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Assessment of key competences

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1 INTRODUCTION

The key role of assessment in the learning process and in the acquisition of key competences was emphasised by the 2009 Joint Report of the Council and the Commission "Key competences for a Changing World". Based on Member States' reports, it shows that most countries have recently changed school curricula to incorporate at least elements of the key competences, or even the entire European framework in some cases, and that priority is now moving to how to implement these reforms by addressing e.g. teacher education, the development of learning materials, and assessment methodologies[1].

Significant work remains to be done to translate policy into practice. The report concludes, inter alia, that "most current assessment methods have a strong emphasis on [only] knowledge and recall and do not sufficiently capture the crucial skills and attitudes dimension of key competences. Also the assessment of transversal key competences and the assessment in the context of cross-curricular work appear inadequate."[2] The report's conclusions refer to the growing use of complementary methodologies (such as portfolios, peer assessment, project work etc) and suggests that these should be examined and developed further. This request was also made at the December meeting of Directors-General for Schools in Stockholm.

This paper is a first response to this request. It is intended to give some provisional insights into challenges and policy trends that are currently observed at EU level, and to suggest some directions for future work to deepen and reinforce the analysis. The paper draws on the peer learning undertaken by the Cluster 'Key Competences and Curriculum Reform' on the links between curricula and assessment, and on independent work conducted by the expert advisor to that Cluster. It:

- outlines the different purposes of assessment policies and practices and the kinds of learning they are designed to reveal;
- discusses the challenges systems face when trying to capture all the dimensions of key competences through assessment – in particular creativity;
- shows examples of how assessment processes are being extended to cover explicitly a wider range of key competences, and;
- looks at how to harness assessment to support high-quality teaching and learning.

[1] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: "Key Competences for a changing world: Progress towards the Lisbon Objectives in Education and Training: Analysis of implementation at the European and National Levels. {COM(2009) 640}

[2] See Page 5 of the report.

The spotlight in this paper is on assessment as 'the process of making judgements about individual learner's progress and achievements'[3] rather that on the evaluation of education programmes, school performance or systems in general.

The paper does not attempt to give systematic guidelines on how to assess each of the key competences but rather identifies issues that are common to all of them. It offers an overview of the current situation and some examples of good practice as the basis for discussion and exchange of experience.

The Commission seeks the views of Directors-General for school education on these issues, particularly on the priorities for the work of the new Thematic Working Group Key Competences, which will start work in September 2010. A Policy Handbook on the assessment of key competences is envisaged as one of its first outputs.

[3] Looney, J. (2009), "Assessment and Innovation in Education: OECD Working Paper No. 24," Paris; OECD/CERI, page 10.

2 WHY ASSESSMENT?

2.1 The European Framework on key competences for lifelong learning

Since 2006, lifelong learning has been supported by the European Reference Framework of Key Competences for Lifelong Learning.[4] This is designed to help Member States prepare all of their young people for adult life in a changing world, and ensure that all adults are offered the means to up-date their skills and reap the social and economic benefits of the knowledge society.

The table below summarises the key features of the European Framework.

2.1.1 Table: Key Competences

<table>
<tr><th>The key competences are</th><th>They consist of</th><th>And contribute to</th></tr>
<tr><td>1. Mother Tongue</td><td rowspan="8">Knowledge

Skills

Attitudes</td><td rowspan="8">Personal fulfilment

Social Inclusion and active citizenship

Employability</td></tr>
<tr><td>2. Foreign Languages</td></tr>
<tr><td>3. Mathematical competence and basic competences in science and technology</td></tr>
<tr><td>4. Digital Competence</td></tr>
<tr><td>5. Learning to Learn</td></tr>
<tr><td>6. Social and Civic Competence</td></tr>
<tr><td>7. Sense of initiative and entrepreneurship</td></tr>
<tr><td>8. Cultural awareness and expression</td></tr>
<tr><td colspan="3">Key competences are overlapping and work together. They are underpinned by "process dimensions" which obtain when competences are applied in real-life situations. These process dimensions are: critical thinking, creativity, problem solving, initiative, risk assessment, decision-taking and management of one's own feelings. They are applicable in many situations; multifunctional so that they can be used to achieve several objectives, accomplish different kinds of tasks and solve different kinds of problems.</td></tr>
</table>

Three features in the European Framework of Key Competences pose challenges for teaching, learning and assessment:

- Each key competence is made up of a combination of knowledge, skills and attitudes, appropriate to the context. In the European Framework, "attitudes" are taken to mean the capacity to apply knowledge and skills in real-life situations.

- All eight key competences are underpinned by the process dimensions listed in the table above.

[4] Recommendation of the European Parliament and of the Council on key competences for lifelong learning (December 2006), **http://ec.europa.eu/education/lifelong-learning-policy/doc42_en.htm**.

- While many of the key competences are close to traditional school subjects such as Mother tongue, and Maths and Science, others – such as Social and Civic competences, Initiative and Entrepreneurship - go beyond traditional subject boundaries.

An approach to teaching and learning which is based on key competences shifts the focus of attention away from inputs such as programme content, time, materials and methods, and on to the outcomes of the learning process: what a learner knows, understands and is able to do after completion of learning.

This implies developing individualised approaches to teaching, learning *and assessment.* The following table summarises the some of characteristics of the learning environments that support the development of key competences:

2.1.2 *Table: Key Competences and the Learning Environment*

In the school or training institution:	***The teacher/trainer:***	***The Student:***
Leaders and managers have a shared vision of key competences and make practical commitments to supporting staff and learners in achieving them. Staff, manager and learners work in an atmosphere of openness, trust and collaboration. Positive and fruitful interaction with external partners, including the local community, is fostered. There are structures and procedures that support staff and learners in using a wide variety of teaching and assessment methods, including modern media and IT A learner-centred ethos with high expectations is promoted which supports for all learners in fulfilling their potential.	Consciously addresses the development of positive attitudes and creativity, as well as knowledge and skills. Makes connections between learning areas or disciplines; integrates learning, individually and with colleagues. Creates opportunities for learning that takes students into authentic contents that are relevant for students' life now and in the future; Develops learning plans with students which respond to their needs and allow for tracking their progress. Uses a wide variety of methods of teaching and assessment that encourages the learner to take an active part in monitoring their own progress, and to view mistakes as useful feedback rather than failure.	Has an active role in decisions about the content, process, and assessment of learning; Works alone and in groups, within and across traditional subject/craft/ vocational boundaries. Fully engages in applying their learning in their lives outside the immediate learning context. Shares responsibility for their learning Participates fully in activity-based methods, by asking questions, taking risks and using mistakes as useful feedback.

2.2 Impact of assessment on the development of key competences

Research has shown that the influence of assessment extends both to individuals and to education and training systems in general.[5]

[5] Black, P.J. and Wiliam, D. (1998) "Assessment and Classroom Learning," Assessment in Education: Principles, Policy and Practice, 5 (1). Also Looney, J. (2009) "Assessment and Innovation in Education: OECD Education Working Paper No 24," Paris: OECD/CERI pages 11 – 16; and ACCAC (2003) "The ACCAC report on the value of the key skills tests: the value of tests I n the assessment of key skills qualifications," reproduced in QCA/ACCAC/CCEA (December 2003) Review of the September 2000 Key Skills," London: QCA.

The role of assessment has also been a recurring theme in Peer Learning Activities (PLAs) of the Cluster Key Competences and Curriculum Reform[6]: the PLAs indeed have shown how any curriculum reform will remain incomplete if assessment regimes and teachers' own competences have not been addressed.

For the learner, assessment shows what is valued as a learning outcome. The ways in which these outcomes have been agreed upon, described and assessed, determines what the learner is motivated to achieve. At best, assessment can help students 'learn to learn' and lays the foundations for lifelong learning. It can increase awareness of one's learning process and learning needs, and help overcome obstacles in order to learn more effectively. Assessment can help people learn to gain, assimilate and process new knowledge and skills, help them understand their preferred learning styles and become autonomous and confident learners.

Assessment leading to qualifications may also help (or hinder) the learner to communicate his/her real competences when seeking further learning opportunities or employment.

However, there is also evidence that some assessment practices may damage learners' motivation and self-esteem to the extent that some young people and adult learners abandon their studies; and that people who are 'low-achievers' may feel the worst effects.[7]

For the teacher, assessment has a powerful impact on what and how is taught. This can be both beneficial, using assessment as a tool for clarifying learning outcomes and future goals, and detrimental, narrowing learning to the content and methods likely to be tested ("teaching to the test"). The Peer Learning Activities undertaken by the Cluster have provided insights into how the processes of teaching, learning and assessment are so closely intertwined that any policy or strategy which impacts on one of these elements, will also affect the others. This means that decisions made in relation to assessment have a major influence on how the key competences are taught, and therefore, on what learners learn.

[6] The Cluster 'Key Competences- Curriculum Development' has undertaken Peer Learning Activities on the implementation on key competences: the role of assessment has been identified as key in all of these. See: **www.kslll.net**

[7] Black find ref

3 PURPOSES AND METHODS OF ASSESSMENT

3.1 Overall purposes of assessment: from international comparisons to individual level support for learning

The words 'assessment' and 'evaluation' are sometimes used interchangeably. In this paper, assessment is taken to relate to the competences of the individual learner, and evaluation to institutions or systems, often based on aggregated assessment data.

Contexts, functions and uses of assessment can be schematised as follows:

3.1.1 Table : Assessment and evaluation

Context	Function	Uses
System	International comparisons; National standards; Accountability.	Policy development, system monitoring
Institution	Monitoring against national standards; Internal quality assurance; Developing internal policies and procedures.	Feed into national data-gathering processes; Feedback to tutors, trainers, teachers, learners, parents.
Learner	Monitor achievement against national standards and curriculum objectives; diagnose strengths and weaknesses; track progress.	Feedback to learner on progress; feedback to tutors and teachers on success of teaching approach.

As regards system level evaluations, the Eurydice study on national testing emphasises that national level tests – in addition to their function of awarding grades or certificates - have become an increasingly important tool for Member States to monitor their systems. However, the picture is complex: evaluation policies vary in subject coverage, frequency of assessment, use of sampling or universal assessment, and how the results are used to feed back to schools and the systems as a whole. Also, the study concludes that out of the eight key competences set out by the European Framework three, namely Communication in the Mother tongue, communication in foreign languages, and mathematical competences and basic competences in science and technology, are the most commonly assessed in national tests. By contrast, in many European countries the key competences such as Learning to learn or Social and civic competences, which usually relate to more than one subject, are not generally assessed in national evaluations.

It is therefore important that those competences not covered by national tests are supported by other forms of assessment, and that for the purposes of policy decisions the limited scope of nationals tests is completed by other sources of information such as research and dialogue with stakeholders that can provide valuable information on how all objectives set out in the curriculum are being attained.

3.2 Summative and formative assessment

Many difficulties associated with assessment arise from a lack of clarity about what the various forms of assessment and evaluations are intended to, and can realistically, achieve[8]. One way of clarifying these issues is to consider the distinction that is often made between assessment carried out for summative and formative purposes.[9]

The main purpose of 'summative assessment' is "to provide summary statements of student achievements and capabilities."[10] It usually takes place at the end of a particular educational stage.

'Formative assessment' sometimes simply refers to assessment which takes place at the same time as teaching or which provide learners with feedback on test results.[11] However, it can also mean the frequent, interactive assessment of student's understanding and progress to identify learning needs and adjust teaching appropriately.[12] This definition emphasises the role of assessment as shaping the teaching and learning process: assessment is an integral part of teaching and learning.

The distinction between these purposes is not always clear-cut: sometimes they overlap, and the same assessment process may be used for both formative and summative functions. Preparing portfolios and projects, for example, generates information during the teaching and learning process which can provide immediate feedback for the learner. Yet the same process also produces work that contributes to a final mark, grade and, sometimes, a qualification. Similarly, often the final marks given in schools are not the result of an-end-of-year test: they can also derive, in part, from work which the learner has been engaged in over a long period of time.

It may therefore be more useful to think of the distinction between summative and formative assessment as a question of emphasis, rather than as an absolute divide.

3.2.1 Table: Features of Assessments for Summative and Formative Purposes

Summative purposes	**Formative purposes**
What Does it Do?	
Sums up learner's performance. Gives delayed feedback.	Gives immediate feedback on teaching and learning. Diagnoses strengths and difficulties.
How is this done? (methods)	

[8] Newton, Paul E. (2007) 'Clarifying the purposes of educational assessment', Assessment in Education: Principles, Policy & Practice, 14:2, 149 -170.

[9] Eurydice (2009) National Testing of Pupils in Europe: Objectives, Organisation and Use of Results, Brussels: Education, Audiovisual and Culture Executive Agency, http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/109EN.pdf

[10] Looney, J. (2009), "Assessment and Innovation in Education: OECD Working Paper No. 24," Paris;
[11] Assessment Reform Group (2002) "Ten Principles: Research-Based Principles to Guide Classroom Practice," http://www.assessment-reform-group.org/publications.html
[12] Looney (2008) op. cit., page 1.

Standardised tests. Other tests and examinations.	Structured verbal interaction between teacher and learner. Learner self-assessment.
Projects, portfolios of work, oral interviews and presentations, observation of learner's performance on tasks, examination of items made.	
When does this happen?	
At the end of a programme or period of learning	Day-to-day, during the teaching and learning process.
Projects, portfolios etc carried out on an on-going basis.	
Who has responsibility for assessing?	
Assessor(s): may be class tutor/teacher, or external assessor, or both.	Learner and teacher/tutor jointly.
How are results reported?	
Marks, grades, profiles and records of achievement.	Verbally. In informal written records and forms. Often not formally reported.
What are results used for?	
Compare and discriminate learners' performance. Select learners for courses or classes. Provide learners' qualifications. Provide information for employers and higher education (screening). Evaluate success of programme or institution: accountability.	Track learners' progress. Identify learners' strengths and difficulties. Identify strengths and weaknesses in teaching. Check learner's progress in relation to goals or criteria.

Summative assessments produce judgements which come from the outside; formative assessments often include the learner as an active participant. Summative judgements give results which are usually expressed in quantitative terms and are often on public record; formative results may not be recorded at all, or if they are, may be noted down informally or in locally-designed formats designed to support private communication between teachers and learners.

Formative results may be useful to only a few people: the teacher and learner, to parents and possibly also school managers and some other teachers. This is mostly a private process, carried out with the immediate needs of the learner in mind. Formative results may be useful to only a few people: the teacher and learner, to parents and possibly also school managers and some other teachers. This is mostly a private process, carried out with the immediate needs of the learner in mind. However, it is important to note that many countries organise national level tests for formative purposes. In France, for instance, there are diagnostic tests (optional for primary education, obligatory for lower secondary) the purpose of which is to identify pupils in the need of extra support.

In contrast, results from summative assessments of individuals' learning at the end of the education stage have a significant impact on students' education and training career: they are used to award certificates, or to make important decisions on progression, and, in some countries, to stream students into different tracks of education and training within school or even between different school types. While in most of the cases national summative tests are taken at the end of lower-secondary education, in the Netherlands, for instance, national tests at the end of primary education are used to inform parents about the most suitable forms of secondary education for their children.

Also, results of national summative assessments are increasingly used for monitoring and evaluating schools or education systems as a whole. According to Eurydice[13], some half of the European countries use standardised tests to monitor and evaluate schools, or the education systems as a whole. The results are often used in conjunction with other indicators such as socio-economic data on the area served by the school.

[13] Eurydice (2009) National Testing of Pupils in Europe: Objectives, Organisation and Use of Results, Brussels: Education, Audiovisual and Culture Executive Agency, http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/109EN.pdf

4 THE CHALLENGES OF ASSESSING KEY COMPETENCES

4.1 The challenge of capturing all the dimensions of key competences

The European Key Competences Framework is based on the understanding that in order to function effectively in daily, learning, working and community life, individuals need certain knowledge and skills. However, the concept of competences goes further and encompasses the attitudes that enable individuals to make full and appropriate use of their knowledge and skills. This makes competences a much more dynamic and personal concept than was common in ideas of teaching and learning until quite recently.

The Framework therefore has a strong emphasis on the attitudinal dimension of each key competence and also on the "process dimensions" of critical thinking, creativity, initiative, problem solving, risk assessment, decision taking that are crucial for personal well-being, active citizenship and success in the world of work**.**

The Framework also emphasises that key competences overlap, and support each other: it is the combination of key competences that will help people to cope with complex situations.

The following extracts from the full definitions of key competences show how key competences are a wider concept that traditional subjects, how attitudes and process dimensions (such as creativity and problem etc) are embedded. It also illustrates how key competences are interlocking and support each other:

4.1.1 Table 3: Dimension of key competences

Key competences and how they integrate knowledge, skills, attitudes creativity and problem solving and interlock.	
Mother Tongue, and **Foreign Languages**	Languages require a solid knowledge of vocabulary, grammar and understanding of different functions of languages. But one need to skills to adapt communication to different situations and, as attitudes, to appreciate the aesthetic qualities of languages, to interact with others in intercultural and –linguistic environments. Languages contribute in particular to **creativity, and management of one's own feelings and thus social and personal well-being**. Languages skills are obviously both a pre-requisite for further learning and develop in the course of acquiring and applying other key competences.
Mathematical competence and basic competences in Science and Technology	A sound knowledge of numbers, terms and concepts and mathematical principles is accompanied by skills to apply Mathematics and science in everyday situations. Attitudes include the e.g; the willingness to look for reasons and to assess their validity – this contributes in particular to **problem-solving**. In science, the basic knowledge of natural world will lead to skills to **draw evidence-based conclusions** and develop **critical thinking** and respect of sustainability and interest in ethical issues related to scientific and technical progress.
Digital competence	The basic skills in using ICT and digital services require both knowledge of the role, nature and opportunities new media provides for personal, social lives as well as work and the basic skills of using the technology. However **critical and reflective attitudes** are essential; as well and engagement in social communities, and professional networks and the creative use of modern media.
Learning to Learn	While knowledge on ones own learning styles and options on career is indispensable, skills include both "study skills" such as finding, assimilating and synthesising information and skills related to planning, organising learning autonomously and in groups. **A problem-solving** attitude is essential to handle

	obstacles as well as curiosity and **motivation to pursue learning** throughout one's life.
Social and civic Competences	Knowledge on and understanding on of the codes of conduct in societies, work organisations and on concepts such as democracy and humans rights pave way to skills of **communication constructively, show tolerance, negotiate and resolve conflicts**. Attitudes include showing **responsibility and involvement** of civic activities and decision-making at all levels.
Sense of Initiative and entrepreneurship	The knowledge-component of this competence includes understanding of the working of economy and enterprises. However, skills such as planning, organising, managing, communicating and the ability to work both individually and in teams connect this competence in effective learning. Similarly, attitudes related to entrepreneurship initiative, **pro-activity and innovation** serve both for personal and social lives, and the basis for careers as an entrepreneur.
Cultural Awareness and expression	Cultural knowledge includes awareness of the role of cultural heritage at all levels; understanding the richness of Europe and its societies. Skills relate to enjoying and expressing oneself through art but also to realise the social and economic potential of artistic activity. Attitudes include the **appreciation of creativity** and an open attitude towards diversity.

For assessment, this poses three challenges:

- How can assessment capture students' capacity to apply knowledge in authentic situations that require using a broad combination of key competences?
- How can assessment capture and support creativity and problem solving?
- How can assessment include the element attitudes and what issues then may arise?

These are important questions as recent studies[14] and reports from Member States[15] confirm that while all European education and training systems already have in place structures for teaching, assessing, recording and accrediting the knowledge and skills components of some or even all key competences, assessing the application of knowledge and skills remains a challenge: the dimension of attitudes, critical thinking and creativity are less frequently included in assessment regimes.

A promising and widespread response to the first question lies in broadening the scope of summative assessment for formal purposes to cover more ways of gathering evidence. The use of portfolios, projects and performance tasks, for instance, can help making assessment more authentic. In particular the use of ICT has an enormous potential not only in administering assessment but in helping to develop summative assessment to include tasks where students have work on the basis of large amounts of information which would be impossible in a paper-based assessment (eg handling a database) or combine information from the internet and other media to prove a mastery of competences that go beyond traditional subject boundaries.[16] Also, ICT provides a useful

[14] Key Competences in Europe: Opening Doors for Lifelong Learning Across the School Curriculum and Teacher Education; Final report 2007/2090/001/001 TRA TRSPO. CASE – Center for Social and Economic Research

[15] Joint Report of the Council and the Commission "Key Competences for a Changing World" COM(2009)640 final

[16] F. Scheuermann & A. Guimares Pereira (2008): “Towards a Research Agenda on Computer-based Assessment - Challenges and Needs for European Educational Measurement”. JRC Scientific and Technical Reports 23306 EN.

tool for continuous assessment for formative purposes. In all these areas good examples exist (see Chapter 5).

Harnessing assessment to support creativity in particular poses a challenge for schools, teacher and trainers. Researchers[17] agree that in order to support creativity, learning environments should be permissive, safe and supportive. In such environment teachers themselves pass the message that creativity is worth pursuing and promote cooperative learning that is relevant to students' life experiences. Students feel rewarded and encouraged and have a sense of responsibility and ownership. While they take the role of discoverers, they are supported and guided in ways that helps them succeed rather than seeking out and punishing failure[18].

Supporting creativity in schools does not mean abandoning traditional subjects altogether. But it does imply more inter-disciplinary learning through cross-curricular work. While the division into subjects allows for the development of knowledge and skills related to a certain discipline, cross-curricular work can allow for broader, trans-disciplinary thinking, looking at things from different perspective and making new connections: all this is a pre-condition for creativity and innovation[19].

If creativity is to be promoted, it has to be valued – both in the macro level of evaluations for accountability, and in particular at micro level of individual assessment that takes stock of student progress. Competitive assessment that is often based on comparing students' performance is often centred around “right answers” and has been rightly criticised for not supporting, and indeed stifling, creativity. On the other hand, assessment can be built on developing "mastery"[20]. There the emphasis is on self-improvement and providing students feedback for doing this effectively. The latter applies also to day-to-day interaction between teachers and students. If teaching and assessment is about looking for "an answer that is known before the question is posed"[21] instead of making students to investigate solutions themselves, there is not much room for creativity. On the other hand, intentional and systematic use of formative assessment can be an effective tool to support creativity.

Assessing attitudes relates to personal attitudes or dispositions and so raises ethical issues as they are very personal and may manifest in different way in different social contexts.

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[17] See for instance: Amabile, T. M., and N. Gryskiewicz. "The Creative Environment Scales: The Work Environment Inventory." Creativity Research Journal 2 (1989); Woods, Creativity in schools: tensions and dilemmas, 2002.

[18] Simplicio, J. S. C. (2000). Teaching classroom educators how to be more effective and creative teachers. Education, 120(4), 675-680.

[19] Craft, 2005: Creativity in Schools: Tensions and Dilemmas

[20] Beghetto, R.A. (2005); quoted in "Innovation and Creativity in European Education and Training Systems. Fostering Creative Learning and Innovative Teaching". Literature review by A. Ferrari, R. Cachia and Y. Punie. JRC Technical Note, 2009.

[21] Malaguzzi, 1987, quoted in "Innovation and Creativity in European Education and Training Systems. Fostering Creative Learning and Innovative Teaching". Literature review by A. Ferrari, R. Cachia and Y. Punie. JRC Technical Note, 2009.

These arise especially when assessments are carried out for summative purposes, where judgements about attitudes and values which are deemed to have demonstrated can have a larger impact.[22] Some teachers question the feasibility of making reliable assessments of attitudes without having deep background knowledge of the individual's circumstances, and some even question their right to make such judgements. This ethical question has important implications for the relationship and power dynamics between the teacher and the learner, particularly in the context of high-stakes assessments, such as end-of-year results or the awarding of national qualifications.

At the level of school education, many countries' assessment guidelines make it clear that attitudes or dispositions mean work habits, curiosity and persistence – essential elements of the 'Learning to Learn' competence – and are part of the criteria for summative assessment. Qualifications including personal statements or profiles have been in use for a long time. Some of these are explicitly orientated towards providing information of interest to employers.[23]

Projects, presentations, portfolio-building and other activities mentioned in section 5 all give opportunities the opportunity to develop the attitude dimension of competence and positive attitude towards learning in general. These same activities also provide an opportunity for learners to demonstrate their progress and achievements; and for their teachers and other assessors to observe and assess those achievements; and also, to identify where more work is needed for the learner to achieve any of the key competences.

The most important tool, however, for developing the attitudinal dimension of competences as well as creativity, critical thinking and problem solving, is formative assessment. It is a powerful resource because it:

- involves the learner in setting objectives, planning and assessing their own progress;
- provides immediate feedback for the learner and also the teacher, which can be used to adjust the teaching and learning process as needed;
- broadens the range of capacities that can be developed and assessed by promoting knowledge and skills and also, many more which are more difficult to define and capture;
- can generate objective evidence of learners' progress and achievements that emerge from the immediate teaching and learning context.

The following example shows these principles in action. The Creative Learning and Assessment Project illustrates how both the attitudinal dimensions of key competences, and creativity and problem solving can be systematically developed and, also, embedded in formative assessment processes at local level.

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[22] 'Implementation and Assessment of Key Competences' Cluster Key Competences and Curriculum Reform; report on a peer learning activity in Prague, December 2009. **http://www.kslll.net/PeerLearningActivities/PlaDetails.cfm?id=98**

[23] See Employability Skills Profile in Australia; the Employability Index (?) in the US; etc.

4.1.2 Example: The Creative Learning Assessment Project, England[24]

1. Project Aim:
To develop an assessment model that enables teachers to
- understand and assess creativity in learning;
- develop curriculum and pedagogical strategies to value and promote creativity;
- have a positive influence on teaching and learning.

2. Development strategies
The team examined different subject domains for opportunities to work on and collaborate on fostering creativity. They discovered that in assessing creativity, they were addressing a multi-dimensional construct that included both independent strands and abilities, and generic skills that recurred in many different contexts.
They decided to focus on projects and real-life situations as vehicles for the teaching and assessment of creativity.

3. Identifying the construct
Teachers and researchers identified a range of dimensions on which to focus the teaching and assessment: features of creativity on which they were interested in tracking children's progress. Some of the traits and behaviours they assessed included:
- confidence; independence; enjoyment; collaboration; communication;
- experimentation in play; use of many and varied strategies in play;
- knowledge and understanding appropriate to the situation; reflection and evaluation.

4. Observation framework
Teachers and researchers then developed an observation framework based on the dimensions listed above. The framework identified behavioural elements to provide evidence of children's progress under each heading.
For example, evidence for 'collaboration' and 'communication' was if a child was seen to:
-work/play as part of a team; contribute to a discussion; make suggestions; listen and respond to suggestions and instructions;
- persevere with a task; overcome problems with a task or situation; communicate and present ideas.
Teachers and researchers then developed scales of progression and development for these dimensions, which were divided into 5 levels.

5. Implementing the method
Having identified suitable tasks and projects, teachers then collected data under the framework headings, on a day-to-day basis, as the children were engaged in their regular tasks and activities. They gathered evidence to inform their judgements of how the children were progressing in relation to the scale. Evidence included both judgements on products – what the children made and did – and also on the processes – how they carried out their activities and tasks.

6. Triangulating the judgements
The assessments of individual teachers were moderated by groups of other teachers.
Evidence of children's progress and achievements was also presented to school

[24] http://www.clpe.co.uk/researchandprojects/research_01a.html

inspectors.

The project thus captured evidence both on learners' progress, and on their final achievement level.

This project has taken a descriptive, qualitative approach to assessing creativity at an individual level. It shows that it is possible to define qualitative indicators and levels to describe progress and record it even in an abstract field such as creativity that is often less visible in high-stakes assessment.

Another example from Austria[25] shows how formative assessment can be used as a normal part of the teaching and learning process. This shows how mathematics can support the development of positive attitudes, problem solving and communication skills:

4.1.3 Example: Learner-centred Mathematics in Austria

The objective of this approach to teaching mathematics addresses not only knowledge and skills, but also the development of social and inter-personal skills, as well as the ability to discuss and defend concepts, make presentations to the group and offer support to each other in the process of learning.

Students work on particular concepts together in small groups. Several strategies are used to develop the process dimensions of competence, in addition to the knowledge and skills:

- students collaborate with minimum intervention from the teacher;
- students who have grasped a particular concept may be asked to explain this to the class – or in small groups to other pupils;
- pupils make choices about how to choose and structure their activities;
- students summarise their own learning;
- students give and receive feedback to and from the teacher at all stages.

These activities both strengthen and test students' understanding of subject matter.

The two examples above show that even if assessing attitudes and process dimensions of key competences may pose both ethical and technical questions, there a number of ways of incorporating them into existing teaching and assessment methodologies.

4.2 What place for levels in assessing the key competences?

One of the most important aims of the key competences framework is to support Member States' work in ensuring that by the end of initial education and training young people

[25] Key Competences cluster (2007) Report on Peer Learning Activity in Flanders page 8, 9.

have developed the key competences to a level that equips them for adult life and which forms a basis for further learning.[26]

The detailed descriptions of the knowledge, skills and attitude of the eight key competences, express that 'level' - the finishing point that learners should achieve by the end of their time in compulsory schooling; or as adults engaged in second-chance lifelong and life-wide learning opportunities.[27] However, the framework does not describe the different stages through which the learners pass.

Of course, teachers and trainers in practice 'unpack' the key competences into levels or smaller entities for the purpose of planning teaching and learning and monitoring progress, including defining the learning outcomes that students are expected to achieve in the course of developing key competences.

It would therefore be helpful to clarify the different options available for describing levels or stages of learners' progress, and also to indicate in what contexts and for what purposes these are most useful.

In this context, several European or other international frameworks have already defined levels for certain elements of key competences, either for the purpose of developing and comparing qualifications (the European Qualifications Framework) or in basic skills that are part of the mother tongue and mathematics and science competences (PISA, PIRLS, TIMMS) and foreign languages (the Common European Reference Framework for Languages).

Although the European Qualifications Framework (EQF) "is not an instrument for directly documenting individual learning progresses"[28] it has some useful features which are relevant to the Key Competences. One of these is that it uses learning outcomes to describe levels. Learning outcomes are an important tool in supporting the shift towards competence in European education and training.[29] They are especially useful for setting goals and describing clearly "what a learner knows, understands and is able to do on completion of a learning process."[30] Although learning outcomes have an increasingly prominent role in defining qualification standards, curricula and quality assurance mechanism and certification approaches[31], recent Cedefop research on learning outcome

[26] Recommendation (2006) op. cit., page 2.

[27] It is always a good time to learn. COM(2007) 558 final

[28] European Commission (2008) "Explaining the European Qualifications Framework for Lifelong Learning," Luxembourg: Office for the Official Publications of the European Communities, page 7.

[29] Cedefop (2009) The shift towards learning outcomes.

[30] European Commission (2008) "The European Qualifications Framework for Lifelong Learning," Luxembourg: Office for the Official Publications of the European Communities, page 11

[31] Cedefop, 2009 several studies

approaches in VET curricula in different education and training systems notes that their use in assessment has so far been limited.[32]

The EQF learning outcomes are broad in that they include many dimensions of learning which have not traditionally featured in national qualifications, including autonomy, independence and responsibility. Although not identical to the key competences, there is a lot of common ground. This makes the EQF approach to learning outcomes a useful reference point for assessing the wider dimensions of the key competences model.

Another useful reference point is the 'The Common European Reference Framework for Languages' (CERFL), developed by the Council of Europe. The CERFL supports teaching and learning by describing language proficiency at different levels. It can be used for programme planning or for language assessments and is also used to describe levels of achievement in language qualifications. The fact that it relates directly to one of the key competences, and is also expressed in terms of learning outcomes, makes it of special interest for the assessment of key competences.

Furthermore, the CERFL levels of achievement include many aspects of communicative competence that relate to the way in which the learner demonstrates the skill, and the appropriateness for the context. This approach coincides directly with the requirements of key competences assessment, especially in how different levels are specified and recorded.

Other international assessments including PISA, PIRLS TIMMS and PIAAC have different ways of expressing achievement. Some of these include the use of criteria which define levels, mostly of selected aspects of literacy and numeracy.

Can these international levels provide useful criteria against which the different key competences can be assessed?

With the exception of CERFL, international frameworks are first of all designed to support the testing of large-scale populations, with the primary aim of informing policy. Secondly, attainment levels designed for this purpose are often too wide for the purpose on guiding teaching and learning for individual learners. Third, for the purpose of defining levels for the eight key competences, the scope of these indicators is limited: they cover only some aspects.

4.3 Defining levels of key competences at national and local levels

In the process of implementing competence-based curricula some Member States have developed national frameworks which describe levels of achievement in important areas related to key competences: creativity; problem solving; managing information, working with others. The innovative aspect of these approaches is that they make objectives more explicit both for the learner and the teacher.

[32] Cedefop, 2010. Learning outcomes approaches in VET curricula. A comparative analysis of nine European countries.

The following two examples illustrate how assessment can capture some dimensions of key competences, and describe them in levels of progression.

4.3.1 Example: Thinking Skills and Personal Capabilities Framework, Northern Ireland

The framework contains five strands: 1) Managing Information and Thinking, 2) Problem-Solving and Decision-Making; 3) Being Creative; 4) Working with Others; and 4) Self-Management.

This framework is designed to be applied across the curriculum. It integrates a range of different types of thinking skills and learning dispositions with collaborative learning (working with others) and independent learning (self-management and taking responsibility). It is based on the idea that when thinking skills are developed in this broader context, pupils acquire a deeper understanding of skills and concepts and are better able to apply them in a range of contexts.

Learners' progress is expressed in terms of task complexity and learners' mastery of the task. Progress maps define progress from Foundation level to Key Stage 3. In this way, work generated and judgements made at school level are aligned with national structures.

Although there is no one-to-one correspondence between this initiative and any single key competence, the content and processes clearly support the creativity dimension of key competences and are also relevant to specific competences such as mother tongue (especially its communication dimension) and social and civic. Significantly, this framework also shows how the assessment of wider dimensions of competence can be addressed across the curriculum, and linked with the wider national assessment criteria.

Work to define levels for key competences has been launched in the Czech Republic. The Czech key competences are very similar to the European ones, and also define levels that pupils should achieve by the end of compulsory schooling. The purpose of defining levels is to support the planning of learning programmes and the monitoring of learners' progress.

The work is being done nationally and within schools. At the national level curriculum a handbook has been produced with examples how the key competences can be described in precise learning outcomes at grades 5 and 9. At the level of schools, individual teachers and students define detailed learning outcomes for planning daily activities and monitoring progress of individual students.

4.3.2 Example: "Unpacking" key competences in the Czech Republic

In some schools of the Czech Republic, the key competences are addressed in the course of the self-evaluation process with pupils, teachers and parents. Pupils have a personal self-assessment booklet that sets out a structured approach to the development of competences, specifying goals and stages of progress. This provides a focus for a three-way dialogue between the actors. This is used as a tool during assessment and becomes part of the learning process for all. In this way, formative assessment of learners' progress towards the expected learning outcomes, and towards competence, becomes embedded in the learning environment at school.

A similar project is underway in Ireland. The five Key Skills (Communication; Information Processing; Critical and Creative Thinking, Working with Others; Being Personally Effective) are being turned into more specific learning outcomes which teachers can then use for planning effective teaching.

The 'Thinking Skills and Personal Capabilities Framework' and the other examples shown above demonstrate that it is both possible and necessary to help teachers and school implement key competences by breaking them into smaller entities or levels. Otherwise, key competences risk remaining too abstract and wide for concrete teaching, learning and assessment processes.

The definitions of levels or more specific learning outcomes that aim to track progress towards developing key competences must, however, meet several conditions:

- Encompass as many dimensions as possible of key competences: knowledge, skills, attitudes, creativity and problem solving. This will facilitate the monitoring of learners' progress and give the necessary feedback for defining further progress goals, while retaining coverage of the different aspects covered by the key competences concept. Making all these aspects explicit raises their value, too.

- Support a 'spiky' profile of progress. A 'spiky' profile means that individuals tend to advance more or faster in some aspects than others, and the assessment of levels should take account of this, and not hold back a learner for this reason.

- Support the tracking of progress in small steps that serve pedagogical purposes and allow for frequent, on-going and specific feedback.

5 HOW TO HARNESS ASSESSMENT TO SUPPORT THE DEVELOPMENT OF KEY COMPETENCES?

5.1 How to broaden national summative assessments to cover key competences?

The 2010 Joint Report of the Commission and the Council shows that there is a growing interest among Member States in harnessing assessment - both summative and formative – for the development of key competences. While summative assessment most often focuses on subject-related competences, many countries such as Austria, Germany and Denmark include inter-disciplinary work as part of their final diplomas in order to promote a wider set of key competences. Interesting developments are underway in using ICT in assessment for widening the scope of skills measured. Similarly, a number of countries have created systems for summative assessment to develop differentiated feedback to schools and teachers in order to help them improve.

The Joint Report concludes that, despite positive developments in several Member States, it remains the case that most often only a limited set of key competences are subject to summative assessment – risking a narrowing of teaching and learning. However, examples of policies to broaden summative assessment do exist.

One country whose assessment processes, along with the national curriculum reforms, are centred explicitly around the key competences framework, is Spain. The structure of both curriculum and assessment in Spain is now focused directly on key competences, rather than on traditional school subjects. [33]

5.1.1 Example: General Diagnosis Evaluation (Evaluación General de Diagnóstico) (EGD), Spain

This assessment is carried out in primary and in compulsory secondary education.

It assesses a national sample of pupils in fourth year of primary school and second year of secondary school.

The purpose is to provide information at multiple levels: to the student on their level in specific Key Competences; to the teaching institution, in order to improve practice; and to provide accountability data for the education system. Data are collated to assess the competence level acquired by students and by the group, to evaluate the school and the Autonomous Community.

The content covered is focused on the eight Key Competences in the Spanish curriculum:

1. Linguistic communication competence.2.Mathematical competence. 3. Knowledge and interaction with the physical world. 4. Information treatment and digital competence. 5. Social and civic competence. 6. Cultural and artistic competence. 7. Learning to learn

[33] From Eurydice (2009) "National testing of pupils in Europe: Objectives, organisation and use of results," Brussels: Education, Audiovisual and Culture Executive Agency.

competence. 8. Autonomy and personal initiative.

Methods used include paper and pencil tests, essays, short answers and multiple choice, computer-based tests, performance tasks and authentic tasks.

The focus of the assessment is on knowledge, skills and attitudes. Key Competences are established in the Spanish curriculum by law, with the aim of supporting all students in integrating their learning, connecting it with different kinds of content and using it effectively in diverse situations. The assessment process supports learners in this as it assesses key competences on an on-going basis. The ultimate aim of the process is to promote learners' achievement of key competences at the end of their compulsory schooling. Assessment results are expressed as in the level established by the national curriculum.

In this example all of the key competences for lifelong learning are explicitly addressed by the national assessment regime. The introduction of key competences into the Spanish curriculum as a central organising framework made this possible. It also shows how, in order to be effective, curriculum reform has to be followed by assessment reform.

Another example from Belgium shows how a national level strategy for summative assessment can help learners to develop the key competences. This process supports many different purposes, including monitoring standards for system accountability. However, it also promotes a wide range of knowledge, skills and attitudes.

5.1.2 Example: Flanders' National Regional Assessment Programme

In Flanders, the National Regional Assessment Programme assesses a representative sample of pupils in the final year of primary education, and at the end of key stages in secondary school.

The content which these assessments probe include: individual school subjects encompassing general, vocational and artistic education; specific skills; cross-curricular competences which are defined in the school curriculum by means of cross-curricular objectives.

Four of the Key Competences are assessed through these processes on an on-going basis: Communication in the Mother Tongue, in Foreign Languages, Mathematical competence and Learning to Learn. It is planned that Digital Competence will be explicitly addressed in the future.

The methods of assessment used include:

- paper + pencil tests which can include written essay type examinations, short answer questions, multiple choice in writing;
- ICT supported tasks;
- practical real life tasks, which probe pupils' achievement of the given competence, eg using tasks such as scientific inquiry in the context of field work in the woods;
- pupils', teachers' and parents' perception of the subject gathered in the form of questionnaires.

These processes require the learners to: speak, listen, read, write, use numbers, work with a computer, technology or other equipment, carry out a task, work alone, evaluate and

answer questions about their work.

These methods are used to assess combination of knowledge, skills and attitudes but the weight given to each varies, depending on the situation.

The assessment process is designed mainly for the purpose of system monitoring by a research team in the university, in consultation with teachers. Work is marked and results are interpreted by the research team, again with input from practitioners who discuss the results at conferences convened for that purpose. The results are used

a) to provide reliable data on pupils' achievement of targets specified in the national curriculum;

b) to identify factors contributing to success or failure;

c) to improve practice and foster a learning culture in schools through the use of information;

d) to provide system-wide accountability data.

Information about pupils' results and performance is also used at school level and by individual teachers in order to improve practice.

This comprehensive process makes use of a wide variety of methods which can reveal - and encourage - different dimensions of key competences, and in particular key competences such as Learning to Learn, Social and Civic Competence, Communication in the Mother Tongues and ICT as part of the Digital Competence.

It also shows how important it is to involve all stakeholders the development of curriculum and assessment regimes: Flanders has established platforms in which teachers, researchers, learning material publishers and authorities meet regularly to discuss the outcomes of evaluations and the ways forward.

5.2 Maximising the positive potential of high-stakes assessments

Two important policy issues emerge when countries try to reconcile assessment processes developed for high stakes purposes - gathering accountability data or awarding qualifications - and also, for the purpose of supporting the development of key competences.

First, national tests which are designed for high stakes purposes often focus mainly on knowledge and skills. This may be at least partly due to the logistical difficulties of exploring process dimensions of competence in large scale assessments. These technical challenges tend to narrow the focus of teaching and learning to knowledge and to - some extent – skills. This may put pressure on teachers and learners to concentrate on the aspects of curriculum that are tested, rather than on developing key competences. This in turn can limit the extent to which learners develop the full set of key competences. Furthermore, this effect may have the worst impact may on learners who are already disadvantaged in the system.

Second, these unintended negative consequences of high-stakes assessments tend to be associated with particular methods. Standardised tests, especially multiple choice tests, are frequently criticised for narrowing the range of content and methods used, and have been found, for instance, to obstruct adult literacy learners in pursuing their own learning goals.[34] Some written examinations that focus on a narrow range of content have been found to have similar effects.[35] League tables, which give simplistic summaries of results, can have a particularly negative impact.[36]

However, there are examples of high-stakes assessments that, by clarifying the purpose of the assessment and broadening the range of methods used, can counteract some of the negative effects which certain assessment processes can have on learning, especially in narrowing the focus of attention on to the curriculum as tested.[37]

The following example from Austria shows that summative assessment for certification can support the development of key competences when it uses many different methods and has a clear purpose.

5.2.1 Example: Austria, Reifeprüfung.

The Matura/Reifeprüfung is the upper secondary school leaving examination in higher academic institutions and also, in secondary and vocational colleges.

The assessment process happens at the end of schooling. The aim is to provide students with a qualification. This is reported as a pass/fail and a grade. The qualification gives students entry to university or tertiary education.

Content assessed: school subjects, chosen by the student and the school, in accordance with national guidelines. In technical and vocational schools, work-related knowledge and skills. Cross-curricular skills are also addressed.

Methods used for assessment involve:

(a) a quasi-scientific, multi-disciplinary paper which learners write during the final year reporting a research project they have worked on;

(b) a written exam at the end of the last school year;

(c) an oral exam in front of a representative of the examinations commission after the

[34] Torrance, H. and Coultas, D. (2004) "Do summative assessment and testing have a positive or negative effect on post-16 learners' motivation for learning in the learning and skill sector?" quoted in Brooks, G., Heath, K., Pollard, A. (2005) "Research report: assessing adult literacy and numeracy – a review of assessment instruments," London: NRDC, page 17;

[35] ACCAC (2003) "The ACCAC report on the value of the key skills tests: the value of tests I n the assessment of key skills qualifications," reproduced in QCA/ACCAC/CCEA (December 2003) Review of the September 2000 Key Skills," London: QCA.

[36] Rowe, K., (2000) ACCAC (2003) "The ACCAC report on the value of the key skills tests: the value of tests I n the assessment of key skills qualifications," reproduced in QCA/ACCAC/CCEA (December 2003) Review of the September 2000 Key Skills," London: QCA.

[37] Wiliam, D. (2006) "Keeping learning on track: Formative assessment and the regulation of learning," Making Mathematics vital: proceedings of the twentieth biennial conference of the Australian Association of Mathematics Teachers.

written exam when they present and defend their project.

Activities: students have to speak, listen, read, write and use numbers. They have to work alone, and they also have to answer questions about their project.

This example from Austria illustrates a process which is explicitly designed to provide information about the learner's command of a wide range of competences. This includes the learner's ability to apply knowledge in a real-life context. This is probed through the on-going research project. It also shows the benefits of using several different methods to gather information about a comprehensive range of learners' achievements. These methods touch on several of the key competences. Communication in the Mother Tongue, Foreign Languages and Mathematical Competence are assessed formally in a) the final written project report, b) the written examination and also in the project and the oral examination. Other key competences, including Learning to Learn and Social and Civic competence, are shown in a) the research project and b) the oral examination.

Two other examples from Germany concern the final examination of the Realschule and aim at expanding the range competences assessed within a high-stakes summative assessment. They also specify to what extent these broader activities count towards the final mark, thus underlining that they are indeed valued as learning outcomes.

5.2.2 Examples: "EuroKom" and "Fächerübergreifende Kompetenzprüfung", Germany

In Germany, the Land Baden-Württemberg has introduced two new elements into the final examination for pupils in Year 10 in Realschulen, designed to expand the range of competences assessed as part of the final examination.

1. The **"**EuroKom" Europäische Kommunikationsfähigkeit (European communication ability) exam counts for around one half of the final grade in the obligatory foreign language. The 15-minute exam consists of three elements, and is taken by pupils either individually or in pairs:

a) a pre-prepared presentation, which has been discussed and agreed by the examining teacher in advance, and on which the student(s) then answer questions;

b) an oral comprehension exercise;

c) a role-play based on an authentic situation.

2. In addition to written examinations in the core subjects of German, mathematics and the obligatory foreign language, pupils must also take a **"**Fächerübergreifende Kompetenzprüfung**"** (cross-curricular competence examination).

Like the EuroKom, this examination consists of a pre-discussed and pre-prepared presentation, followed by questions from the examiners. However, in this case the examination is taken by students in groups of between 3 and 5, and must cover at least two curricular subjects. The examiners are teachers in these subjects, including an external moderator from a different school.

The examples from Austria and Germany also illustrate the close connection between teaching, learning and assessment. Including oral interviews, project work and discussion

and role play are as methods to assess learners' achievements in more authentic situations. However, in the normal teaching and learning day, these are also effective teaching methods, which can actually help learners to develop the key competences. Therefore, this part of the national assessment regime, which provides learners with national qualifications or leaving certificates, actually encourages the use of teaching methods which help to promote a competence-based approach in teaching and learning.

The examples also suggest that balancing the potential negative effects of high-stakes assessment is possible by broadening the range of methods used to gather evidence of performance. This is one way of maximising the positive impact of assessment on learning. Methodology that purposefully and systematically highlights those elements of learning which are necessary for the development of key competences can be a powerful tool to promote competence.

5.3 The use of ICT and other technologies in assessment

At the level of schools and individual learners computer–assisted testing has a long history in all Member States and many countries such as Scotland have created e-assessment resources for school and teachers to use.[38] A recent Eurydice study shows, however, that at national level testing some half of the countries do not use ICT-based systems; moreover, in most of them, when it is used, it is for handling data.[39] However, the potential of ICT has been recognised, and some countries strive for a more systematic use of ICT as "computer-adaptive testing" that flexibly adapts difficulty to correspond to students' responses and that gives more relevant and detailed feedback on their learning. Similarly, the use of e-portfolios, which help students to present their learning outcomes and to reflect and act upon them, is growing.

A recent research report concludes that ICT-based, or, 'e-assessment' can have the following benefits:[40] [41]

- it can have a positive effect on motivation and performance as it links learning and assessment in a way that empowers the learner;
- it is flexible and easy to use and can free up teacher's time;
- it can provide rich diagnostic information;
- it can draw on extensive and high-quality information resources and include skills that are not possible to address in traditional paper/pencil type tests.

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[38] http://www.rsc-sw-scotland.ac.uk/eAssessment/eAssessment.htm#advantages

[39] Eurydice: National Testing in Europe, 2009.

[40] Towards a Research Agenda on Computer-based Assessment. JRC Scientific Reports, 2008

[41] See also: The Assessment and Teaching of 21st Century Skills, a project of Cisco, Intel and Microsoft at **http://www.atc21s.org/home/**, - a project that started in 2009 to look at how ICT-based assessment can support the development of 21st Century skills

However, the same report concludes that ICT so far has been used mainly for transposing existing tests onto a ICT platform and that its potential for assessing wider skills and competences needs more attention and research. In relation to assessment of key competences, a promising development is is the evolution from using ICT for the administration or transposition of conventional tests towards "intelligent measurement" that can produce individual profiles, advice to learners and their teachers and simulate authentic situations.

Moreover, it is also important to note that informal online networks and communities have a great potential to support lifelong learning and personal development, which is just starting to be exploited in a widespread way (eg through initiatives such as eTwinning). These networks encourage peer learning and self-regulated autonomous learning that is even less integrated in formal learning: educational practices and culture (curricula, assessment) will need in future to take more account of the potential of networking and other solutions new technologies for the for the development of key competences.[42]

The above-described developments are illustrated in Denmark, where internet based material is being incorporated as part of the upper secondary exams. The aim is to provide similar conditions for students in exams as they have in learning in school and through homework, the major part of which is now done by using virtual material.

5.3.1 Example: The Use of ICT in Assessment in Denmark

In the final exams of upper-secondary and commercial school students have used since 2001 digitalised packages of information and data in cd-roms. This has enabled tasks that test student's ability to search, combine, analysed and synthesise information and work in an inter-disciplinary way.

A new pilot was launched in 2009: instead of cd-roms students use Internet which allows for the inclusion of even broader types of tasks in the exams. They can assess students' skills for searching and understanding information and creativity in applying that information in their answers. The Danish Experience shows that both teachers and students welcome the use of 'non-linear' material as opposed to the use of textbooks. The aim of the Danish authorities is to broaden the use of ICT-based material to cover all subjects over time.

Despite the fact that the next example – the Irish 'Fon' project - is small in scale (implemented by a network of 14 teachers and 420 young people in 6 schools in the North and the South of Ireland), it shows how local initiatives or pilots can develop innovative uses of new technologies in teaching, learning and assessment that would be worth exploring further and scaling up.

5.3.2 Example: The Fón Project in Ireland

This project promoted a way of learning the Irish language through the use of mobile phones and computer technology. It also developed an approach to assessing and

[42] European Commission, Joint Reseach Centre Policy Brief: Learning 2.0 – The role of Social Media on Learning in Europe. **http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=3099**

recording learners' progress.

Mobile phone were used by teachers of the Irish language to send vocabulary SMS to their pupils on a daily basis; and by students who dialled up a voice-response system where they left messages in answer to their teachers' questions. They could also voice-chat with other students according to a structured format designed with the teacher.

Networked computers facilitated on-line chat between students and teachers, again, conducted around a structured task or stimulus. Teachers could listen back to learners' conversations, assess progress and provide feedback. Students also had an online interface where they could store their recorded responses and the teacher feedback.

All of this technology can be used both to teach and assess the language competence. It can also be used for the purpose of on-going and even for summative assessments. Some of the young people had the idea of generating and recording evidence of their progress and achievements on You-Tube.

The various activities and uses of technology demonstrated in this small project also reveal, and promote, many aspects of the key competences: languages, competence in communication and learning to learn and digital competence. Another advantage which this project illustrates concerns the role of learners themselves in creating responses to the challenges of assessment.

5.4 How can national polices promote the use of formative assessment in schools

The 2009 Joint report and a Eurydice study[43] show that many countries feed the results of summative testing back into the teaching and learning process. For example, the Cypriot Functional Literacy Project tests all pupils at the end of primary schools for systemic monitoring purposes; however, it also acts as a diagnostic tool to identity children who are likely to need extra support in reading and mathematics.

But many countries moving towards a national policy which supports more systematically the use of formative assessment in schools and helps teachers and school managers to use the techniques. These include the development of handbooks, guidelines and teaching materials, and professional development programmes that equip teachers to use formative assessment in their daily teaching practice.

The "Assessment for Learning" (AfL) project refers to an 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[44].

[43] National Testing of Pupils in Europe: Objectives, Organisation and Use of Results. European Commission 2009.

[44] Assessment Reform Group (2002) "Assessment for Learning: 10 Principles: Research-based principles to guide classroom practice,"

The table below summarises the Assessment for Learning project in England.

5.4.1 Example: Assessment for Learning in England

Assessment for Learning (AfL) in England is a major teaching and learning strategy which is embedded in the work of all primary and secondary schools. It builds on previous strategies such as Assessing Pupils' Progress (APP) for criteria against which learners' progress can be judged and materials which support teachers' work.

Assessment for learning is defined as "the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there."[45] It is based on the principle that pupils will improve most if they understand the aim of their learning, where they are in relation to this aim and how they can achieve the aim (or close the gap in their knowledge).

AfL identifies and supports a range of practices that should be part of everyday learning and teaching, including:

- sharing and talking about learning objectives, learning outcomes and success criteria with children; clarifying progression;
- observing and listening to gather intelligence;
- questioning and whole-class dialogue to check, probe and develop understanding;
- explaining and modeling to clarify progression in key concepts and skills, demonstrate thinking processes and exemplify quality;
- giving oral and written feedback to support the evaluation of progress, clarify standards and help identify next steps in learning;
- planning for group talk, peer assessment and self-assessment to help children develop as independent learners;
- planning specific activities that give teachers an insight into the progress children are making, the standard they have achieved and the obstacles to their progress.

AfL supports a whole school approach to assessment that encompasses teaching and learning strategies, staff development, management support, materials and self-evaluation tools which assist schools in monitoring and enhancing their assessment policy and practice.

AfL is a way of working that takes place in three ways:

Day-to-day
• Learning objectives are made explicit and shared with pupils
• Peer and self-assessment are in use
• Pupils are engaged in their learning and given immediate feedback
Periodic
• Broader view of progress is gained across subject for teacher and learner
• National standards are used in the classroom as reference points
• Feedback supports improvements in medium-term curriculum planning

[45] Assessment Reform Group,2002

Transitional
• Formal recognition of pupils' achievement
• Progress is reported to parents/carers and next teacher(s)
• External tests or tasks are used to confirm judgements.

Government funding of £150 million has been allocated for 2008-11 for continuing professional development for teachers in assessment for learning. An Assessment Policy tool has been provided for schools to reflect on their own practice, and to produce a school-wide action plan across different subject disciplines. A Professional Framework of Assessment is available for schools and teachers that highlight the skills and competences needed for effective assessment. The strategy also provides schools with consultants and expertise from other schools.

The medium-term goal is to have a trained assessment specialist in every school to run in-school moderation, induct new staff and develop assessment policy for the school.

The Assessment for Learning Strategy progresses step-by-step: it focuses currently mainly on assessment for learning at ages 10-14, taking in English and mathematics as a starting point for subject specific support and guidance. It will be later extended to other areas.

Many of the individual elements comprising Assessment for Learning are typical of good teaching and assessment practice. What distinguishes AfL is that it deliberately sets out to identify and implement all of the features needed to support learning in a particular situation, at all levels.

A similar project in Scotland illustrates the many different levels at which formative assessment can support teaching and learning:

5.4.2 Example: Assessment is for Learning (AiFL), Scotland

In Scotland the Assessment is for Learning (AifL) initiative supports the major innovations taking place under the Curriculum for Excellence reforms. It expands the formative assessment concept in terms of a three-way relationship between the curriculum, learning and teaching, and assessment.

- *Assessment of learning* is about gathering and interpreting the evidence. It connects the curriculum and assessment.
- *Assessment for learning* is about supporting classroom learning and teaching. It connects assessment and learning/teaching.
- *Assessment as learning* is about learning how to learn. It connects learning/teaching and the curriculum.

AIFL takes a whole-school approach to assessment, mobilising the support of teachers, parents, managers and pupils and engaging in assessment for learning at every level in the system. Teachers are supported through dedicated training and on-line resources including a self-assessment toolkit, case studies on target-setting, tracking and recording progress, and support for teacher networking and mechanisms for the sharing of good practice and for facilitation teachers' access to relevant research.

Practitioners are supported by an extensive programme of staff training, guidelines,

rubrics and resource materials and a web-site with access to on-line tool-kits and materials.

These two examples from England and Scotland illustrate how comprehensive national policies can support the quality of teaching and learning in schools through the development of assessment approaches. They also illustrate the range of practical support which teachers and learners need, to make these policies a reality.

The examples show how teaching, learning and assessment are intertwined; and how reforms of curricula need to be accompanied by assessment reforms and extensive programmes to involve teachers and trainers widely in the design and implementation of the reform process.

These examples also illustrate that policy supporting formative assessment can contribute to the overall shift from transmitting knowledge towards competence-based, holistic teaching and learning as it they emphasise the process of learning as much as the content of it; the key role of the learner in managing his/her own learning and the overall goal of learning to apply knowledge in real-life situations.

5.5 Assessing key competences at school level: using formative assessment

Two factors seem to be key for the effective use of formative assessment in schools and training institutions: the overall assessment culture and the ethos of the school; and teachers' competences to integrate the principles of formative assessment in their daily work and the tools available to them to enable them to do so.

First, schools which use the potential of assessment fully generally have a comprehensive approach to assessment and evaluation, which is often part of an overall school development strategy. Elements covered by this approach include specifying the ways performance information will be gathered in order to improve teaching and learning (school level feedback), the ways individual student's progress is supported. This is important also because the systematic use of formative assessment requires a whole school commitment and collaboration – not only between teachers and students, but also with parents and other teachers. It requires an interdisciplinary approach that combines several subject areas and includes working methods that promote creativity and problem solving. It is thus likely that a school where formative assessment is effectively used can be characterised as a learning community in which:

- values and vision are shared by teachers, students, parents, and other stakeholders and characterised by positive expectations that influence both teachers' and students' motivation to focus on learning and improving learning;

- teachers collaborate to enhance curriculum, teaching and assessment strategies for learning and feel they can make informed and responsible decisions about innovative teaching and assessment strategies;

- expertise and professionalism are valued and work builds on openness, dialogue, inquiry and experiments.

Second, it is vital that such an approach to assessment gives teachers a clear idea of how they can reconcile their summative and formative roles:[46] how the requirements of summative assessment and the systematic use of formative assessment can be aligned in daily work. Teachers' assessment 'toolbox' includes:

- **Self-assessment** that engages learners in active and critical reflection on their own work. It can take the form of one-to-one or group discussion, marking own work, completing specially-designed questionnaires and is often supported by ICT. It is usually carried out in conjunction with the teacher or trainer.
    - *For example, Irish students taking part in the pilot Key Skills project regularly assess their own work and that of their peers. Specially tailored check-lists known as 'reflection' forms are used as a focus for reflection, and also allow learners to record their impressions. These can then be revised at a later date and provide an aide-memoire, and qualitative evidence, of progress.*

- **Peer assessment** in which the focus is on learners' providing a critique of the work of their peers.

- **Performance Tasks** are activities which may occur naturally in a learning situation, or may be specially structured to allow the learner to demonstrate competence in particular areas. Such tasks are closely-aligned with methods and activities carried out on a day-to-day basis but when used for assessment purposes, are observed and monitored in a structured way by the teacher or trainer.
    - *In the Irish "Fón project" example presented earlier, teachers and learners together designed activities which allowed the learner to practise and to demonstrate their progress in the Irish language. Young people used their mobile phones for many different tasks which allowed them to engage with teachers, get feedback, do homework and provide evidence of learning.*

- **Portfolio Building:** an approach to teaching which can also be used for assessment. Learners gather samples of work over a period of time which provide evidence of their progress and achievements in specified aspects of competence. A process of reflection is needed to support learners in deciding which pieces of work demonstrate which competences.
    - *For instance, teachers and learners in Londýnská school in Prague use the process of portfolio-building as a way of teaching educational content, and also of promoting pupils' capacity to make judgements about their own work, reflect on their learning and negotiate a point of view with their teacher.*

[46] See e.g. Black and Wiliam, Inside the Black Box

- **Project work**, especially interdisciplinary projects which cross subject boundaries and connect school with life outside the school, are used for learning and assessment purposes.
    - *In Austria, for example, multi-disciplinary projects are an essential requirement for the award of the senior vocational and technical Diploma. Students identify a topic and design the method in collaboration with their teacher. The project is often centred on a topic which relates to an out-of-school issue and sometimes is carried out in collaboration with a local enterprise or employer.*

- **Recording tools** used to capture learners' progress and achievements can be tailored to match performance tasks, peer- or self-assessment.
- **A Personal Learning Plan** is a process of communication between learner, teacher and sometimes parents, the outcomes of which are recorded in a specific plan. This is specially designed to record the main aims which the learner hopes to achieve, and the targets, methods and indicators by which they will be accomplished. The document itself (sometimes called Individual Learner Plan, Personal Education Plan, or other) is only a record of the deeper process of reflection and communication with the learner.

The examples above show how assessment can woven into the teaching and learning process; teachers use a variety of methods for organising learning in order to intentionally and systematically promote and develop individuals' learning. The advantage of using various forms of assessment is that they value a broad range of key competences, including communicative, social and reflective skills, and that they build on strong inputs by the learner him/herself.

6 CONCLUSIONS AND REFLECTIONS FOR FURTHER WORK

Key competences have a prominent place in European curricula and lifelong learning strategies. Including key competences in curricula is, however, only the first step - and probably the easiest. The implementation of a key competences approach requires many other policy areas to be addressed: the development of teachers' competences, learning material and indeed assessment policies and practise.

For individual learners assessment shows what is valued as a learning outcome and thus worth achieving. But the impact of assessment in teaching and learning is also well documented: the scope and methodology of assessment has direct impact on what and how teachers teach and students learn.

Key competences are a complex construct to assess: they combine knowledge, skill and attitudes and are underpinned by creativity, problem solving, risk assessment and decision-taking. These dimensions are difficult to capture and yet it is crucial that they are all learned equally. Moreover, in order to respond effectively to the challenges of the modern world, people almost need to deploy key competences in combination.

There are already good examples in Member States on how to assesses creativity and other crucial skills such as problem solving. Capturing the attitudinal dimension of key competences is possible by broadening summative assessment, and, in particular, through systematic and intentional use of formative assessment. These innovative examples hold much promise for the future and would be worth further exploration within and between Member States, and scaling up.

Similarly, as the European Framework describes the eight key competences as 'finishing points' (i.e. what young people should have developed by the end of their initial education and training), further work is needed to translate key competences into more tangible levels, stages or other learning outcomes for teachers and students to use. Existing international indicators and European tools such as the CERFL and EQF already define levels for some elements of key competences. Nevertheless, it seems most feasible to pursue this work at national level, or at the level of schools or training institutions. This work is crucial as teachers need levels, scales or other descriptions of expected learning outcomes in order to plan activities and translate curricula in practical work. For students, they give important 'signposts' for their learning paths.

There is a growing understanding of the power of formative assessment for improving learning. The policy examples presented in this paper however suggest that a comprehensive support is needed that encompasses not only curriculum development and assessment guidelines, but that recognises the changing roles of teachers, their competences and the role of the overall ethos of schools in supporting learning. To what extent schools' self-evaluations can support this, would be an interesting question to explore.

While summative testing for qualifications and accountability purposes have been criticised for narrowing the curriculum and its teaching, and thus hindering the development of key competences, many contrary examples do also exist. Broadening the ways evidence is gathered, making students responsible for demonstrating their own competences and enabling them to do so, for example, help creating summative assessments that promote the development of a broader range of key competences. Good

practice exists that could be further development and disseminated through mutual learning.

The potential of ICT has not yet fully used to answer to the issues arising from the assessment of key competences. While ICT has been exploited mostly in administering testing and for allowing for the use of larger databases and information, it would be useful to map out the use of ICT applications in simulating authentic situations in which a broad range of key competences would be assessed. Computers can create 'micro worlds' for students to explore in order to discover hidden rules, patterns, etc that reveal their understanding of phenomena and skills to solve problems. Similarly, the potential of e-portfolios in summarising learning outcomes and thus influencing the quality of learning would be worth exploring further.