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## **Education and Training 2020 Work programme**

### **Thematic Working Group 'Assessment of Key Competences'**

#### **Literature review, Glossary and examples**

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## Introduction

This document supports the Commission Staff Working Document '**Assessment of Key Competences in initial education and training: Policy Guidance**'<sup>1</sup>, which is one of the documents accompanying the Communication from the Commission "**Rethinking Education: Investing in skills for better socio-economic outcomes**".<sup>2</sup>

Both the Staff Working Document and this literature review build on the work of the Thematic Working Group 'Assessment of key competences'. This group was established within the Education and Training 2020 work programme<sup>3</sup> to look into the role of assessment in implementing the 2006 Recommendation of the European Parliament and the Council on key competences for lifelong learning.<sup>4</sup> The group members, who represent a wide range of expertise in the field of school education and vocational education and training, undertook a number of peer learning activities and provided good practice examples that are presented amongst these documents.

This document has three sections. The first section presents the research and literature related to the assessment of key competences. The second section presents a glossary of the key terms used in this context. The third section supports the aforementioned Staff Working Document by providing three examples of the assessment of key competences from Austria, Lithuania and Ireland. These extended examples present the work on the development of the assessment of key competences in a wider policy context.

The list of members of the Thematic Working Group is in the Appendix.

This document was drafted by education consultant David Pepper, as part of the contract between ICF GHK Consulting and the European Commission.

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<sup>1</sup> SWD(2012) 371 final

<sup>2</sup> COM(2012) 669 final

<sup>3</sup> [http://ec.europa.eu/education/lifelong-learning-policy/framework\\_en.htm](http://ec.europa.eu/education/lifelong-learning-policy/framework_en.htm)

<sup>4</sup> For details, see [http://ec.europa.eu/education/school-education/competences\\_en.htm](http://ec.europa.eu/education/school-education/competences_en.htm)

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## I. LITERATURE REVIEW - ASSESSMENT OF KEY COMPETENCES

### 1. Background, scope and method

1. This literature review is intended to provide background evidence for the European handbook on assessing key competences. Given the definition of competence as knowledge, skills and attitudes applied appropriate to context in the European Reference Framework of key competences for lifelong learning, the scope of this literature review is:

*The assessment of key competences or similar learning outcomes that emphasise not only knowledge but also skills and attitudes in relation to contexts intended as preparation for lifelong learning.*

This review excludes e-assessment, which is the subject of a separate literature review for the handbook by the European Commission Joint Research Centre's Institute for Prospective Technological Studies ([Redecker, 2012](#)).

2. In order to better indicate the focus of the literature review, a working definition of assessment of relevant learning outcomes is necessary. The Cedefop glossary of terms ([2011b, p. 13](#)) defines assessment of learning outcomes as a:

Process of appraising knowledge, know-how, learning outcomes skills and/or competences of an individual against predefined criteria (learning expectations, measurement of learning outcomes). Assessment is typically followed by validation and certification.

With reference to the English-language literature, this source also comments that:

...‘assessment’ generally refers to appraisal of individuals whereas ‘evaluation’ is more frequently used to describe appraisal of education and training methods or providers.

Although assessment is one of several types of evidence source that can contribute to evaluations of institutions, programmes or systems, evaluation is defined as distinct from assessment. Evaluation is therefore beyond the scope of the handbook and this literature review.

3. The literature included in this review was identified according to background knowledge of the key sources on concepts and issues in educational assessment, and familiarity with the European and international policy literature and associated research. The review also included an internet-based search of academic reports, journal articles and books using the following terms:

- key competencies, assessment, education
- competences, assessment, education
- competence-based, assessment, education
- competency-based, assessment, education
- cross-curricular, assessment, education
- thinking skills, assessment, education.

4. This report on the literature review is structured as follows:
- Background, scope and method
  - The importance and challenge of assessing key competences
    - Background to key competences and their assessment
    - The challenge of assessing key competences
  - Developing assessments for key competences
    - Making key competences assessment ready
    - Using assessment to report learners' key competences
    - Using assessment to develop learners' key competences

## 2. The importance and challenge of assessing key competences

### *Background to key competences and their assessment*

5. A major report for the European Commission ([Gordon et al., 2009](#)) traces the development of policies that relate to key competences. It notes that the key competences expressed in the European Reference Framework built on earlier developments by UNESCO and the OECD, which also influenced some Member States. The work by UNESCO was under the auspices of the International Commission on Education for the 21<sup>st</sup> Century led by Jacque Delors in the mid-1990s ([Delors, 1996](#)). Although the report of the Commission does not explicitly refer to competences, it identifies a need to organise learning to meet the challenges of the 21<sup>st</sup> Century according to four pillars: learning to know, learning to do, learning to live together and learning to be. Gordon et al (2009) found the UNESCO four pillars and the EU key competences to have the same emphasis on all-round development and continued learning. They also found that many of the same elements are embedded in both of these sets of broad learning outcomes.
6. Soon after the UNESCO work, the OECD's Definition and Selection of Competencies (DeSeCo) project began. This project took place between 1997 and 2002 with the involvement of 12 countries, several of them Member States of the EU. DeSeCo provided some of the groundwork for the OECD's PISA project, which also prefers the term 'competencies' to competences.<sup>5</sup> DeSeCo defined competencies as 'the ability to successfully meet complex demands in a particular context... the mobilization of knowledge, cognitive and practical skills, as well as social and behavior components such as attitudes, emotions, and values and motivations' ([Rychen & Salganik, 2003](#)). This OECD definition is more discursive than the EU definition but contains the same essential elements: knowledge, skills and attitudes. It also seems to share the view that learners need to deploy different combinations of these elements for success in any context. DeSeCo identified three overarching key competencies: using tools interactively, the ability to relate well to others, and acting autonomously. These transversal competencies are framed quite differently from the first three EU key competences, which resemble content domains (ie traditional subjects) but there are points of

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<sup>5</sup>As in the European Reference Framework of key competences, 'competences' is used throughout this literature review. However, 'competencies' is used with reference to OECD sources and other specific sources which prefer this term.

comparison with the other five EU key competences, which are more transversal (digital competence, learning to learn, social and civic competences, sense of initiative and entrepreneurship, cultural awareness and expression).

7. The OECD's DeSeCo project provides some insights for the assessment of key competences. It cautioned that competence is a 'holistic notion' and 'therefore not reducible to its cognitive dimension' (Rychen & Salganik, 2003). The assessment of not only knowledge and skills but also the attitudes that support their development and application appropriate to the context is therefore essential. In keeping with the EU key competences, DeSeCo asserted that the 'constellations' of key competencies will vary according to the context. This also has implications for assessment: 'it is important for assessments to explore the patterns that make up these constellations, the interplay among the multiple, interrelated key competencies' (Rychen, Salganik, & McLaughlin, 2003, p. 206). Assessments of key competences therefore also need to address the range of contexts in which the competences are expected to be applied. OECD assessments have arguably continued to focus mainly on competencies relating to using tools interactively but DeSeCo sought to 'provide a way to situate assessments and existing measures within a larger conceptual context and to recognize the value but also the limitations of current assessments' (Rychen & Salganik, 2003).
8. Gordon et al (2009) gathered information from the 27 EU Member States about their implementation of approaches to education and training that reflected the intentions of the European Reference Framework. The authors found that most of the Member States had formulated, or were in the process of implementing, policies that would 'move their school systems from being predominantly input led and subject-oriented towards curricula which include competences, cross-curricular activities, active and individual learning, as well as a focus on learning outcomes' (p.79). The authors also identified 'an overall architecture of implementation policies' with three factors, which were: a new curriculum, guidelines and textbooks/documents; new assessment tools for learning outcomes and evaluation tools for the implementation; and, training schemes for teachers and senior managers (p.101). Assessment was therefore identified as having a crucial role in the development of learners' key competences.
9. Cedefop conducted two comparative studies on 32 European countries in parallel. One examined the degree to which curricula in initial VET (vocational education and training) were being revised and reshaped around learning outcomes. The other examined how learning outcomes were being assessed in initial VET. Cedefop concluded that the introduction of new outcome-oriented curricula in many European countries had encouraged policy makers and practitioners to consider the effectiveness of present assessment practices. This meant a broadening of assessment not only in terms of purposes and methods but also in terms of the learning outcomes that are included. Thus formative assessment, skills demonstrations, e-portfolios and simulations of real work settings were more prevalent in initial VET than previously. The evidence pointed to the need to design assessment tools and curricula together but also to permit scope for the validation of non-formal and informal learning (Cedefop 2012, Psifidou 2012)<sup>6</sup>.

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<sup>6</sup> See also outcomes of Cedefop 3<sup>rd</sup> International Workshop on *Curriculum Innovation and Reform: Changing Assessment to Improve Learning Outcomes*, 26-27 April 2012, Thessaloniki <http://events.cedefop.europa.eu/curriculum-innovation-2012/>

10. The wider view from the assessment literature is that, depending on the particular policies and practices that are adopted, assessment issues are central to education and assessment can strongly influence teaching and learning ([Black, 1998](#); [Koretz, 2005](#); [Stobart, 2008](#)). The negative side of this influence is that:

- If only a few subjects are assessed, it can narrow the focus of the curriculum and lead to the neglect of other subjects.
- If only limited aspects of these subjects are assessed, it can distort them too.
- If only knowledge is assessed, then the development of skills and attitudes is at best incidental.

11. However, the positive side is that:

- Rather than only the learning that is easily assessed, assessment can tell us about the learning that we agree is important too.
- Assessment can lead to increased time and effort spent on what we agree is important, such as developing key competences.
- Assessment can support effective changes not only in what is taught but also how it is taught, and consequently what is learnt and how it is learnt.

12. Although assessment is generally seen as having the potential to either support or undermine learning intentions and seen as fundamental specifically to the development of key competences, there is evidence that assessment policies and practices need more attention from Member States. With reference to vocational education and training Cedefop ([2010](#)) found that whilst their findings from nine EU Member States could:

...demonstrate that the shift to outcome-based approaches [such as key competences] has had some effects on assessment methods and policies, the evidence for changes in practices is still scarce (p.125).

13. More broadly, with reference to the whole education and training systems of the 27 Member States, a joint progress report of the European Council and the Commission (2010) had found that:

A large number of countries are introducing reforms that explicitly use the Key Competences framework as a reference point. Good progress has been made in adapting school curricula. But there is still much to be done to support teachers' competence development, to update assessment methods, and to introduce new ways of organising learning (p.3).

14. This literature review therefore focuses on assessing key competences but also includes insights into supporting changes in teaching and the organisation of learning.

### *The challenge of assessing key competences*

15. One way of beginning to explore the challenge of assessing key competences is through the educational assessment literature on validity. In educational assessment, validity is a central concept because it provides an overarching criterion for evaluating assessments. It is therefore the foremost technical consideration for any assessment, including the assessment of key competences. A broad conception of validity has been gradually accepted as unifying the various earlier conceptions it encompasses (Brennan, 2006a). Consequently, the frequently used definition for this broad conception describes validity as:

...an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the *adequacy* and *appropriateness of inferences and actions* based on test scores or other modes of assessment (Messick, 1989, p. 13, italics in original).
16. In response to this definition, a general methodology for validation therefore begins with an explicit statement of proposed interpretations and responses based on assessment results (Kane, 2006). In the case of the key competences, the proposed interpretation could be the extent to which each individual has developed the competences that ‘all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment’ (European Communities, 2007). In the longer term this means developing indicators for these outcomes. Indeed, there is already research on the development of a European indicator for active citizenship (Fredriksson & Hoskins, 2008). However, in the short-term, the key competences that provide a basis for these outcomes are already identified in the European Reference Framework. The next step is therefore to make an explicit statement of what it means to be competent at given levels of learning, specifying the learning outcomes associated with each key competence and the range of contexts in which they should be developed and therefore assessed. This is addressed in the section on *Making key competences assessment ready*.
17. The emphasis of the validity definition is, secondly, on the validation of proposed responses to assessment results. The responses relate to what are commonly referred to as ‘assessment purposes’. Educational assessments potentially serve many specific purposes and the distinctions between these purposes are often subtle. Although there is some debate in the academic literature, the two main purposes of assessment are generally identified as formative and summative (Newton, 2007). Formative assessment is often called ‘assessment for learning’ because it is concerned with using assessment information to promote an individual’s learning during a period of instruction. This is distinguished from summative assessment or ‘assessment of learning’, which summarises an individual’s learning at the end of a period of instruction. From the earliest documented use of ‘formative’ and ‘summative’ in relation to assessment, it is clear that the terms referred to the use of assessment information rather than the assessment process itself (Black & Wiliam, 2003). Thus test results or teacher observations could potentially be used for summative or formative purposes. However, in accordance with validity, it is important that the design of an assessment and the use of information from that assessment are consistent with one another. Clearly, assessments designed for key competences need to serve both uses so that learners’ key competences are firstly developed and secondly reported.
18. Although some authors also identify an evaluative purpose distinct from the formative and summative purposes of assessment (eg Pellegrino et al, 2001 op. cit. Newton, 2007), the introduction to this literature review detailed how assessment is generally distinguished from evaluation. Yet the results of summative assessments for individual learners may be



aggregated across a sample or a population so as to contribute to evaluations (Harlen, 2007). The wide dissemination of the results of such evaluations have a critical role to play in informing the refinement of policies and practices from early in the process of implementing changes to assessment policy and practices, including during initial piloting phases (Fullan, 2001). However, to avoid compromising their integrity, it is important to ensure that formative assessments, summative assessments and the evaluations to which they contribute are aligned in overall systems (Black & William, 2003). Indeed, this is the focus of the OECD review on assessment and evaluation frameworks launched in 2009. A recent education working paper for the OECD emphasises coherence between curricula, assessment and evaluation (Looney, 2011). Furthermore, a recent research paper from Cedefop argues that successful curriculum reform is dependent upon the alignment of learner assessment systems to the requirements of new outcomes-oriented curricula (Cedefop, 2010). For the scope of this literature review, this coherence or alignment would mean focussing an overarching curriculum, assessment and evaluation framework on key competences. In support of such a framework, the need for intensive capacity building relating to the key competences of teachers and other professionals should be added (Halász & Michel, 2011 and Psifidou, 2011a p.280-281).

19. The broad conception of validity as a criterion for evaluating assessments subsumes other important but narrower criteria, such as reliability, comparability, utility and equity (all of which are identified in the literature highlighted by Morris, 2011). The reliability criterion requires more attention. Reliability is ‘...often defined as, and measured by, the extent to which the assessment, if repeated, would give the same result’ (Harlen, 2007, p.18). Although validity and reliability are often seen as being in tension with one other, reliability is an aspect of the broad conception of validity. Thus whilst an assessment can be reliable without being valid (simply put, it could reliably measure the wrong thing twice), it cannot be valid without being reliable (if it only measures the right thing once, the assessment is not much use either). Some examples relating to key competences illustrate this.
20. A test can be made more reliable by limiting its question types and response formats, making it straightforward for learners and assessors to interpret and respond. However, such tests would fail to simulate the circumstances of a wide range of real-life contexts and therefore lack validity for inferences about learners’ development of the key competences they need for lifelong learning. Conversely, teachers’ judgements of learners’ key competences may widely differ and therefore seem unreliable. Since teachers apparently hold different conceptions of key competences, the extent to which the assessment is valid for inferences about learners’ key competences is therefore in question. In practice, the balance between reliability and overall validity is struck according to the assessment purpose. Thus summative assessments emphasise reliability, assessing a more limited number of performances and range of the curriculum, and formative assessments emphasise overall validity, assessing more performances in a wider range of contexts. Methods of improving both reliability and validity in relation to specific assessment methods are considered in the following section, which begins with a focus on defining the learning outcomes to be assessed.
21. An additional, broad criterion for the evaluation of assessment systems as a whole is public trust. It is crucial for the users of assessment information to have well-informed confidence in the system and for assessments, particularly qualifications, to have currency and credibility. Newton (2005) argues that it is important for assessment agencies to raise awareness of the unavoidable measurement inaccuracy in any assessment and to ensure that public expectations are realistic and can be met, thus promoting responsible use of assessment and confidence in the assessment system.

### 3. Developing assessments for key competences

22. This section firstly reports on the literature that shows how key competences can be specified in learning outcomes that provide a basis for teaching and learning, including assessment. The main finding is that whilst all elements of key competences need to be specified, a balance should be struck between the amount of specification and the scope for the judgement of teachers, assessors and indeed learners in specific contexts. This should help to preserve the holistic nature of key competences. The section secondly reports on the literature relating to assessment methods for key competences. The main finding is that a range of methods are needed to enable learners to develop and demonstrate their key competences and a range of sources and types of information are needed too.

#### *Making key competences assessment ready*

23. Gordon et al's (2009) report for the European Commission found that in order to assess key competences, it would first of all be necessary to operationalise them for assessment. This would mean taking the broad definitions of key competences in the EU Reference Framework or national documents and developing them into more specific learning outcome that would be ready for assessment. Several theoretical or policy perspectives, supported by empirical research, identify a need to specify learning outcomes in order to provide a basis for teaching, learning, assessment and evaluation. Firstly, there are three theoretical perspectives:
- The psychometric perspective emphasises the need to define the scope of the assessment domain, its relevant constructs and the proposed interpretations of results (Brennan, 2006b). Assessment instruments (eg tests) can then be developed to collect only information that is relevant (thereby avoiding threats to validity called construct-irrelevant variance and construct under-representation).
  - The assessment for learning literature emphasises the need for both teachers and learners to develop a shared understanding of intended learning outcomes and how assessment criteria will be used to judge individual progress (Black & William, 1998b; Sadler, 1987). The emphasis is on promoting learning.
  - The specification of learning outcomes so that they can be assessed is central to the competence-based assessment literature relating to vocational education and originating in the USA in the 1970s (Wolf, 2001). The emphasis is generally on identifying competence for economic roles but could cast more broadly to encompass social and civic roles too.
24. To a greater or lesser extent, these theoretical perspectives have influenced three overlapping international policy perspectives, each based on international research:
1. There has been international interest in the specification of learning outcomes in competence-based 'standards' since the 1980s (Mays, 1995), which focus assessment and evaluation in order to direct and improve education systems (Looney, 2011). There is a similar emphasis in the literature on quality assurance of education and training providers (Visscher et al, 2009 and Cedefop, 2009a) and in some sector-specific literature concerned with enhancing assessment practices (Price, O'Donovan, Rust, & Carroll, 2008).
  2. Underpinned by international research, the European Qualifications Framework (EQF) places an explicit emphasis on using learning outcomes as a basis for comparisons of learners' qualification levels rather than only using learning inputs such as attendance and time in formal education. In addition to qualification equivalence and mobility, one further

benefit is the greater transparency of education and training systems (Cedefop 2011c; Leney, Gordon, & Adam, 2008).

3. The third policy perspective provides the basis for this literature review and handbook: the development of frameworks for key competences, competencies or other holistic learning outcomes needed by individuals and society as a whole. The work of UNESCO, the OECD and the EU in defining and selecting these holistic outcomes was highlighted in the previous section.
  
25. The specification of learning outcomes can therefore provide a basis for focussing teaching and learning, including assessment, on creating opportunities for learners to develop and demonstrate their key competences. For assessment validity it is important to ensure that:

‘...the assessment concerns all aspects – and only those aspects - of students’ achievement relevant to a particular purpose. Including irrelevant aspects is as much a threat to validity as omitting relevant aspects. *Thus a clear definition of the domain being assessed is required, as is adherence to it*’ (Harlen, 2007, p.18, italicised for emphasis).
  
26. This quote highlights not only the need for learning outcomes to be clearly specified but also for these learning outcomes to be the sole focus of the methods used to assess learners’ key competences. If the range of specified learning outcomes is not assessed, construct under-representation may result. That is to say, we will not know enough about the different aspects of each learner’s key competences. If learning outcomes other than the ones that were specified are assessed, construct-irrelevant variance may result. What we think we know about learners’ key competences is then actually affected by ‘noise’ from irrelevant information. A typical example is a student who does less well than expected in a mathematics test because they are unable to read the questions; although the assessment was intended to assess the student in mathematics, it assessed the student in reading. These issues affect not only assessment validity but also equity, notably the equity of assessments for learners who are from minority groups or who have learning difficulties or disabilities.
  
27. Assessment methods can be developed or modified to ensure that when a disability is not relevant to a learning outcome, then it is not assessed. Many countries allow for a written test to be presented to sensory-impaired students in different ways such as Braille, large print, via a reader, audio playback or, for computer-based assessment, screen-reading software. Then students may respond via a writer, audio recording or a sign-language interpreter, with additional time to allow for these arrangements (Pepper, 2007). These arrangements can avoid compromising validity when the assessment is not intended to assess communication competence or when a broader conception of communication competence is used. In fact, narrowly-defined communication competence could be inequitable. The key competences place special emphasis on everyday contexts, the very contexts in which learners might be expected to have access to, for example, screen-reading software. The learning outcomes would therefore need to accommodate communication using different media. There is, however, a more general need to accommodate the different backgrounds and circumstances of all students. However, since it is impossible for assessments to be acultural, it is important: for the learning outcomes on which assessments are based to be clearly articulated; for assessment methods, question contexts and answer formats to be justified; and for the assessment process to be open and transparent (Stobart, 2008).
  
28. Returning to the UNESCO, OECD and EU work, a further point on learning outcomes is also important. This work did result in frameworks providing broad definitions of the domain to be

assessed. However, these definitions were intended to be interpreted and developed into more detailed learning outcomes relating to specific contexts. Thus Gordon et al (2009) found several examples of EU Member States interpreting the European Reference Framework of key competences in the context of their own education systems, sectors and levels. Pepper (2011) reviewed and updated this finding, confirming the trend for Member States to break key competences down into smaller units such as sub-competences, learning objectives, learning outcomes and assessment criteria relating to specific contexts within, across or beyond subject boundaries. However, these sources indicate that the specification of learning outcomes tended to focus on the application of the three 'traditional' key competences (communication in the mother tongue, communication in foreign languages, mathematical competence and basic competences science and technology) in contexts limited to their most closely-related subjects. Although the remaining five 'transversal' key competences were widely seen as relevant, they were less often specified in learning outcomes. Similarly, based on Member States' national reports, the European Commission had itself found that, in comparison with subject knowledge and skills, the challenge of assessing key competences across the curriculum was 'acute and ongoing' (European Commission, 2010).

29. These findings were in tune with a report for the OECD that reported the results of a questionnaire survey on '21<sup>st</sup> century skills and competencies' (Ananiadou & Claro, 2009). 17 countries responded to the questionnaire, including 10 EU Member States (Austria, Belgium-Flanders, Finland, Ireland, Italy, the Netherlands, Poland, Portugal, Slovakia and Spain). The survey focused on 'transversal skills or competencies', including creativity, innovation, critical thinking, problem solving, decision-making and communication. Although formulated differently, these terms recall important elements of the EU key competences. However, the authors found that few countries appeared to have either specifically defined these terms or developed clear assessment policies in relation to them. These absences seemed to be closely related: 'Rigorous assessment methods cannot of course be developed without clear definitions of the skills and competencies in question' (Ibid., p. 16).
30. Although there is a strong case for the specification of key competences in learning outcomes, there is also a need to balance the amount specification that assessors are required to work with. Thus the report from Gordon et al (2009, p.146) found that:

There were a number of examples of Member States adopting this type of approach to key competence assessment. The challenge for them may be to make this assessment manageable without reducing learning to a series of narrow targets that militate against key competence acquisition.
31. The vocational literature on competence-based education has long seen competence-based assessment as focussed on learning outcomes. Competence-based assessment has been defined as 'a form of assessment that is derived from a specification of a set of outcomes; that so clearly states both the outcomes -general and specific- that assessors, students and interested third parties can all make reasonably objective judgements with respect to student achievement or non-achievement of these outcomes' (Grant et al, 1979 op. cit. Wolf, 2001). However, recent literature reviewing implementations in different countries cautions that over-specification of learning outcomes should be avoided. Over-specification of learning outcomes in the South African national qualifications framework has become a case in point (Allais, 2007).
32. In Europe, an analysis of the implementation of the EQF at national level found that when learning outcomes are formulated operationally for specific occupations, there

are difficulties in matching them to the generic descriptors of the EQF (Psifidou 2011b). High prescription can increase the reliability of assessment and the consistency of teaching and thus help to ensure that VET provision does reflect the competences required. However, these kinds of prescription can have negative effects: they can lead to excessive complexity, overly instrumental approaches to teaching and learning (reducing teacher autonomy) and a lack of relevance for particular learners and particular employers by reducing the scope for tailoring at local level (Cedefop 2012).

33. More generally, there are two major issues. Firstly, when learning outcomes are over-specified, holistic competences are reduced to atomised tasks. Teaching, learning and assessment is then characterised by the following of scripts provided by long check lists of actions and behaviours (Kerka, 1998; Wolf, 2001). However, competence-based education should be 'more than an effort to describe or list educational and behavioral objectives'. Rather, when competences are specified, it should be the case that 'the whole is greater than the sum of the parts' (Council on Education for Public Health, 2011, Competencies and Learning Objectives. Washington, p.1). Secondly, the need for assessment to be relevant to complex contexts, including occupational contexts and social contexts more generally, means that assessors need to be able to exercise their judgement in any given set of circumstances (Cedefop, 2010). Wolf (2001, p.9) argued that:

The inherent variability of the contexts in which competence is tested and displayed means that assessors have to make constant, major decisions about how to take account of that context when judging whether an observed piece of evidence "fits" a defined criterion. In other words, they operate with a complex, internalised, and holistic model-not a simple set of descriptors lifted from a printed set of performance indicators.

34. Thus rather than a single acceptable outcome, performance can be demonstrated in different ways in different contexts according to individual attributes (Kerka, 1998). The exercise of assessors' judgement is therefore unavoidable and, in fact, desirable. Training and development for a shared understanding and consensus amongst assessors therefore seems essential. In this way, outcome specification and assessor judgement can be balanced to ensure the validity (and reliability) of assessments.
35. This training for teachers can mirror the key competences for learners but reflect the teaching context. Thus a recent Cedefop (2011a) briefing note asserts that teachers need 'not only the right knowledge and skills, but also the appropriate attitudes to bring about curriculum change'. Furthermore, 'systematic upskilling for teachers in new pedagogy and assessment methods, can extend beyond those directly responsible for assessments' (p.4). Fullan (2001) argued that the attendance of head teachers, principals or managers in training sessions can signal the importance of changes in policy – and that changes in practices are expected. However, specific training for senior managers can enable them to lead the development an organisation-wide assessment policy. This policy can encompass a range of assessment techniques with purposes that are clear to teachers and learners (Harlen & Deakin Crick, 2003).
36. The precise balance between specification of learning outcomes and the judgement of assessors will also partly depend on the assessment purpose. Cedefop (2011b, p.7) argues 'that the way in which learning outcomes are expected to be used, affects the way in which they are formulated' and that 'the key attribute of a learning outcome is that it is expressed in

a level of detail that makes it fit for purpose'. Thus the learning outcomes for summative assessment for a qualification will be more tightly specified than the learning outcomes for formative assessment in the school curriculum. Regardless of the degree of specification, it should be possible to trace the outcomes back to the broad domains defined in the European Reference Framework, or in national documents, and their holistic view of learning. Some examples from the research literature on learning outcomes for specific key competences follow.

Figure 1: Examples of learning outcomes for key competences

**The Framework for a European Test to Measure Learning to Learn (Fredriksson & Hoskins, 2008)**

The Framework model for learning to learn is based on three dimensions.

An affective dimension with three sub-dimensions:

- Learning motivation, learning strategies and orientation towards change
- Academic self-concept and self-esteem
- Learning environment

Cognitive dimension with four sub-dimensions:

- Identifying a proposition
- Using rules
- Testing rules and propositions
- Using mental tools

A meta-cognition dimension with three sub-dimensions:

- problem solving (metacognitive) monitoring tasks
- metacognitive accuracy
- metacognitive confidence.

**Using learning outcomes. European Qualifications Framework Series: Note 4 (Cedefop, 2011)**

In relation to curricula and training programmes, Cedefop (2011c, p.24) offers the following advice on constructing learning outcomes:

'Learning outcomes in curricula [and training programmes] usually begin with the phrase:

*...The learner is (or will be) able to...*

This phrase is followed by an action verb so that students are able to demonstrate what they have learned. Words such as 'know' or 'understand' do not help with this demonstration of learning and are therefore usually avoided because it is not clear to the learner the level of understanding or amount of knowledge required.

Different verbs can be used to demonstrate different levels of learning... At a basic level the learning outcomes may require learners to be able to define, recall, list, describe, explain or discuss. For a more advanced programme the learners may be expected to be able to formulate, appraise, evaluate, estimate or construct. The verb will usually be followed by words indicating on what or with what the learner is acting and the nature or context of the performance required as evidence that the learning was achieved. These additional words also indicate the level of learning achieved.'

This extract uses the word *demonstrate* and the source also offers examples where this verb is used in learning outcomes. This verb has the benefit of indicating that the assessment method

should be linked to the learning outcome, providing the learner with the opportunity to demonstrate their competences through the information that is gathered and interpreted for assessment purposes.

#### *Using assessment to report learners' key competences*

37. This section focuses on assessment for the summative purpose – or using assessment to report the competences that learners have developed by the end of a defined period of learning. In the literature, an important distinction is made between internal and external summative assessment. Internal summative assessment refers to uses that are essentially internal to education and training providers, such as providing teachers, parents and students themselves with information. External summative assessment refers to uses that are essentially external to the provider, such as certification, selection and accountability (adapted from Harlen, 2007).
38. External summative assessment such as standardised tests can be administered on a limited number of occasions and can relate to a limited range of contexts for each student. It can therefore assess a limited range of knowledge, skills and attitudes. Nonetheless, it may contribute to the assessment of key competences. This is the focus of this section. Internal summative assessment conducted by teachers themselves can take place regularly and use a variety of sources. It can therefore assess a wider range of learning outcomes. Under certain conditions, assessment by teachers can meet requirements for comparability (essentially, inter-rater reliability) and overall quality (ie validity), whilst developing learners' key competences. This is addressed in the subsequent section on performance-based assessment.

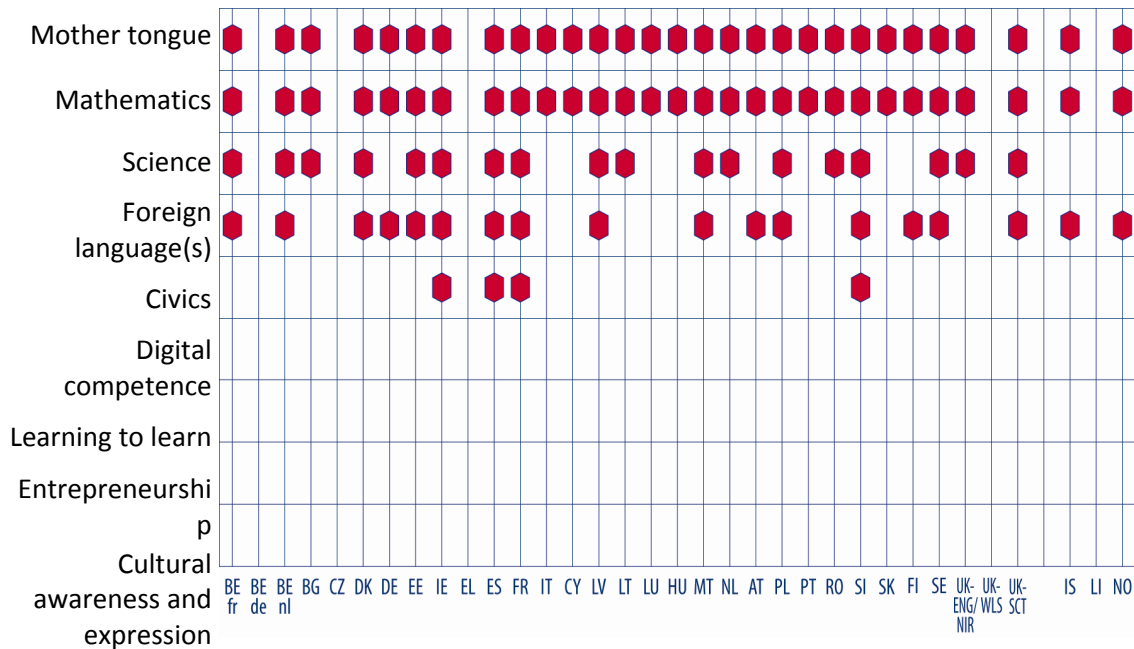
#### *Standardised tests and surveys of competences*

39. In relation to external summative assessment, Eurydice (2009) found that, of the eight key competences:

'...only three, namely communication in the mother tongue, communication in foreign languages, and mathematical competences and basic competences in science and technology, can be directly linked to individual subjects... these three competences are the ones most commonly assessed in national tests. By contrast, in many European countries the remaining key competences such as 'learning to learn' or social and civic competences, which usually relate to more than one subject, are not at present generally assessed in national tests'.

40. The following figure was provided by Eurydice specifically for this literature review. It is based on national Eurydice Unit responses to requests for information. It summarises the current scope of national testing in Europe (ISCED levels 1 and 2). These national tests are generally summative in nature but often feed into national or local evaluations.

Figure 2: National standardised tests of key competences in compulsory education, 2008/09<sup>7</sup>



Source: Eurydice.

■ National test

41. It will be noted that there are particularly few, if any, Member States whose national testing systems were reported as assessing the last four key competences: learning to learn, social and civic competence, sense of initiative and entrepreneurship or cultural awareness and expression. A note of caution should be struck: these competences may be implicitly assessed through national tests, or explicitly assessed through methods other than these tests. However, national testing systems tend to reflect the priorities of education systems and the evidence suggests that, although highly valued, these four key competences are much less widely assessed. In fact, the focus of national testing is mostly limited to mother tongue and mathematics competences. This section provides some examples for the assessment of a wider range of competences using standardised tests, sometimes in combination with other methods.

42. Researchers at the University of Amsterdam developed a cross-curricular skills test to assess the 'competence' of students aged 15-16. The test was designed to assess 'cross-curricular skills', defined as general skills that could be taught and practiced in different disciplines. Eight cross-curricular skills were selected for assessment and there are several points of similarity with the EU key competences, particularly with the social and civic competences:

- Conducting observations;
- Selecting and ordering information;
- Summarising and drawing conclusions;
- Forming opinions on social issues;
- Recognising beliefs and values in opinions and actions of oneself and others;

<sup>7</sup> Eurydice (2009)



- Distinguishing opinions from facts;
  - Working together on assignments;
  - Evaluating the quality of one's own work.
43. The test consisted of 56 multiple-choice items, which the researchers acknowledged is 'an item-format that is not a customary one for measuring general skills' (Meijer, Elshout-Mohr, & Wolters, 2001, p. 79). The test was administered to 465 students in a pilot study and 9,000 students in the main study. The researchers concluded that the test was a valid and reliable test for cross-curricular skills. The finding that students acknowledged their feelings when responding to the questions is relevant to the attitudes element in key competences. However, the authors acknowledge some limitations. They point out that the test assesses only some skills that might be termed cross-curricular. They note that, for example, effective communication is not included in their assessment. To this limitation it could be added that, since effective communication is likely to be needed in any real-life context, its absence may reduce the validity of the test for inferences about preparedness for lifelong learning. However, the authors accept that, whilst a multiple-choice test is practicable for large-scale surveys, alternative formats such as portfolios and authentic performance tests may be preferred in 'classroom settings'. Indeed, in some real-life contexts there is a limited range of distinct choices. In other real-life contexts, one aspect of competence is making sense of complexity and identifying potential alternatives from amongst an infinite number. To some extent, the authors respond to these limitations by suggesting that:
- 'Ideally, users should have a complete set of assessment instruments at their disposal with different values on at least such factors as 'content' (covered skill area), 'format' (multiple-choice, performance measure, self report), and 'practicability' (Meijer, et al., 2001, p. 104).
44. In a review of the literature, Morris (2011) found wide agreement that standardised tests can only provide a limited picture of student performance. This is because tests can only:
- Assess performance infrequently (without seriously reducing instruction time)
  - Sample part of a domain at any one time (without becoming a test of endurance)
  - Reproduce a limited range of contexts authentically and only require certain response types (though e-assessment offers some hope for context simulation and dynamic interaction).
45. Thus when tests are narrow but high stakes and motivate the behaviour of teachers and learners, they can serve to reduce the breadth and depth of the curriculum – and reduce the opportunity for students to develop and demonstrate their competences. Since well-designed tests can, however, still provide part of the picture of student performance, they can usefully be combined with other methods of assessment. Employing multiple measures of students' learning outcomes, potentially including tests, therefore 'reduces the risk of making incorrect decisions... improves the validity of the system, and reduces the likelihood of excessive narrowing of curriculum' (Ibid., 2011, p.44). The following paragraphs discuss the separate and combined use of cross-curricular or competence-based tests and other instruments for the assessment of key competences.
46. Whereas the organising concept of the IEA's international surveys of reading (PIRLS) and mathematics (TIMSS) has been the school curriculum, the OECD's PISA surveys have sought to assess the competencies of students aged 15 in reading literacy, mathematical literacy and

scientific literacy. Other assessed domains include problem-solving and financial literacy. The frameworks for each of these domains emphasise problem-solving in real-world contexts and tests are employed to assess students in each domain. The test items have a range of formats including open-constructed response (requiring details or explanation), closed-constructed response (often numerical) and selected-response (multiple choice) items. Some selected-response items are complex multiple choice items, where more than one response may be correct, which potentially more closely resembles real-life conditions in some contexts. As a whole, the items present students with different types of context. In mathematics, for example, these are individual, societal, occupational or scientific contexts (OECD, 2010). This provides some insight into how mathematics, for one, might be assessed as a competence across the curriculum (or even beyond the traditional curriculum). Items in each of the domains present students with varying degrees of complexity, sometimes requiring multiple steps, as might be the case in real contexts. Similarly, students are frequently asked to make sense of a significant amount of information presented as text or in graphics. This reading demand introduces another sense in which the items require cross-curricular key competences. However, such combined demands need to be varied in order to gain a clear picture of each learner's specific key competences.

47. In addition to tests, the PISA surveys have employed questionnaires to survey students' attitudes to learning. Although attitudes are conceptualised as explanatory variables for performance, the surveys may nonetheless provide some insights for the assessment of attitudes as learning outcomes in their own right. However, other literature indicates that questionnaires have both some potential and some limitations for the assessment of different types of attitudes. The European framework for learning to learn also employed both tests and questionnaires. Affective, cognitive and metacognitive domains and sub-domains comprised the European framework. These were elaborated from earlier assessments developed in Finland, the Netherlands (the test detailed earlier in this section), Spain and the UK. Whilst the cognitive domain was generally assessed by means of tests, the affective and metacognitive domains were generally assessed through questionnaires. The European framework for learning to learn adopted the same approach. Its tests and questionnaire were piloted with students aged 14 in 8 European countries in 2008. However, researchers involved in the piloting identified the assessment of conceptually distinct but, in practice, highly interrelated domains as problematic:

One of the points raised has been that the most difficult and lengthy cognitive items were also testing the affective aspects of perseverance and resilience with many students simply giving up or not even trying to answer these questions. This highlights the difficulty of trying to separate cognitive and affective aspects of learning (Hoskins and Frederiksson, 2009, p.29).

48. No specific information about the functioning of the questionnaires was, however, reported. The initial results were simply reported as indicating that all aspects of the test and questionnaire instruments required further research-informed development. However, analyses of results from PISA and some academic literature provide general insights about the use of questionnaires to assess students' attitudes.
49. The PISA student questionnaires have included items relating to students' motivation to learn, their beliefs about themselves as learners and their use of self-regulatory learning strategies. These are self-report items reliant on students' accurate recall and reporting of their thoughts and actions. These items do not provide direct measures and students' responses may differ from what they actually think and do. This could help to explain the low correlation between students' reported use of self-regulated learning strategies in the PISA questionnaires (eg I try

to figure out which concepts I have not understood properly) and their competence as assessed in the PISA tests (OECD, 2004). Self-regulated learning, entailing students' monitoring and control of their own learning practices and outcomes, is arguably central to learning to learn competence and lifelong learning more generally (Dignath & Büttner, 2008). The issue is that direct measures such as interviews and observations are not practical for a large-scale survey like PISA (OECD, 2004). However, after three decades of research on self-regulated learning, a review of the academic literature found that a combination of these direct measures are the very ones necessary for valid measurement of students' use of these learning strategies (Boekaerts & Corno, 2005).

50. For assessment purposes, the self-regulated learning research therefore suggests a higher profile for classroom and workplace observation and dialogue than for questionnaires and tests. Furthermore, if self-regulated learning implies self-control informed by accurate self-monitoring, then an important role for self-assessment is also implied. Moreover, this need not be limited to formative assessment. Comparison of self-assessments and expert assessments yields useful information about the apparent accuracy of students' self-monitoring of their learning outcomes (Winne, 1996). Students have little to gain from inflating their self-assessments when they know these will be compared with expert assessments and judged accordingly. As a result, it may be possible to combine the use of questionnaires and tests to assess this specific aspect of learning to learn competence. Comparison of student performance on self-efficacy questionnaire items (when conceptualised as a task-specific judgement of one's own competence) and competence-based test items appears to be a particularly promising path for exploration (Greene & Azevedo, 2007). In fact, self-efficacy items have been included in PISA questionnaires and have even been the focus of a recent PISA report and policy briefing (OECD, 2011). This is one possible way in which self-assessment may contribute to summative assessment. Self-assessment for the formative purpose will be further explored in the next section in tandem with peer assessment.

#### Performance-based assessments of competences

51. In a review for the OECD, Looney (2011) reports that performance-based assessments can include tasks such as presentations, group work and projects. To this list might be added: portfolios, reflective diaries, role plays and interviews. One benefit of performance-based assessments is that they can be very effective at encouraging and capturing both learning processes and outcomes in relation to complex tasks and demanding contexts. Their overall validity for the formative or summative assessment of key competences can therefore be high, and they can serve both purposes (though formative assessment is the focus of the next main section). This overall validity contrasts with test items that provide only discrete tasks, lacking a relevant context for lifelong learning. However, the reliability of performance-based assessments, particularly inter-rater reliability between the judgements of assessors needs to be addressed; some of the literature shows how this can indeed be addressed.
52. One important form of performance-based assessment used in countries in and beyond Europe is portfolio assessment (Pepper, 2011). Simon and Forgette-Goroux (2000) provide a useful summary of ways in which the portfolio has been conceptualised in relation to learning:  

McLean (1990) referred to it as a systematic and cumulative folder of learned material. Arter & Spandel (1992) subsequently defined the portfolio as a collection of significant works accomplished by the student that gives an overview of his or her efforts, progress or performance in one or several subjects. Linn & Baker (1992)

added that the portfolio should demonstrate both the student's progress and his or her accomplishments.

53. Simon and Forgette-Goroux (Ibid.) identify portfolios as having traditionally played an important role in the visual arts, languages and writing. They suggest that the main attraction of portfolio assessment in a wider range of domains is the 'potential to assess progress and process as essentials to learning' (p.83). The standardisation of portfolio assessment is a central issue in the literature. To ensure validity and inter-rater reliability, portfolio assessment should be structured. Herman et al (1992) argue that portfolio assessment should be based on the identification of:

- A clearly-stated assessment purpose
- Guidelines for the selection of entries for the portfolio
- Criteria for the assessment of this portfolio content.

54. Focusing on the second of these points, Simon and Forgette-Goroux developed a content selection framework for the portfolio assessment of problem-solving competency. For the purpose of this framework, the portfolio is defined as:

...a cumulative and ongoing collection of entries that are selected following a given framework, and reflected upon by the student, to assess his or her development of a specific but complex competency. It is therefore primarily an assessment tool.

55. The authors' framework is designed to encourage students, with their teachers, to collect information from across the curriculum about their holistic development of this competency. The framework therefore contains cognitive, affective, metacognitive and developmental dimensions. Although these dimensions are fixed, the selection process is flexible. Thus the number of entries and their format in the portfolio can therefore accommodate various levels of competency and subject integration. However, the authors recommend selecting entries from a variety of contexts. It follows that this would encourage students' broader development and demonstration of this competency with the support of their teachers. The framework is summarised in Figure 3.

*Figure 3: A content selection framework for a portfolio assessing problem-solving competency, reproduced from Simon and Forgette-Goroux (2000)*

| <b>Dimension</b> | <b>Definition</b>  | <b>Example of entries</b>  |
|------------------|--|--|
| Cognitive        | Knowledge needed to apply the competency eg problem solving strategies                               | Personal written summary of a minimum of five different problem solving strategies |
| Affective        | Propensity to apply the competency eg self confidence in ability to solve problems                   | Rating scale on confidence in performing school work                               |
| Behavioural      | Actual performance or manifestation of the competency as it is applied eg actually solving a problem | Evidence of three to five problems solved in various contexts                      |

|               |  |  |
|---------------|--|--|
| Metacognitive | Self-reflection and self-regulation eg awareness of own problem solving process and its effectiveness                | Comparison of problem solving processes used in at least two situations and self reflected on, before and after rating scales            |
| Developmental | Description of attainment level of competency according to stated outcomes eg descriptive scale filled out regularly | Identification of a level of attainment using a four point descriptive scale after first problem solving attempt and another after three |

56. The authors offer further potential examples of entries focusing on the affective, metacognitive and developmental, which helps to address the most challenging aspects of assessing competence:

1. Affective- a biography in mathematics (op. cit. Stenmark, 1992), inventories of a student's personal reactions to a specific problem, excerpts from a log book, or attitudinal scales and various types of self-reports.
2. Metacognitive- short written or tape-recorded verbal *justifications* accompanying each entry, *comparisons* of entries collected at various stages of development, or a personal overview of all the various entries and how their *integration* reflects their competency.
3. Developmental- a four- to six-level descriptive scale (from limited to full development) could be used holistically at regular intervals, filled out by the student and/or teacher, and included in the portfolio.

57. The authors also note that if the cognitive or behavioural dimensions rely on test results, the portfolio is reduced to a showcase for conventional assessment results, rather than a basis for self-reflection. Indeed, it seems that portfolio assessments have strong potential for providing a focus for student self-assessment and a basis for improving the accuracy of self-assessment judgements, developing this aspect of learning to learn competence.

58. Black (2010, p. 8) argues that: 'a portfolio can serve as each pupil's own record of their achievements, and can also be a documentary basis for comparison, between teachers in the same school, and between different schools, to ensure comparability in their standards'. As such, portfolios are 'the optimum way' of allowing evidence of competence to be communicated within a rigorous assessment framework. Black takes a more prescriptive stance than Simon and Forgette-Goroux, arguing that the framework should specify not only the aims and assessment criteria in advance but also the number and timing of tasks, which could prove challenging and would reduce the flexibility of the approach. However, Black also argues that a portfolio framework should be trialled to ensure it allows all pupils to produce evidence of their competence. He makes the important point that there will be diversity in the amount and quality of guidance teachers provide their students. This can be recorded and taken into account in overall assessment judgements. However, Black notes Poehner and Lantolf's (2005) point that this may not be a substantive issue. They instead propose a concept of dynamic assessment: the work learners produce once they have received help is a better indication of their real potential.

59. A policy example of the use of portfolio assessment for high stakes summative assessment was available from Australia via Looney (2009) and is reproduced here.

There is no whole-cohort external testing or examining in secondary schools in Queensland. In 1972, Queensland abolished external examinations and replaced them with a system of moderated internal assessments. School-based assessments for the Senior Certificate (year 12) are currently moderated for those subjects that count towards university entrance. Moderation aims to ensure consistency, comparability and equity of teacher judgments of student performance standards. The moderation processes for the Senior Certificate involve subject-based panels of expert teachers providing advice to schools on the quality of their assessment program and their judgments of quality of student performance based on sample portfolios. The system involves follow-up where panels identify difficulties. There is negotiation of the final results to be recorded on the Senior Certificate. Results are expressed in terms of five relative grades or 'levels of achievement' expressed in terms of standards descriptors (referred to as 'exit standards').

*Reproduced from Sebba and Maxwell (2005) in Looney (2009).*

60. Frameworks for portfolio content selection and judgement criteria are clearly an important means of assuring the reliability and overall validity of this flexible form of assessment. However, it should be recalled that the earlier section on the specification of learning outcomes found that it is crucial to develop a shared understanding of assessment requirements. Caldwell et al (2003 op. cit. Looney, 2011) found that training can improve inter-rater reliability in such performance-based assessments. Similarly, Black (2010) reports that assessment by teachers using methods such as portfolios can meet quality and comparability requirements and this method of assessment can serve either summative or formative purposes. However, the right type of support is essential. Black (Ibid.) identifies moderation meetings with 'blind marking' to compare, discuss and resolve judgements based on a sample of pupils are 'the key to securing intra- and inter-school comparability'. This can create a positive feedback loop, enhancing teachers' assessment judgements. This can then lead to the development of teacher learning communities for the exchange of experiences and support for one another (William, 2007). Assessed examples of students' work shared through these networks or communities, or through guidance for teachers, can also contribute to the comparability of teachers' assessment judgements. Sadler (1989) argues that 'exemplars' should be selected to be typical of each level of attainment defined in the assessment. A range of exemplars should be to encourage creativity and they should be updated to keep them relevant and interesting. These exemplars can provide insights not just into outcomes but also the process of learning, informing teachers' classroom practices.
61. Although Popham (2001) was concerned with 'item-teaching', now commonly known as 'teaching to the test', others argue that what is really needed is a test worth teaching to (Black et al., 2011; William, 2009). This section interpreted the literature as suggesting that standardised tests can contribute to the assessment of key competences if they include items with:
10. Structure and content that reproduce real-life contexts authentically
  11. Multiple steps requiring a chain of reasoning and a range of competences
  12. A range of formats allowing responses that tap into different competences.
62. However, unless or until e-assessment can provide the basis for a quantum leap in our conception of tests and assessment instruments more generally, then multiple sources of

information about learners' competences are likely to be needed. In particular, whilst tests may implicitly assess attitudes, other instruments such as questionnaires, observation, dialogue and performance-based assessments such as presentations, projects or portfolios may explicitly assess attitudes.

*Using assessment to develop learners' key competences*

63. Whereas the previous section focussed on using summative assessment to report learners' competences, this section focuses on using formative assessment to develop those competences. The purpose of formative assessment has been defined as 'to help learning and foster deeper engagement with it: essentially a pedagogical approach rather than a separate activity added to teaching' (Harlen, 2007, p. 16). The following section details the overall pedagogy of formative assessment for the development of competences. The subsequent section focuses on aspects of formative assessment relating to peer and self-assessment for the development of key competences.

Assessment for developing key competences

64. Crooks' (1988) literature review identified a distinction between 'deep learning' and 'shallow learning'. The deep learning approach recalls aspects of the key competences for lifelong learning.

| <b>Deep Learning Approach</b>  | <b>Surface Learning Approach</b>             |
|--|--|
| An intention to develop personal understanding                           | An intention to be able to reproduce content |
| Active interaction, particularly in relating new and previous experience | Passive acceptance of ideas and information  |
| Linking ideas together using integrating principles                      | Lack of recognition of guiding principles    |
| Relating evidence to conclusions   | Focusing learning on assessment requirements |

65. Harlen and James (1997) subsequently argued that the deep learning approach requires teachers to recognise learners' present understandings and to respond appropriately to develop those understandings. They also argued that teachers should enable students themselves to recognise and respond in this way too. It follows that a more flexible approach to teaching and learning, strongly informed by formative assessment, is necessary for the development of key competences. At an individual level, this acknowledges that rates of progress and interests will vary. At a group level, this recognises that interaction in varied contexts can lead to unexpected paths that are nonetheless valuable for the development of risk-taking, creativity and problem-solving competences. Finally, it is important to note that some aspects identified in shallow learning could be made to serve the deep learning approach. Thus the reproduction of content could be useful in certain contexts but assessment requirements could be made to focus on the deep learning associated with key competences.
66. Early work on formative assessment focussed on teachers giving feedback to students (Ramaprasad, 1983). However, Sadler (1987) provided three simple steps towards formative assessment, emphasising the learners' understanding of the intended learning outcomes, their present position in relation to those outcomes and, most importantly, how they could close the gap between the two. This was influential in the work of Black and Wiliam (1998b) who

emphasised that everyone involved in assessment needed this understanding. In addition, the work of Dweck (1999), who compared learners' goals and outcomes, provides some insight for the elaboration of the three steps:

- Learning intentions...                      ...learning goals not performance goals
  - The present position...                      ...in relation to assessment criteria rather than peers
  - How to close the gap...                      ...with an emphasis on effort rather than 'ability'
- (Sadler, 1987)                                      (Dweck, 1999)

67. Thus teachers and learners need to develop a shared understanding of learning outcomes relating to key competences and what could count as evidence of the development of a competence in a specific (inter)disciplinary context. The focus should be on the learning outcomes themselves rather than de-motivating and unhelpful social comparisons of present competence, and on the malleable nature of competence rather than the fixed nature of 'ability'. This thinking can be extended to the development of a shared understanding of key competences with parents too. Naturally, constructive parental involvement can support learners' motivation and attainment (Fullan, 2001).

*Figure 4: Assessment for Learning: a strong evidence base for formative assessment*

According to the Assessment Reform Group in the UK (2002), Assessment for Learning (AfL) refers to the extensive, systematic use of formative assessment. AfL promotes a wide range of practices and systemic measures which are designed to support the process of seeking and interpreting evidence for use by learners and their teachers to decide where a) the learners are in their learning, b) where they need to go and c) how best to get there. Although a range of assessment methods can contribute to AfL, including even summative tests, teacher assessment is the most important method, providing detailed insights over time.

According to the Assessment Reform Group, the 10 principles for AfL should be:

1. be part of effective planning of teaching and learning
2. focus on how students learn
3. be recognised as central to classroom practice
4. be regarded as a key professional skill for teachers
5. be sensitive and constructive because any assessment has an emotional impact
6. take account of the importance of learner motivation
7. promote commitment to learning goals and a shared understanding of the criteria by which they are assessed
8. enable learners to receive constructive guidance about how to improve
9. develop learners' capacity for self-assessment so that they can become reflective and self-managing
10. recognise the full range of achievements of all learners.

There is a substantial evidence base for the positive impact of such formative assessment on the learning outcomes that students' achieve, and their motivation for learning (Black & William, 1998a). The research evidence suggests that formative assessment produces greater increases in students' learning than reductions in class sizes or increases in teachers' content knowledge, and it is also more cost effective to implement (William & Thomson, 2007). As a result, of its simple but powerful message (Black & William, 2003) this research evidence has influenced the



68. Building upon the earlier research, Wiliam and Thomson (2007) advance a concise line-by-line definition, apparently for the consumption of a wider audience. Formative assessment is then:

- Students and teachers
- Using evidence of learning
- To adapt teaching and learning
- To immediate learning needs
- Minute-to-minute and day-by-day.

The authors proceed to identify the need for three processes supported by five strategies. These strategies are divided between the roles identified for each learner, their peers and their teacher. This is colour-coordinated in Figure 5 which provides an overview of the roles, processes and strategies. Importantly, the responsibility for formative assessment is therefore shared between the teacher, the learner and their peers. The importance of peer and self-assessment is the focus for the next section of this literature review. The particular roles of learners and their peers will be the focus of the next section.

*Figure 5: Five strategies for formative assessment (adapted from Wiliam and Thomson, 2007)*

| <b>Processes:<br/>Roles:</b> | <b>Where the learner is going</b>                                      | <b>Where the learner is right now</b>  | <b>How to get there</b>                        |
|------------------------------|--|--|--|
| <b>Teacher</b>               | Clarifying and sharing learning intentions                             | Engineering effective classroom discussions, questions, activities, and tasks that elicit evidence of learning | Providing feedback that moves learners forward |
| <b>Peer</b>                  | Understanding and sharing learning intentions and criteria for success | Activating students as instructional resources for one another   |  |
| <b>Learner</b>               | Understanding learning intentions and criteria for success             | Activating students as the owners of their own learning  |  |

69. Beyond the Anglophone literature, the OECD commissioned two reviews of formative assessment, one from the literature in French and one from the literature in German (Wiliam, 2010). Allal and Lopez (2005) found that, whereas the Anglophone literature emphasises feedback for correcting mistakes, the Francophone literature emphasis feedback for regulating learning. This greater emphasis on the learning process arguably brings formative assessment conceptually closer to the development of learning to learn competence. Indeed, the recent literature in French had focused on peer and self-assessment, including teacher and learner co-construction of assessments. However, the authors conceded that, though theoretically

insightful, the literature required more empirical research. Köller (2005) focused on the empirical literature in German but also found a lack of research evaluating the outcomes of formative assessment interventions. However, one area of work had focussed on reference norms, finding that when teachers compared learners' current performance with their previous performance (individual reference norm) they learnt more than when they compared their current performance with other learners' performance (social reference norm). This is consistent with the Anglophone research literature and suggests that the findings are more widely applicable.

#### Peer and self-assessment for developing competences

70. Self-assessment is an inevitable aspect of successful formative assessment. To internalise teachers' feedback, learners need to reflect on their learning. However, an explicit focus on peer and self-assessment is a feature of successful formative assessment for children as young as five years old. Although peer and self-assessment for the formative purpose is generally honest and trustworthy, it is a competence that needs to be developed over time. The result is, however, more committed, effective and independent learners (Black & Wiliam, 1998b). In a review of peer and self-assessment, Mills and Glover (2006) use Boud's (1991) definition of self-assessment as:

...the involvement of students in identifying standards and/or criteria to apply to their work, and making judgements about the extent to which they have met these criteria and standards.

71. It therefore has the potential to help students develop their understanding of intended learning outcomes relating to key competences. This understanding of the learning intentions was an essential feature of the wider formative assessment process outlined in the previous section. Since key competences may be an unfamiliar approach to learning for many current students, developing their understanding of the new learning intentions would seem particularly important. This clarification of general goals and specific tasks is essential for self-regulated learning (Boekaerts, 1999; Winne, 2001). Indeed, Mills and Glover (2006) draw on several sources when they report that for self-assessment:

The promotion of work skills, autonomy, self-directed and lifelong learning was deemed to be an essential part of this process (Boud and Falchikov 1989, Falchikov and Boud 1989, Boud 1994, Boud 1995, Butter and Winne 1995, Black and Wiliam 1998, Boud 2000, Black and Harrison 2001, Race 2001, Sluijsmans et al. 2001).

72. In relation to specific key competences, James et al (2007) identified formative assessment as one possible strategy for promoting learning (how to learn) learn practices. Given their learner-centredness, peer and self-assessment are identified as particularly relevant elements of formative assessment. The underlying competences for these learning practices need to be developed. Since the practices involve learners working both alone and with others, they imply both learning to learn and social competences. Several studies emphasise the need to train or prepare learners for peer and self-assessment, particularly so that they understand the learning outcomes and assessment criteria (Mills and Glover, 2006). There can be synergy between the training for the two forms of assessment: 'Peer discussion of specific examples of work should help pupils to understand the criteria by which to assess the quality of their own work' (Black, 2010, p. 5). Finally, summative tests can contribute to formative assessment in general and to peer and self-assessment in particular. For example, learners can work in pairs or groups to review each other's work and develop an understanding of the assessment criteria, thereby becoming better peer and self-assessors, and more independent learners

(Black, Ibid.). Figure 6 outlines several tactics for peer and self-assessment that could help learners to develop their key competences.

Figure 6: Peer and self-assessment tactics for the development of key competences for lifelong learning

|  |
|--|
| <p>There is a range of possible peer and self-assessment tactics which teachers can use and train their students in using. This moves the discussion from principles and strategies to techniques for formative assessment. These appear to have potential for the development for the key competences in general, specific aspects of learning to learn and social competences, and to contribute to lifelong learning more generally:</p> <ul style="list-style-type: none"><li>• Teachers encourage initial reflection with good/average/weak examples</li><li>• Students modify/generate/discuss assessment questions and criteria</li><li>• Teachers provide time for students to reflect on their own work</li><li>• Teachers facilitate feedback between learners eg in pairs</li><li>• Students give feedback and discuss peer and self-assessments</li><li>• Teachers highlight differences between learner and teacher marks/comments</li><li>• Students and teachers discuss textbook contents: what's easy ... what's hard... why?</li><li>• Students helping each other: find a problem and fix it; what would you advise?</li><li>• Teachers challenge apparently 'correct' answers: do you <i>really</i> understand?</li><li>• Discussing learning intentions and outcomes afterwards: what <i>was</i> it all about?</li></ul> <p>Source: King's College London presentation on formative peer and self-assessment for the development of key competences (Hodgen, Kuchemann, &amp; Pepper, 2011)</p> |
|--|

73. One valuable way of providing a structure to encourage learners to identify and act upon assessment information about themselves is to encourage them to reflect on examples of their work. The section on reporting learners key competences showed how a framework could be developed to help learners, with their teachers, to select examples of work to be included in a portfolio, to reflect on next steps in learning and ultimately to review and summarise a period of learning (Simon and Forgette-Goroux, 2000). Portfolios therefore have potential for the development of the self-regulatory aspect of learning to learn competence. The examples selected as entries for portfolios could be illustrative of learning activities in contexts that are difficult to reproduce in standardised tests, such as interpersonal interactions and dynamic situations. Portfolios can therefore provide a store of information about learners' demonstration of their competences, which they can keep under review with their teachers. Some development of the key competence relating to initiative and entrepreneurship could therefore be involved in the creation, selection and review of entries for portfolios. Furthermore, since the production of portfolios could involve learners, their peers and their teachers working together it also has potential for the development of social competences (Pepper, 2011).
74. Whilst providing a record of learners' progress in developing key competences, portfolios can also serve a secondary purpose. The section on using assessment to report learners' key competences noted that portfolios could provide a focus for teachers in networks called 'teacher learning communities' to review and develop their assessment practices. Just as portfolios can serve formative or summative purposes, these communities can help teachers to develop their assessment practices in relation to both of these purposes. Furthermore,

these practices may include the use of portfolios but are likely to extend to a wide range of sources of information. At a fundamental level, this could mean observing learners' performances and using dialogue to elicit information about their understandings and misconceptions. In essence, these communities can provide a form of sustained professional development for teachers, by teachers.

75. Rather than pure top-down or bottom-up approaches to policy implementation, teacher or 'professional learning communities' are arguably consistent with a synthesis of the two approaches, emphasising horizontal links between education professionals who can provide each other with an appropriate balance of pressure and support (Fullan, 2001; Hill & Hupe, 2002). Fullan (Ibid., p.92) found that:

Pressure without support leads to resistance and alienation; support without pressure leads to drift or waste of resources. Professional learning communities or collaborative cultures incorporate both support and pressure through lateral accountability as teachers together monitor what they are doing.

76. This pressure and support can provide the scrutiny and feedback that is necessary for the implementation of changes in assessment practices. Furthermore, where there is constructive discussion of assessment practices for broader learning outcomes such as key competences, there are positive impacts on learners' effort and attainment (Harlen & Deakin Crick, 2003). This constructive discussion can take the form of peer review by teachers. Examples from New Zealand and Scotland indicate that this may be a useful approach to assessment that contributes to national monitoring and evaluation using assessment methods for which teachers themselves are responsible. Stobart (2008) recounts how teachers receive support in developing the necessary assessment competences, meaning not only knowledge and skills but also supporting attitudes:

The highly respected New Zealand NEMP [National Education Monitoring Programme] survey adds another constructive dimension: it uses practising teachers to visit schools as the assessors of the open-ended and group activities. The strength of this approach, also used in Scotland, is that it also contributes to professional development, as teachers learn how the pupils approach problems and also develop a sense of the standards to be achieved. It also leads to teachers seeing themselves as part of national monitoring rather than the recipients of it – an example of professional trust (p.140)

77. Wiliam (2007) identified teacher learning communities as offering the most hope for changing routinised teaching practices and incorporating formative assessment. However, research with teachers had indicated that these communities would need to operate according to five broad principles. Like Fullan, Wiliam identifies the need for pressure (or 'accountability') and support. Wiliam also identifies the need for a gradual approach, with each teacher implementing no more than two or three assessment techniques any one time to avoid a loss of routine and disorder. Furthermore, the approach should be flexible, since techniques that work in one context may not work in others or need adjustment (see also Resnick, Spillane, Goldman, & Rangel, 2010). Similarly, teachers should be able to choose the techniques they use; some teachers will be more suited to some techniques (eg orchestrating whole class discussions) than to others (eg facilitating work in small groups). According to this line of thinking, a shared understanding of key competences is therefore only the first step and should be followed by a process of developing techniques for assessing key competences, specifically through teacher learning communities. Wiliam and Thomson (2007) identify these communities as allowing teachers to exercise their professional judgement, to sustain it over

time, to challenge it in a non-threatening environment, to gain real examples that motivate their actions and to interpret research in their specific circumstances.

78. Another source also emphasises the need for teachers to develop their assessment practices themselves. Gardner, Harlen, Hayward and Stobart (2011) summarise the findings of two contrasting research projects which sought to develop teachers' formative assessment practices in England. In one project, the researchers created a network of teachers in two localities and worked with them to develop effective formative assessment practices. The project is particularly relevant to here because it incorporated peer and self-assessment using portfolios (Black, Harrison, Hodgen, Marshall, & Serret, 2007). Through the network, teachers participated in the creation of new formative assessment practices, evidence and materials for wider use. This approach enhanced teachers' understanding of the principles underlying the assessment practices and increased their commitment to sustained changes in their practices. This constructivist approach contrasts with the second research project, where teachers were trained in practices that had already been developed. This transmission approach did lead to changes in teachers' practices that were consistent with the aims of the training. However, there was evidence that teachers had gained a procedural understanding of the assessment practices but lacked a conceptual understanding of the underlying principles. This resulted in some confusion about the methods and benefits of formative assessment, reducing the likelihood of effective and sustained change in teachers' practices. However, teachers' commitment to sustained change is crucial because, as noted in Bowe, Ball and Gold's (1992) work, teachers are professionals who ultimately have discretion in which aspects of policy (and research) are actually implemented in practice.
  
79. Although these findings suggest that the constructivist approach has more potential than the transmission approach, the literature cautions that it is very resource-intensive, particularly in terms of teachers' and researchers' time. In particular, teachers need time for discussion, reflection and planning. However, the constructivist approach also has the benefit of being more consistent with the type of learner-centred activities associated with key competences (Gordon, et al., 2009). Teachers in many countries report focussing more on knowledge transmission to learners in passive roles than supporting learners in actively constructing their development of knowledge or broader competences. Such constructivist beliefs do received strong support from teachers in many countries but there is a great deal of variation. The fact that much of the variation in teachers' beliefs about learning and their teaching techniques is between teachers rather than schools and countries suggests that training and development needs to be targeted to individual teachers. It also needs to be supported with recognition for teacher effectiveness and innovation (OECD, 2009).
  
80. It seems likely that experiencing a learner-centred approach for themselves is likely to promote teachers' use of this approach in their own practices. Whether constructivist or transmissionist, a fundamental challenge is scaling up the practices from localities with high researcher involvement to systems as a whole with limited or no researcher involvement. However, if teachers who experience a constructivist approach have a better understanding of the underlying principles and benefits of assessing key competences, it positions them to become advocates for effective change.

## II. GLOSSARY OF TERMS

This glossary refers to existing formulations of terminology in the academic and policy literature on education. However, the definitions given here have been developed specifically for use with this literature review and the associated policy guidance.

### 1. Assessment

Inferences about an individuals' knowledge, skills, attitudes or other capabilities with reference to pre-defined criteria and using one or more assessment methods such as tests, observations, interviews, projects or portfolios.

[Gipps \(1994\)](#); [Mislevy \(1994\)](#); [Cedefop \(2008\)](#)

### 2. Competence

A combination of knowledge, skills and attitudes applied appropriately to a context in order to achieve a desired outcome.

[OJEU \(2006\)](#)

### 3. Curriculum

The entire learning experience planned on the basis of aims, values, intentions, resources, relationships and activities in formal or informal settings. [Cedefop \(2010\)](#) [QCDA \(2008\)](#); [Kelly \(2009\)](#)

### 4. E-assessment

Assessment using information and communication technology to present information and record responses.

[Busuttil-Reynaud and Winkley \(2006\)](#)

### 5. Evaluation

(The process of making) a systematic judgement about the value of objects, processes or outcomes with reference to explicit criteria and one or more sources of information. Education evaluation often refers to education systems, institutions or programmes. One source of information may be assessment, typically with results aggregated across a population.

[Harlen \(2007\)](#); [Newton \(2007\)](#)

### 6. Formative assessment

Or 'assessment for learning' refers to the use of assessments to inform teaching and learning during a period of instruction.

[Black and Wiliam \(2003\)](#)

### 7. Key competences

The competences identified as necessary for personal fulfilment, active citizenship, social cohesion and employability through lifelong learning in a knowledge society.

[OJEU \(2006\)](#)

### 8. Learning outcomes

Statements of what a learner should know or be able to do or be as result of a process of learning (as a opposed to statements of learning inputs such as duration, location and method).

[Leney, Gordon et al. \(2008\)](#); [Cedefop \(2011b\)](#)

9. Peer assessment

Assessment of a learner's work by a fellow learner with reference to the intended learning outcomes.

[Boud \(1995\)](#); [Busuttil-Reynaud and Winkley \(2006\)](#)

10. Performance-based assessment

'Authentic' assessment using 'real-world' tasks such as collaborative problem-solving exhibitions, experiments, group work, interviews, plays, presentations, projects and role plays. The assessment may involve the use of listening and observation or portfolios and diaries. However, the term is sometimes used with reference to open-ended tasks in tests and contrasted with multiple-choice tests.

[Firestone, Mayrowetz et al. \(1998\)](#); [Darling-Hammond and Snyder \(2000\)](#); [Looney \(2011\)](#)

11. Portfolio

A series of entries compiled over a period of time, intended to be representative of a learner's progress in relation to a set of learning outcomes or to showcase work identified as their best.

[Simon and Forgette-Giroux \(2000\)](#); [Busuttil-Reynaud and Winkley \(2006\)](#)

12. Reliability

The extent to which an assessment, if repeated under similar conditions, would achieve the same result.

[Harlen \(2007\)](#)

13. Self-assessment

With varying support from others, an individual (or group) identifying learning outcomes and making judgements about the extent to which their learning achieves these outcomes.

[Boud \(1995\)](#)

14. Standardised tests

Tests that are developed, administered, scored and graded according to uniform procedures designed to ensure consistent outcomes that can be meaningfully compared across a population.

[Morris \(2011\)](#)

15. Summative assessment

Or 'assessment of learning' refers to the use of assessments to summarise an individual's learning at the end of a period of instruction.

[Black and Wiliam \(2003\)](#)

16. Validity

Comprehensively, the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on information resulting from assessments.

[Messick \(1989\)](#)

More narrowly, the extent to which the intended construct is assessed (or under-represented, or the extent to which an unintended construct is assessed instead).

[Gipps \(1994\)](#); [Wiliam and Black \(1996\)](#)

### III. FULL EXAMPLES ON DEVELOPING ASSESSMENT POLICY

#### a. Competence standards in compulsory education in Austria

Three examples from Austria are detailed here. The first relates to competence standards for primary and lower secondary education. The second relates to the assessment of subject-based and cross-curricular competences in upper secondary education. The third relates to a project in Vienna that is using portfolio assessment for key competences in secondary vocational education.

##### *Competence standards for primary and lower secondary education*

In Austria, standards for German, mathematics and English build on the curriculum and provide a basis for external standardised tests at the end of primary (age 10) and lower secondary education (age 14). These standards describe 'what students should regularly achieve'.

The standards were developed after discussions began in the late 1990s. They were first piloted in 18 schools in 2004 and then with 100 schools in 2006. Standardised test items were trialled and teachers' needs for guidance were identified. The piloting therefore led to refinements in the standards and the tests. Legislation allowing a large sample of students to be assessed was passed in 2009. The purpose was to evaluate the education system as a whole. However, there are now plans for all students to be assessed so that each can receive formative feedback. As a result, students will be assessed in mathematics in 2012, English in 2013 and German in 2014.

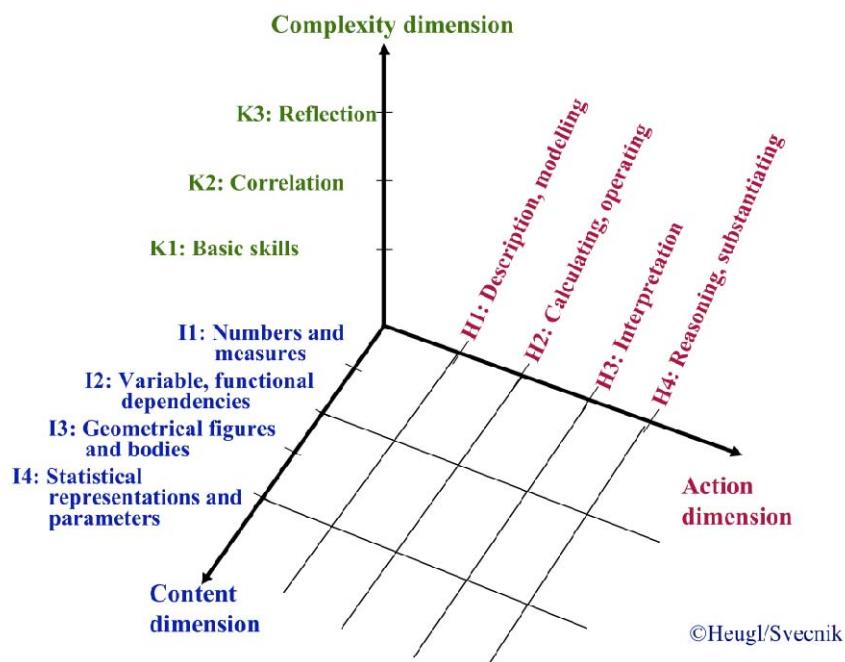
Before the government took the decision to introduce the standards, there was extensive consultation on the policy. Policy consultation started with defining the goal of the standards – should they be approximate orientation standards or precise minimum standards (for each individual or for each class or school). Another topic of consultation was the release of data – who should receive which part of the results? From the very beginning it was clear to all major actors that, in order to avoid over-simplistic comparisons, school league tables should not be made possible.

Once the decision was taken to introduce the standards, accompanying research by the Centre for School Development identified teachers' specific needs for information and support in using the standards. The findings were fed back into political discussions and informed the development of supporting structures, such as in-service training. A special budget was allocated to teacher training universities to prepare teachers for using the standards.

Extensive preparations for the standards also included a test of a large sample of students by the recently founded Federal Institute for Education Research, Innovation & Development of the Austrian Schooling System (BIFIE). These results, prior to the introduction of the standards, will provide a baseline to against which to compare results following the introduction of the standards.



The standards for English are based on the Common European Framework of Reference for Languages. The standards for German and mathematics are underpinned by a multi-dimensional model of competence. The model for mathematical competence is illustrated below. It has three dimensions: content, action and complexity. This model provides the basis for the national standardised tests in mathematics. The items in these tests are each developed with referenced to these dimensions.



Students take the tests in the final year group of primary education and of lower secondary education. A pilot system of formative assessment called IKM, translated as informal competence diagnostics, is being used in the penultimate year group of lower secondary education. Schools and teachers have online access to a large bank of formative test items that are similar to the summative test items. Teachers can administer these items to their pupils and receive feedback on their students' progress which they can use to inform next steps in teaching and learning before the summative tests. This is supported with examples of proto-typical tasks, in-service training on the competences, continuously updated web-based examples and free online handbooks for practitioners, which were also sent to schools as paper copies. These sources of guidance encourage peer assessment, team work and the explanation of answers. Furthermore, trained feedback moderators can be called in by schools to help explain the results of the national competence assessments and to work on responses at school level.

Initial signals about the impact of these assessments suggest that teachers have begun to broaden their practices beyond simply transferring knowledge to developing wider understanding. They also appear to be more familiar with using assessment information as an evidential basis for their teaching practices, with a view to enhancing learning outcomes for their students.

## *Assessing key competences in upper secondary education<sup>8</sup>*

In Austria, the range of assessment methods for the *Reifeprüfung* (examinations at the end of upper secondary general and vocational education for entry into higher education, commonly also known as *Matura*) have been broadened and strengthened in order to address cross-curricular competences. The assessment methods include:

- A thesis on a research project of their choice
- A written examination at the end of the final year
- Then an oral examination on their project.

Changes to these assessment methods are currently being piloted in schools.

The thesis was voluntary and subject-based but it will be obligatory and multidisciplinary in general education from 2014 and vocational education from 2015. Students will be able to choose a teacher to be the tutor for the project on which their paper will be based.

The written examination was focused on knowledge in German, mathematics and a foreign language. However, it will now have a stronger focus on subject competences and sustained understanding. The examination was internally developed by schools but it will now be standardised across schools. It will therefore be externally developed by the national agency called BIFIE.

The oral examination will have a more cross-curricular perspective. Students will be required to present and defend their multi-disciplinary project in this oral examination, which will be observed by a representative of the examinations commission.

## *Portfolio assessment of cross-curricular key competences in Austria<sup>9</sup>*

A project in the Austrian province of Vienna is using portfolios to assess the cross-curricular key competences of students in lower secondary general education schools in the cohort aged 14/15. Whilst the intention is to assess all eight key competences, the emphasis is on digital competence, learning to learn, social and civic competences, sense of initiative and entrepreneurship, and cultural awareness and expression. Each key competence is divided into indicators and descriptors, which provide the basis for selecting evidence of students' competences to be included in a portfolio of their work. Teachers assess students' competences in relation to each of the descriptors at four levels: not observed; partial; expectation met; or, excellent.

The portfolios have a formative purpose (during the period of learning) and a summative purpose (at the end of a period of learning). During the period of learning, students receive feedback on their progress in demonstrating each key competence. At the end of a period of learning, students receive an attachment to the lower secondary leaving certificate detailing

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<sup>8</sup> This examples is presented in the context of high stakes summative assessment in Section 4.b. of the Policy Handbook.

<sup>9</sup> This example is presented in Section 4.c. of the Policy Handbook amongst other examples of portfolio assessment.

their key competences, which complements their subject specific marks. Since the leaving certificate otherwise contains almost entirely subject-based marks, this attachment puts cross-curricular key competences in focus. This makes the key competences, highly relevant to the world of work, visible to potential employers.

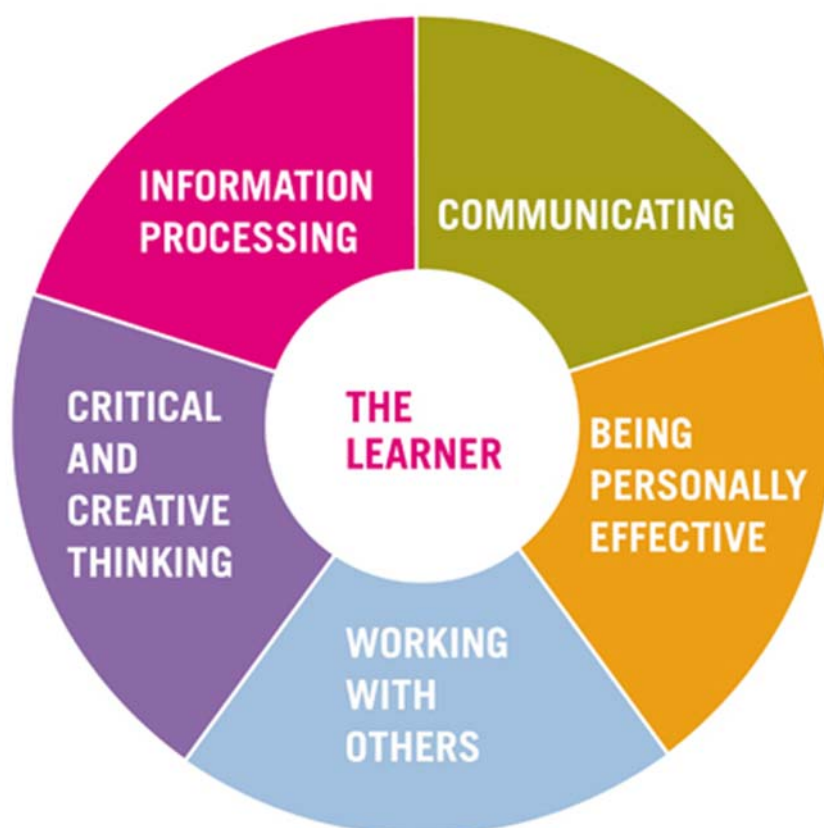
## **b. Key skills in Ireland**

### *Review and consultation*

In Ireland, a review of senior cycle (upper secondary) education for 15 to 18 year olds provided an opportunity to embed key skills in subjects across the curriculum. The process began in 2002 with the publication of a discussion paper by the National Council for Curriculum and Assessment (NCCA). NCCA led a public consultation on the senior cycle and commissioned an international comparative study on the transition from primary to secondary education in 2003. NCCA then developed a set of proposals for changes to senior cycle curriculum and assessment, including the incorporation of five key skills identified as relevant to the lives of learners.

### *The five key skills*

The five key skills are shown in the below figure with *the learner* at the centre, implying learning to learn across the key skills. The formulation of these key skills was informed by the European Reference Framework of key competences, the OECD's Defining and Selecting Competences projects, a review of 35 national curriculum frameworks (Mosely et al, 2005) and, more specifically, the 9 cross-curricular key competences in Québec. A *Key Skills Framework* (NCCA, 2009) was developed setting out elements and learning outcomes for each skill.



The aim is to ensure that, rather than being a minor addition to an otherwise traditional curriculum, key skills make a major difference to students' experiences and learning across the curriculum. The five key skills are seen as relevant to all subjects and the intention is for the key skills to be embedded in subjects.

*Embedding learning outcomes*

The re-writing or 'review' of subject syllabuses is an integral part of the general review of senior cycle, and it is the revision of subject learning outcomes that allows for the process of embedding the key skills learning outcomes.

Each key skill is specified as *elements*, which contain specific *learning outcomes*. These key skills learning outcomes are embedded in subject learning outcomes during the writing of the syllabus for each subject. An information-processing learning outcome embedded in a biology learning outcome is shown below.

|   |   |
|---|---|
| <b>An key skill learning outcome in information-processing</b>  | <b>A subject learning outcome in biology</b>  |
| Use secondary data sources; locate and comprehend relevant information from books, scientific publications, internet, databases and other sources | Use a database to find organisms whose genomes contain an identified amino acid sequence, and investigate the evolutionary relationship of two species using alignments of amino acid sequences |

Each syllabus is audited to ensure that opportunities are taken to develop the key skills in subjects. The developers of each subject syllabus use an 'audit tool' for this purpose. An extract from the tool is shown below. The completed version is submitted to a monitoring team with a brief report on the inclusion of key skills in the subject syllabus.

| <b>Key skill</b>               | <b>Elements</b>  | <b>Learning outcomes</b>   | <b><i>Subject syllabus learning outcomes reflecting the key skills learning outcome</i></b> |
|--------------------------------|--|--|---|
| Critical and creative thinking | Thinking imaginatively, actively seeking out new points of view, problems and/or solutions, being innovative and taking risks. | <p><i>Students should be able to:</i></p> <ul style="list-style-type: none"> <li>• recognise that different mind-sets are associated with different forms of thinking</li> <li>• be motivated to seek out alternative perspectives and viewpoints and to reframe a situation</li> <li>• be willing to take risks and to learn from mistakes and failures</li> <li>• be persistent in following through ideas in terms of products and/or actions</li> <li>• develop a strong internal standard in relation to the merits of their own work.</li> </ul> |   |

### *Assessment processes*

Recommendations for the assessment of the subjects reflect the key skills and key skills are assessed as part of the subject's assessment components. The NCCA's representation structures include representatives of the government's Department for Education and Skills and the State Examination Commission to ensure that the key skills are reflected in the assessment methods for each subject. For instance, the new subject called *Politics and Society* involves discussion and debate, a variety of contemporary media, data collection and analysis, portfolios of students' work and reflective diaries. The final assessment is based on a report on a citizenship project (20%) and a written examination (80%). The report on the project is assessed against criteria at three levels, which include references to learners' rationales for their projects and their reflection on key skills developed during and as a result of the project.

### *Implementing the key skills*

In advance of implementation of the revised subject syllabuses, a considerable amount of work has been done through a network of 18 schools. Schools in this network were interested to explore and illustrate the practical implications of embedding key skills within the subject learning outcomes and in teaching and learning. Nine of the schools piloted the approach using an action research methodology, and this in turn has informed the development of national policy. The aim was to create within the network a climate of opportunity for reflection, critique and reframing of practice in key skills teaching and learning. Initially, teachers explored the benefits and challenges of key skills in classroom planning and teaching for their own subject areas. They also worked together in small 'buddy groups' to support each other's reflections on their changing practices. Some of the schools then extended the work to a whole school approach. The project teachers in these schools provided professional development to other staff members and supported them by sharing resources and approaches that worked well for them. This process has generated a considerable body of illustrative material which has been published on the NCCA website, including video materials, school stories, reports and toolkits for schools to get started with key skills: [http://www.ncca.ie/en/Curriculum\\_and\\_Assessment/Post-Primary\\_Education/Senior\\_Cycle/Key\\_Skills/](http://www.ncca.ie/en/Curriculum_and_Assessment/Post-Primary_Education/Senior_Cycle/Key_Skills/) and <http://action.ncca.ie/key-skills-introduction.aspx>.

### *Future developments*

Having introduced key skills in the senior cycle, where the stakes are relatively high, a review of junior cycle (lower secondary) education is now underway. A similar set of key skills, appropriate to this age group, is now being developed. Furthermore, there are plans for a similar age-appropriate approach to primary education. There is some evidence of key skills being introduced in pre-service teacher education and as reviewed subjects are implemented, key skills will form part of the professional development of serving teachers.

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### c. Lithuania – using portfolio assessment for assessing key competences

#### *General competences: curriculum framework*

In Lithuania, the curriculum framework has been oriented towards the development of subject-specific competences and general competences in primary/lower secondary education since 2008 and in upper secondary education since 2011. There are six general competences, which are relevant across the curriculum:

- learning to learn
- communication
- cognitive
- social
- initiative and creativity
- personal competence.

An EU-funded project<sup>10</sup> has provided support for the specification of learning outcomes and the development of assessment instruments for the *learning to learn* competence.

Development of the assessment instruments covered the 2010–2011 period and involved several stages: developing guidelines for the assessment of learning to learn; developing and testing assessment instruments; and, preparing a practical guide on the application of learning to learn assessment instruments.

The development of the learning to learn assessment instrument was oriented towards students of grades 5–6 and 7–8 (11–12 and 13–14 age groups).

The testing of the instruments involved the following stages:

1. Piloting the instruments for validation purposes, which involved testing individual elements of the instrument and using opportunities with different groups (teachers and students from schools participating in the project, teachers and students of schools not participating in the project, students of a higher educational institution that trains teachers). The instrument itself was improved as a result of the testing.
2. Piloting the use of the completed instrument in several schools taking part in the project. The practical guide on the application of the instrument in schools was developed as a result of the pilots and testing.

The practical guide on application of the learning to learn assessment instruments and all learning to learn assessment tools have been made freely available to schools and teachers online and as a paper copy.

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<sup>10</sup> The project is called *Development of Students' Key Competencies in Basic School (grades 5-8)* and also

aims to develop scientific, learning-to-learn and communication in the mother tongue competences.

### *Learning to learn: learning outcomes*

The preparation of the guidelines for the assessment of learning to learn involved unpacking the competence by distinguishing key areas and progress levels of the competence i.e. certain steps that show at what point a student is on his or her way to developing the learning to learn competence.

Within the learning to learn competence, four elements have been identified:

1. Attitude towards learning and willingness to learn
2. Setting objectives and planning activities
3. Organised and targeted learning activities'
4. Reflection on learning activities and outcomes, and self-assessment.

These elements incorporate knowledge, skills and attitudes relating to learning to learn competence.

**Table 1: Definitions of the areas of the learning to learn competence**

| <b>Areas of the learning to learn competence</b>                    | <b>Definition of the area of the learning to learn competence</b>  |
|---|--|
| Attitude towards learning and willingness to learn                  | Understanding of the importance and value of learning and improvement; desire and need to improve. Confidence in one's abilities and belief in the possession of the required resources and skills (the success attitude). Resolution to act, persistence, purposefulness and autonomy in the learning process (involvement of feelings in learning). Sharing of knowledge and experience with others. |
| Setting objectives and planning activities                          | Purposefulness of learning (consideration of needs and opportunities; setting of learning priorities). Consideration of time, importance of goals, and urgency of planning. Planning of final and intermediate results; determination of circumstances that may impact the implementation of the plan.   |
| Organised and targeted learning activities'                         | Provision of an environment appropriate for learning. Selection of appropriate information sources and ability to use them. Effective time management aimed at meeting the set deadlines; adjustment of activities based on any obstacles encountered. Ability to distinguish and manage a variety of learning means and strategies and to choose from this variety.                                   |
| Reflection on learning activities and outcomes, and self-assessment | Use of appropriate self-assessment methods; self-observation and adjustment of the learning process; reflection on the learning process.   |

The development and testing of the assessment tools for students of grades 5 and 6 were based on the aforementioned competence structure. The development and testing of the tools in grades 7 and 8 required focusing more attention on the measurement of skills and attitudes of two areas of the learning to learn competence. Specifically, this made it possible to assess

different aspects identified in 'Attitude towards learning and willingness to learn' and 'Organised and targeted learning activities'. These areas were therefore expanded and 6 elements of the learning to learn competence were distinguished for grades 7 and 8:

**Table 2: Areas of the learning to learn competence for grades 5 and 6 and grades 7 and 8 distinguished during development of the learning to learn assessment tool**

| Areas of the learning to learn competence                           | Names of elements of the learning to learn competence used in assignment booklets intended for students |  |
|---|---|--|
|   | grades 5 and 6  | grades 7 and 8   |
| Attitude towards learning and willingness to learn                  | Why I learn   | I want to learn, I feel responsible, I am self-confident |
|   |   | I can learn from others and together with others         |
| Setting objectives and planning activities                          | What I learn  | I set learning goals and plan my learning                |
| Organised and targeted learning activities'                         | How I learn   | I organise my learning and overcome difficulties         |
|   |   | I learn in different ways                                |
| Reflection on learning activities and outcomes, and self-assessment | I reflect on my progress  | I observe my learning and reflect on it                  |

All the skills in individual areas of the learning to learn competence are described using four levels, i.e. they are defined as skills at: level 1 (*First steps*), level 2 (*Going in the right direction*), level 3 (*Close to the target*), or level 4 (*Competence acquired*). When describing the progress levels, 'student language' was used but they are underpinned by concepts including autonomy, complexity, and frequency scales.

Short descriptions of the levels for self-assessing progress in each competence area for grades 5 and 6 are given as an example:

**Table 3: Elements of the learning to learn competence, their description and levels of element achievements (grades 5 and 6)**

| 1. Why I learn (Attitude towards learning and willingness to learn) |                                     |                            |                            |
|---|-------------------------------------|----------------------------|----------------------------|
| <i>First steps</i>  | <i>Going in the right direction</i> | <i>Close to the target</i> | <i>Competence acquired</i> |



|   |  |   |   |
|---|--|---|---|
| I learn when others urge, encourage, and persuade me. I feel secure when somebody helps me. When I work together with others, I observe more often how others are doing things. | I learn because I have to, but I eagerly learn only what I am interested in. I am self-confident when I have to complete easily understandable tasks. When I work together with others, I try to express my opinion. | I understand that learning is my duty and I therefore try to learn not only things that I am interested in. I usually feel self-confident when I have to perform both usual and new non-complex tasks, and I am not afraid of making mistakes. When I work together with others, I often express my opinion and I help others whenever I can. | I learn eagerly and responsibly, because I like learning and understand that what I learn now will serve me in the future. I am self-confident, I am not afraid of challenges, and I welcome various new tasks. When working together with others, I not only learn from them but also help them eagerly and confidently. |
| <b>2. What I learn</b> (Setting objectives and planning activities)   |  |   |   |
| <i>First steps</i>  | <i>Going in the right direction</i>  | <i>Close to the target</i>  | <i>Competence acquired</i>  |
| I set learning goals and plan learning activities when others help me. I manage to complete tasks on time when others urge me to.   | I consult others to set my learning goals and plan my learning activities. I manage to complete certain tasks on time.   | I try to set my learning goals autonomously and plan my learning activities. I usually manage to adhere to the schedule and complete tasks on time.   | I set my learning goals autonomously. I successfully plan my learning and am therefore able to complete most tasks and tests on time.   |
| <b>3. How I learn</b> (Organised and targeted learning activities')   |  |   |   |
| <i>First steps</i>  | <i>Going in the right direction</i>  | <i>Close to the target</i>  | <i>Competence acquired</i>  |
| I use such learning methods and choose such information sources and learning tools which are offered to me by others.   | With the help of others, I decide what learning method, learning tools, and information sources are best to perform a certain task.  | I try to use different learning methods and I use various information sources. I try to obtain any required learning tools in advance.  | I successfully use various learning methods and choose appropriate information sources. I obtain any required learning tools in advance.  |
| <b>4. I reflect on my progress</b> (Reflection on learning activities and outcomes, and self-assessment)  |  |   |   |
| <i>First steps</i>  | <i>Going in the right direction</i>  | <i>Close to the target</i>  | <i>Competence acquired</i>  |
| When others help and encourage me, I observe my learning progress and sometimes listen to advice given to me and try to follow the advice.                                      | When others help me, I reflect on how and what I achieved in learning and in what areas and how I should improve.  | I autonomously reflect on how and what I achieved in learning; others help me to plan in what areas and how I should improve.   | I autonomously reflect on how and what I achieved in learning and plan in what areas and how I can improve.   |

*Learning to learn: assessment instruments*

Several self-assessment instruments for the assessment of learning to learn are being developed and piloted with schools. These instruments include assessment tasks, a student questionnaire and a teacher questionnaire. The development of the assessment instruments for the learning to learn competence was aimed at making it useful for all participants of the teaching and learning process i.e. both students and teachers. For this reason, the assessment instrument comprises several tools, the purpose of each of which is specified here:

**Table 4: Learning to learn competence self-assessment tools and their purpose**

| Self-assessment tool  | Purpose  |
|---|--|
| Teacher's diagram (Diagram spider's web technique)                    | To help teachers to reflect on their learning to learn competence.   |
| Teacher's questionnaire   | To determine how teachers of the school help to develop the learning to learn competence.  |
| Student's questionnaire (1)   | To determine what students think about the teaching (learning) of the learning to learn competence at their school.  |
| Student's questionnaire (2)   | To help students to define the learning to learn competence acquired.  |
| Student's diagram for grades 7 and 8 (Diagram spider's web technique) | To help students to self-assess the learning to learn competence acquired and to record their progress in this field.  |
| Student's diagram for grades 5 and 6 (Diagram spider's web technique) |  |
| 4 assignment booklets for grades 5 and 6                              | To help students to better understand any areas of the learning to learn competence that need improvement, to set learning goals, and to plan activities necessary for achieving the goals. To help students to observe their progress in the development of the learning to learn competence. |
| 6 assignment booklets for grades 7 and 8                              |  |

The assignment booklets for students contain various learning situations to help students to better understand different aspects of learning to learn. The aim was to ensure that the situations presented to students are neutral in terms of academic subjects; if any assignments are connected with a particular academic subject, they can be easily adapted to any other academic subjects as well. Descriptions of levels of specific learning to learn areas are provided at the end of each assignment booklet. These are intended for student self-assessment. The assignment booklets also contains a final assignment intended for planning further learning goals (students have to specify specific actions that are aimed at strengthening a chosen skill). All the self-assessment tools are intended to be used according to the following procedure:

**Table 5: Recommended sequence of use of the learning to learn competence self-assessment tools (overleaf)**

Determination of the overall situation with the development of the learning to learn competence at school

- Teachers carry out self-assessment of their learning to learn competence by marking levels established in the teacher's diagram.
- Teachers and students answer the questions contained in the questionnaire (1) on the development of the learning to learn competence during lessons.
- Analysis of results obtained and taking of decisions concerning priority areas of improvement of the development of the learning to learn competence at school.

Assessment of the learning to learn competence of students of grades 5 and 6

- Students answer the questions contained in the questionnaire (2) on their learning to learn competence and carry out self-assessment of their competence level, which they record in the student's diagram.
- Analysis of results of student's questionnaires and student's diagrams and taking of decisions concerning the expediency and sequence of use of assignment booklets.
- Students carry out competence self-assessment assignments in their booklets. Students can review their learning to learn competence diagrams and adjust competence levels achieved, if needed.

Assessment of the learning to learn competence of students of grades 7 and 8

Analysis of self-assessment results

- Analysis of assignments completed by students in their assignment booklets.
- Teachers prepare for individual meetings with students or student groups.

Discussion of self-assessment results with students

- Individual meetings with students or student groups are held, if needed.
- Levels marked in diagrams can be adjusted; students' learning goals can be discussed; steps for achieving the learning goals can be planned.

Use of assessment results for improving the educational process

- Determination of strengths and weaknesses of the development of the learning to learn competence.
- Improvement of the educational/learning process. Taking of decisions concerning the required time, methods, and tools. Monitoring of the educational/learning process.

Self-assessment of learning progress

- Students review previously completed assignments in their assignment booklets, carry out self-assessment, and record their progress in diagrams.
- Taking of decisions concerning further steps of development of the learning to learn competence.

Testing the learning to learn tools in schools demonstrated that the following stages are of key importance and require particular interpretational skills on the part of teachers: firstly, the analysis of self-assessment results and, secondly, discussion of the results with students. Particular attention is paid to these stages in the practical guide on application. The interpretation of the results is illustrated by examples of student work, examples of teachers' responses to certain answers provided by students, and their reflections. Teachers and students review the student's progress in developing learning to learn competence in individual meetings. Examples of interpretation, reflection and planned activities are given here:

**Table 6: A teacher's interpretation during analysis of students' answers (the assignment is described in table 6)**

*'When performing an assignment from the 'I reflect on my progress' assignment booklet, Ugnė wrote down that she could advise others on how one should be self-confident when performing assignments. I know that Ugnė is a quiet, shy girl who rarely voices her opinion and who finds it difficult to talk in front of her peers. When I saw her self-assessment, I started to doubt whether I do in fact know Ugnė well. I have never been interested in how she behaves during lessons in other academic subjects. Perhaps she lacks self-confidence only during my lessons? Ugnė and me may have a different understanding of what it means to be self-confident'.*

**Table 7: Sample teacher reflection**

**Teacher's reflection:** *'Having completed the analysis of student answers, I decided to talk to them. I prepared for the meeting and thought of the questions that I was going to ask students. It was important for me to ensure that the students themselves determined what they did not understand and could adjust their answers in their assignment booklets after the meeting. I believe the meeting was successful. Our communication improved and we started to trust each other more willingly'.*

**Table 8: Improvement-aimed activities planned by students from grade 6 prior to and after the individual meeting**

| Learning skill/habit that the student would like to | What the student intends to do in order to improve the learning skill/habit that he/she chose |
|---|---|
|---|---|

|   |  |   |
|---|--|---|
| <b>strengthen</b>   | Activities planned by a student prior to the meeting         | Activities planned by the student after the meeting, which the student formulated together with the teacher   |
| <i>'Do homework in a responsible manner'</i>                          | <i>'Perform more tasks requiring certain responsibility'</i> | <i>'1. I will do my best to complete my homework in full. 2. If I do not know a word or do not understand something, I will look for answers on the internet or in reference books. 3. When I do not understand something, I will write down my questions to teachers in the electronic journal'.</i> |
| <i>'Notice one's mistakes and try to understand and correct them'</i> | <i>'I will correct my mistakes more often '</i>              | <i>'After I complete an assignment, I will self-assess it first. I will consider every assessment criterion listed by the teacher and check my work against these criteria. Only after I complete this check will I say that I have completed the work'.</i>  |

The learning to learn competence diagram for 5-6 grade students

The learning to learn competence diagram is divided into four sections, which portray different skills. Each section is divided into four fields numbered 1, 2, 3, and 4. These numbers, just like steps, show the skill level achieved—that is, the greater the number, the more often you manifest the skill.

***Self-assess each of your skills by colouring the field with the number chosen***

- 1. Why I learn; 2. What I learn; 3. How I learn; I reflect on my progress*

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## Appendix: Thematic Working Group "Assessment of key competences"

The Thematic Working Group has been established by the Directorate-General for Education and Culture as part of the Strategic Framework for European cooperation in Education and Training which sets key objectives and targets to be reached by 2020.

The Group has built its work on peer learning - learning learning together from approaches and practices in participating countries. It has organised meetings, seminars, peer learning activities in Member States and provided examples that are presented in these documents.

The members nominated by Member States and organisations to this group are:

|     |                  |            |   |
|-----|------------------|------------|---|
| Mr  | BEGUIN           | Anton      | Cito Institute for Educational Measurement, The Netherlands         |
| Mrs | BIRKVAD          | Birgitte   | ETUCE   |
| Mr  | BÜKEL            | Ibrahim    | Ministry of National Education, Turkey                              |
| Mrs | CAPACCHI         | Françoise  | Ministère de la Communauté française, Belgique                      |
| Ms  | CERNOSA          | Slavica    | Ministry of Education and Sport, Slovenia                           |
| Mrs | DE COSTER        | Isabelle   | EURYDICE  |
| Mrs | DUNON            | Rita       | Flemish Department of Education and Training                        |
| Mrs | EUTENEUER        | Angela     | Pädagogisches Zentrum, Germany                                      |
| Mr  | FALTYN           | Jaroslav   | Czech School Inspectorate , Czech Republic                          |
| Mrs | FERNANDEZ RIVERO | Marcela    | Ministerio de Educacion, Spain                                      |
| Mrs | GODFREY          | Katrina    | Dept of Education, Northern Ireland                                 |
| Ms  | GRIMA            | Joanne     | Ministry of Education, Employment and the Family, Malta             |
| Mrs | JAMRICOVA        | Eva        | National Institute for Certified Educational Measurements, Slovakia |
| Mrs | LEPASAAR         | Siiri      | Ministry of Education and research, Estonia                         |
| Mr  | MARE             | Pasqualino | European Training Foundations                                       |
| Mrs | MELNIKE          | Eglė       | Education development centre, Lithuania                             |
| Mrs | NUSCHE           | Deborah    | OECD  |
| MR  | O'NEILL          | Hal        | National Council for Curriculum and Assessment, Ireland             |
| Mr  | PAJOT            | Bertrand   | Inspecteur général de l'éducation nationale                         |

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|-----|--------------|----------|--|
| Mrs | PARVEVA      | Theodora | EURYDICE   |
| Mr  | PEPPER       | David    | Education Consultant   |
| Mrs | PILKO CUNCIC | Ivana    | Ministry of Science, Education and Sports, Croatia   |
| Mrs | PSIFIDOU     | Irene    | Cedefop  |
| Mrs | PUSEK        | Danuta   | Ministry of National Education   |
| Mrs | SANCHEZ      | Rosario  | Ministry of Education, Spain   |
| Mr  | SITEK        | Michal   | Educational Research Institute   |
| Mr  | SVECNİK      | Erich    | Bundesinstitut für Bildungsforschung, Innovation & Entwicklung des Österreichischen Schulwesens, Austria |
| Mr  | TSIAKKIROS   | Andreas  | Ministry of Education and Culture, Cyprus  |
| Mr  | SÄÄVÄLÄ      | Tapio    | European Commission, Directorate-General for Education and Culture                                       |