEARNING ENVIRONMENT

Spaces and facilities

Trainers professional profile

Source: INCUAL 2009, p. 8.

Curricula in Spain are based on competence units describing professional performance at the work-place. Learning modules are designed related to each competence unit and take a standardized form. Intended learning outcomes are expressed as capacities in a work context and as their related assessment criteria. The learning content leading to the achievement of those capacities is also indicated. In addition, some specifications regarding the 'parameters of the learning context' are made, such as space in workshops and facilities, profile of instructors and others. Training providers are allowed to define the length of the learning module according to the nature of the learners' needs, the learning modality, the number of students and other objective criteria.

We have seen that learning outcomes can specify expected knowledge, skills and competences to be acquired by the learners as well as the means under which these will be achieved. In the following chapter, we will analyse the different functions ascribed to learning outcomes in curricula of the examined countries.

4   The role and function of learning outcomes in VET curricula

Cedefop's recent study (Cedefop, 2010b) points out that learning outcomes may have different functions in VET. This was also found to be true at the level of the initial VET curricula examined in the case study on logistics programmes. Three categories of learning outcomes were identified depending on the function they are ascribed in curricula: defining the overarching goals of education and training, the learning outcomes of a study programme, or the learning outcomes of specific units of training.

4.1 Learning outcomes at the level of VET goals

In some countries, learning outcomes express the overarching goals of education and training. In this case, they are formulated in broad terms, neither occupation- nor subject-specific. A prominent example of such learning outcomes in VET is offered by Germany, with the concept of vocational competence ('*Handlungsfähigkeit*' and '*Handlungskompetenz*'). A similar function is fulfilled by the learning outcomes associated to the 'four capacities' (as successful learners, responsible citizens, confident individuals and effective contributors) included in the "Curriculum for excellence" in UK-Scotland

Contrary to the concept of vocational competence in Germany, which has been developed for VET curricula only, the 'four capacities' in the "Curriculum for excellence" are directed at all segments of education for the age-group from three to 18 years old, including general and prevocational education as well as further education. They are described through attitudes and competences ('...able to:...') general enough to apply to all age groups. These attitudes and competences, which are a kind of very broad and holistic learning outcomes, are further refined and embedded in the curriculum guidelines for each age group.

In other countries, key competences can also be considered in terms of learning outcomes fulfilling the function of overarching goals of education and training with a transversal character, orienting learning processes regardless of the segment of education or occupational sector. Among the countries studied, five have explicitly adopted a set of key competences: UK-Scotland, Ireland, France, Poland and Slovenia. Although they are primarily developed for compulsory education, key competences are also relevant to IVET (France, Slovenia), or even to CVET in UK-Scotland and Ireland. The question raised by these kinds of overarching learning outcomes is how to integrate transversal competences into learning programmes, which are most often divided into either subjects or occupation-based training units. Two approaches can be distinguished, which do not necessarily exclude each other:

A first approach is adopted in the German dual system and in the Scottish "Curriculum for excellence". The overarching goals formulated in terms of competence or outcomes function as guiding principles to develop and assess the other elements of the curriculum and the learning programmes in all subjects and areas. This is expressed in the "Curriculum for excellence" and the experiences and outcomes in the range of curriculum areas built in the attributes and capabilities which support the development of the four capacities. This means that, taken together across curriculum areas, the experiences and outcomes contribute to the attributes and capabilities leading to the four capacities. The expanded statements of the four capacities can also form a very useful focus for planning choices and next steps in learning.

The attributes and capabilities can be used by establishments as a guide to assess whether the learning programme for any individual child or young person sufficiently reflects the purposes of the curriculum[3]. In Germany, the concept of vocational

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[3] http://www.ltscotland.org.uk/curriculumforexcellence/curriculumoverview/aims/fourcapacities.asp [cited 30.04.2010]

competence is translated into didactical principles which guide the work of curriculum development groups and which are explained in the introductory part of the curriculum for the school-based part of VET.

A second approach is using key competences, which are sometimes broken down to a list of knowledge, skills and attitudes providing a direct basis for assessment. In France, references to each of the seven key competences are included in the syllabi and recommendations are issued by the education authorities to explain to teachers how to link key competences with subject- or occupation-based learning programmes. A booklet aiming to document the development of key competences in primary and secondary education, is being tested. In UK-Scotland, the "Curriculum for excellence" includes the five core skills developed in 1995. Curriculum guidelines for compulsory education make clear references to the core skills in order to aid implementation in the learning programmes. National qualifications also include suggestions to teachers for developing core skills in the course of vocational training, whereas SVQs do not. Specific courses are also offered at each level of the Scottish credit and qualifications framework for training in one of the core skills, with the potential to obtain a certificate after assessment. Attainments in the core skills are registered in a core skills profile.

4.2   Learning outcomes at the level of study programmes

A second function of learning outcomes in curricula is to define the specific competences, skills and knowledge to be reached at the end of a study programme. This function is typically fulfilled by learning outcomes expressed in qualification standards. The standards provide the basis for final assessment and for the planning and implementation of teaching and training actions, and are an integral part of the curriculum.

In Ireland, such learning outcomes are included in general standards (level descriptors) and award-specific standards. In UK-Scotland, qualification standards based on learning outcomes determine the learning programmes which are developed autonomously by training providers in post-compulsory education.

In Germany, the skills and knowledge which should have been developed at the end of the two or three and a half years of dual apprenticeship are defined in the training ordinance. They provide an orientation for the planning of training and education actions as well as for assessment, but they are not formulated as performance standards as in Ireland and UK-Scotland.

Finally, learning outcomes in core curricula in Poland, which are named 'kwalifikacja' and integrate skills, knowledge and attitudes, have a similar function and character as in Germany, mainly providing the basis for developing school curricula.

4.3 Learning outcomes at the level of units

Learning outcomes are also found in some curricula at the level of units, where they express the specific outcomes/objectives of single teaching units and precisely determine the contents of training and education programmes. At this level, the case studies in logistics demonstrate that all countries under scrutiny have introduced some kinds of outcome-oriented statements (i.e. 'what learner should know, understand and be able to do'), although these may differ significantly (see annex 2).

At first sight, the variety of names used to designate intended learning outcomes at training unit level in curricula is striking: some are named learning outcomes, some are named aims, objectives, capacities, assessment standards or competences. However, the names are not a reliable indicator for a classification into different types of learning outcomes. From the examples taken from logistics (see annex 2), certain differences exist between the countries[4]:

– In some countries, outcomes statements on the level of training units refer directly to the professional context (e.g. in Germany, France, Ireland, UK-Scotland in the SVQ, Spain, the Netherlands), whereas in others they rather refer to a body of knowledge to be assimilated by the learner (e.g. in Slovenia, Poland, UK-Scotland in the National progression award).

– Some countries define assessment criteria/performance criteria (e.g. in Spain and Scotland in the National progression award), whereas in other countries outcome statements are too vague to be used directly for assessment.

– Differentiations within the category of outcome statements are operated in some countries along the divide between competence and associated knowledge. In the Scottish Vocational Qualifications (SVQs), a difference is drawn between what students should be able to do, and what they should know and understand. In other countries, associated knowledge is not formulated in terms of learning outcomes but as a list of items to be addressed in classroom. In France and the Netherlands, a distinction is made between levels of generality (general versus final competences in France, competence and its components in the Netherlands). Slovenia goes a step further in detail provision, by introducing differentiation between the informative and formative operational aims of each professional competence. The formative aims are very detailed to provide a basis for assessment, whereas the informative aims represent overarching goals of the unit, like contextual knowledge and awareness of the learned topics.

– Learning outcomes are clustered in units reflecting either work-process or traditional disciplines. In France, curriculum delivery is organised in disciplines (e.g. economics and law, applied mathematics, logistics), although learning outcomes within the vocational discipline reflect core functions and tasks of the occupation and so highlight the link between curriculum content and professional practice. In Germany, the reform of 1996 introducing the concept of action

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[4] It must be noted that these differences are only verified in the case of IVET curricula in logistics. The situation might be different in other sectors and in other parts of the VET system.

competence ("*Handlungskompetenz*") in the school-based curricula of the dual system has also introduced a new structure of curricula for the school-based part of apprenticeships. Instead of disciplines, training units are now organised in 'learning areas' ("*Lernfelder*") reflecting the work process (see table 2). The aim of this approach is primarily to foster the integration of practical and theoretical skills and knowledge by aiding the cooperation between vocational schools and training companies[5]. In Spain and Poland, the introduction of outcome-oriented approaches has also led to a shift from subject-based to work-process-oriented training organisation. However, the example of France, where the curriculum remains structured by subjects, shows that this is not a trend in all countries (see table 3).

Table 2:   Comparison of the old and the new curriculum in logistics in Germany

Germany: former curriculum 'Fachkraft für Lagerwirtschaft' (1991)	Germany: new curriculum Fachkraft für Lagerlogistik (2004)
Basics of work and social law (70 h)	Receive and check goods (80 h)
Basics of business administration (20 h)	Store goods (100 h)
Basics of business law (50 h)	Handle goods (60 h)
Basics of transactions (20 h)	Transport goods within the company (40 h)
Procurement and reception of goods (60 h)	Make a production order of goods (80 h)
Storing (100 h)	Pack up goods (80 h)
Commissioning (40 h)	Plan tours (40 h)
Packing (60 h)	Load goods (80 h)
Sending (80 h)	Send goods (80 h)
Transport geography (20 h)	Optimise logistic processes (80 h)
Applied mathematics (160 h)	Supply goods (40 h)
Basics of bookkeeping (80 h)	Calculate and analyse operating figures (80 h)
Data processing (80 h)	

Source: Cedefop, 2010b.

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[5]   In some federal states, learning areas have been clustered again into broader units, for instance in Bavaria (Procurement Logistics, Warehousing Logistics, Transport and Distribution, and Operational processes). The learning objectives and contents of each learning area remain the same as in the national curriculum.

Table 3:   Examples of training units in logistics curricula

France: Baccalauréat professionnel logistique	Poland: Technik logistyk (school curriculum developed on the basis oft he national core curriculum)	Spain: Organización del Transporte y la distribución
Organisation and management of logistic activities: - logistics (416 h) - business management (156 h) - mechanic handling of goods (52 h) - economy and law (104 h) Applied mathematics (104 h) Foreign language (English) (156 h) French (208 h) History and geography (104 h) Applied arts (104 h) Sports (156 h)	Basics of logistics Stock and inventory management Economy of logistics Transport and forwarding agency Logistics planning Logistic systems Electronic economy Training workshop for Logistics and freight forwarding Training workshop for inventory management English for logistics Foreign language for Logistics Practical training	Distributor capillary (90 h) Transportation long distance (120 h) Optimising the logistics chain (120 h) English training for international transport and logistics (90 h)

Source: Cedefop, 2010b.

Summarising the findings on the function and operationalisation of the different categories of learning outcomes in logistics curricula in initial VET, it seems that two approaches to using learning outcomes in curricula can be distinguished. A first approach (regulative approach) uses learning outcomes to define assessment standards which determine precisely the content of learning programmes. A second uses learning outcomes to define the didactical-pedagogical principles orienting teaching and training practices (didactic approach). As in UK-Scotland these approaches are not mutually exclusive.

5   Concluding remarks

The present study allows better understanding of theoretical and conceptual issues behind outcome-oriented policies and practices in the nine examined countries. It highlights the key role learning outcomes play in curriculum reforms and brings evidence of important changes in national curricula.

This study demonstrates that opting for outcome-oriented approaches in curricula is perceived in many countries as a powerful means to make VET systems more learner-centred. There are however some conditions to a successful design of outcome-oriented curricula (Cedefop, 2010c).

First, too narrowly defined learning outcomes can hinder rather than encourage a learner-centred approach. This is highlighted by constructivist learning theories, according to which the learner must play an active role in the construction of meaningful relationships between cognitive, functional, emotional and social skills to be competent in a particular situation. Too detailed and narrowly defined learning outcomes, oriented solely on functional performance, risk imposing constraints on the learning process and producing such effects as 'teaching to the test'.

In practice, a shift can be observed in many countries from behaviouristic approaches to learning outcomes to more holistic understanding of competence. Ireland, UK-Scotland and Germany provide good examples of how to formulate and use holistic outcomes in curricula to encourage changes in teaching and learning practices. At the same time, to fulfil their role as standards for ensuring identical achievement across the country, learning outcomes for each training unit must be clear and precise. Otherwise, curricula are not perceived as relevant in practice for the definition of learning programmes. A balance between the didactic and the regulative role of learning outcomes must be found. This could be based on a careful combination of the two approaches and the distinction in curricula between a holistic concept of competence, or a vision of the broad outcomes aimed at, and more detailed sets of knowledge, skills and attitudes to be achieved and demonstrated through assessment.

Second, learner-centred approaches require a real autonomy for teachers and training providers in defining learning programmes. This means that empowerment and accountability, as in quality assurance, are two essential aspects of learner-centred systems.

To conclude, holistic, broadly defined learning outcomes may have significant potential for making systems more learner-centred, however, there is obviously a need for accompanying measures at all levels of the VET system.

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Annex 1: Elements defined in logistics curricula in initial VET

Elements of a curriculum	DE	FR	IE ([6])	NL	PL	SI	SP	UK ([7])
'Vision' of the learner/overarching goals of VET	x					x	x	x
Key competences		x	x			x		x
Occupational standards or professional profile	x	x	x	x		x	x	x
Qualification standards (competences expected at the end of the program)	x	x	x	x	x	x	x	x
Outcomes/objectives at the level of training units	x	x	x	x	x	x	x	x
Assessment criteria		x	x	x		x	x	x
Content specifications	x	x		x	x	x	x	
Textbooks					x	x		
Learning arrangements (*prescribed or **proposed)		x*						x**
Learning place	x	x		x	x	x	x	
Guiding principles on teaching and learning methods	x		x					x
Assessment methods	x	x	x			x		
Timetable (duration for each subject/module)	x	x			x	x	x	
Progression (distribution of subjects/units over time)	x	x				x	x	
Distinction between compulsory and optional Modules/Units			x			x	x	x
School curriculum or learning programme to be approved/accredited by public authorities			x		x			x
Percentage of the curriculum to be defined locally				20 %	5 %	20 %	35-45 % regionally, up to 10 % at school level	

Source: Cedefop, 2010b.

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[6] FETAC award (further education sector). Curricula in pre-vocational training are very different in various aspects from those in further education.

[7] Scotland, National Progression Award and A Curriculum for Excellence. Curricula for Scottish Vocational Qualifications (SVQs) and curricula in other regions of the UK are different.

Annex 2: Excerpts of curricula in logistics: learning outcomes at teaching unit level

France	Ireland	Netherlands	Spain
Baccalauréat professionnel logistique	**FETAC minor award 'Warehouse Skills' N12728 at level 4**	**Logistiek teamleader**	**Organización del Transporte y la distribución COM_ 317**
Unit: Implementing the logistic function	Unit: Inventory Planning and Stock Control Techniques	Core task 1: Coordinates and participates in the reception and storage of goods Working activity 1.1: Coordinate the reception and storage of goods	Learning module 'Optimizing the supply chain'
Students should be able to… • receive goods • plan the reception • find the number of incoming vehicles • identify the regulated timeframe for unloading • calculate the time for unloading the vehicles • plan receptions and allocation of terminals • … • receive the carriers • … • participate in unloading activities • store • … • manage and track stocks • …	*Learners should be able to:* • critically evaluate and implement stock control systems • describe the classification of stock using the ABC Analysis • describe the classification of stock according to purpose • define and illustrate SMART Goals for stock planning • design an effective stores system that keeps track of stock …	*Competence:* • Plan and organise *Components:* - Plan activities - Organise time - Assess progress *Performance indicator:* 'The logistics team leader plans, regulates and monitors logistics activities for the receipt and storage of goods, and ensures that goods are stored properly and according to work priorities. He does this based on realistic time estimations and the effective and efficient use of available capacities.' *Competence:* • Decide to initiate an activity: *Components:* - To take decision ... *Performance indicator:* 'The Logistics team leader takes on logistics bottlenecks identified in the receipt and storage. He timely informs about decisions regarding adjustments in the schedule or workload to ensure continuity of work' *Competence:* • Think and work together with others - Consult and involve others ...	*Capabilities:* • C1: Define stages and to conduct operations within the logistics chain in accordance with the levels of service and quality established to track the goods. • C2: Calculate logistics costs in terms of the variables involved in the execution of the distribution service, to develop a budget of logistic service. • C3: To analyze and control the most common occurrences in the chain and logistics procedures to resolve them. *Assessment criteria:* • CE3.1 Explain the concept of unforeseen incidents and in providing a distribution service. • CE3.2 List the factors that could cause an impact in the logistics chain: loading and unloading, transportation and delivery of goods among others. • CE3.3 describe the most common incidents that may occur in the logistics chain and the ratios and indicators of quality of the process KPI (Key Indicators of the process) • ...

UK-Scotland	Slovenia	Poland	Germany
Example 1: National progression award in supply chain operations	**Vocational matura Logsticni Tehnik**	**Podstawa programowa technik logistyk And Świekatowski, Ryszard; Arciszewski, Włodzimierz; Program nauczania – technik logistyk 342**	**Kaufmann für Spedition und Logistikdienstleistungen**
Unit: Transportation of goods	Module: logistics freight flows	Unit in the core curriculum: Basics of transport and forwarding agency	Position in general training plan (work-based learning): Sending goods and transport
• Explain the key factors affecting the transportation of goods. *Performance Criteria:* (a) Describe the needs of internal and external customers in relation to transportation requirements. (b) Describe the role of the logistics company in meeting specified customer needs. (c) Explain the legal and regulatory requirements to provide a valid contract between appropriate organisations. ... • Explain the options available to an organisation for the transportation of goods. • …	Overarching aims: • identify the basic characteristics of the natural geographical and socio-geographical factors for the development of transport infrastructure, • use and orientate with the help of maps, • identify the importance of transport in Slovenia and the traffic flows, • … Professional competences: • knowledge of the maintenance elements of roads, railways and other infrastructure facilities of transport: • knowledge of planning and management of traffic flows, • legal sources on freight, • …	Aims: • classification of transport service • to plan work order for transport • to install and use computer programs to support transport processes • … Contents: • air transport • elements or rules of road traffic • to mark cargo • …	• Compare performance of transport modes (road, rail, air, water) • Assess adequacy of transport modes for specific goods, taking into account norms and regulations • Make use of the possibility to combine different modes of transport • Chose a transport route following economic and geographic criteria …
Example 2: SVQ 'Logistics pperations management' at level 3, Unit LOM1 Identify the logistics requirements of a supply chain	**Operational aims of the professional competence 'knowledge of the basic nature of geographical and socio-geographical characteristics'**	**Unit in the school curriculum: Basics of logistics**	**Unit in school-based training: 'process import orders'**
You will be able to: • Select suitable sources of information on the supply chain that are relevant to the organisation and its customers. • Identify the features and characteristics of the supplies flowing through the supply chain. • … *You will know and understand:* *Supply chains* • sources of information on the supply chain • how the supply chain operates • how supplies are moved through the supply chain • …	Informative aims: *The student:* • is aware of the different forms of the earth surface, • knows the role and importance of water transport, • knows the difference between weather and climate, Formative aims: • explains the importance of terrain in the development of transport network, • determines the importance of river and canal traffic, with a focus on the central European countries, • explains the importance of maritime transport in the world,	Special aims of education *(what the learner should be able to do after completion of the training program)* • the learner should indicate, explain cost of logistics, system of logistics, the role of information in logistics • … Teaching/Content *(what the graduate should know after completion of the training program)* • definition and terms of logistics, general aim and history of logistics • …	Objectives: The students advise clients on procedures for the import of goods. They execute the tasks for importing goods, taking into account the tax and customs regulations. They apply for custom authorisations on behalf of the client and provide all the documents requested. They charge the order and they ascertain that it has been executed accordingly. When working on documents and in corresponding, students make use of the English language.

Source: Cedefop, 2010b.