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Consortium of Institutions for Development
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A toolkit for the European citizen

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The implementation of Key Competences. Challenges and opportunities.

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Foreword

I am delighted to present the 2008 yearbook of CIDREE to the members, to our colleagues across Europe, and to the global audience of those interested in education and its future.

Every so often, in education as in most other disciplines, an idea shakes our thinking and moves us into a new space, towards new ideas and new possibilities. How can we tell when such a paradigm shift is occurring? One piece of evidence comes from geography. When we look at the range of papers presented here, and the countries and represented by the authors, it is clear that competence is a concept that is generating reflection, debate – and action - across borders and between nations.

Another piece of evidence comes from history. A look back at old debates about core curricula, about school subjects, and about the canon of content shows how far we have moved in a relatively short time. Such old debates have not gone away, but new lines of argument have been added. What to teach remains a fundamental curriculum question; but added to it we now ask how to learn? And that question is not just bound by the walls of the school room, it is now a lifelong and life-wide pursuit – how to keep learning?

What we are experiencing is a paradigm shift brought about by the emergence of the knowledge society as a defining force in European society. The high speed movement of information, ideas, markets, and people makes new demands on citizens of Europe, and has, through the Lisbon process, generated a Europe-wide response. It is an exciting time to work in education and to think about the new possibilities offered and challenges posed by the knowledge society. The papers presented here discuss both the possibilities and the challenges. While the paper on the European framework for key comptences reminds us all that there is more work to be done, read together, the papers offer an optimistic view of schooling, and of 21 st century curriculum being re-shaped by the efforts of the CIDREE members, in their own countries and together as a consortium.

On behalf of all of the CIDREE members, I want to thank the contributors for their work. I want to express particular thanks to Chris Van Woensel for her editorial work on this yearbook. In delivering the collection she and her colleagues demonstrated all of the key competences, to the highest level! CIDREE is most grateful.

Anne Looney
President CIDREE

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Introduction

— *Chris Van Woensel*

"That education should be regulated by law and should be an affair of state is not to be denied, but what should be the character of this public education, and how young persons should be educated, are questions which remain to be considered. As things are, there is disagreement about the subjects. For mankind are by no means agreed about the things to be taught, whether we look to virtue or best life. Neither is clear whether education is more concerned with intellectual or with moral virtue. The existing practice is perplexing; no one knows on what principle we should proceed – should the useful in life, or should virtue, or should the higher knowledge, be the aim of our training; all three opinions have been entertained. Again about the means there is no agreement; for different persons starting with different ideas about the nature of virtue, naturally disagree about the practice of it."

(*Aristotle, Politeia, Book 8*)

What should children learn? Who defines it?

In the 4th century BC, Aristotle formulates the same questions as we do in the 21st century. What should children learn at school? He states that no one agrees about the things to be taught and that there is a lot of discussion concerning the goal of education itself. Defining a core curriculum on a national level, things are not different nowadays. *"In reality, the force field which determines the content of the school curriculum comes down to a constant interaction between a number of parties concerned, who all compete to gain control of the curriculum. A number of parties concerned can be clearly identified: parents (or certain categories of parents), pupils, parliament, the government, industry, teachers, and the science of education, religion and philosophers, influential organisations in society and the local community."* (Standaert, 2001 p.16).

Education is one of the institutions that belong to the basic structure of a well-organised democratic society and thus the content of the (core) curriculum is defined according the procedures in use in this society. Furthermore, talents such as intelligence are no fixed property with a constant capacity, but potentialities to be developed. *"They are merely potential and cannot come to fruition apart from social conditions; and when realized they can take but one or a few of many possible forms. Educated and trained abilities are always a selection, and a small selection at that, from a wide range of possibilities that might have been fulfilled."* (Rawls, 2003, p.57).

Education has the important responsibility to detect and to develop a large range of abilities in children with different capacities. All children have to profit, for equal opportunities are an important issue in society. Still, international (PISA) as well as Flemish research (Verhaeghe, 2002, p. 26) indicate that for example scores on reading tests strongly relate to the social environment of the children and the educational level of the parents. Indeed,

children enter school with a different "cultural capital" speaking in terms of Bourdieu and Passeron (Bourdieu, 1970, p. 296). The extent to which a child's knowledge, skills experience or connections relate to or match with the dominant culture of a society depends on his or her social environment. Eventually education can make the difference. Thus, knowledge and skills developed by means of education may not be dependent on the social level one is born in. *"The state's concern with education lies in their (sc. of the children) role as future citizens and so in such essential things as their acquiring the capacity to understand the public culture and to participate in its institutions, in their being economically independent and self-supporting members of society over a complete life...."* (Rawls, 2003, p.157).

In trying to define and to select competences people should have as an essential condition to function in society and to develop a personal life, many lists appear. For example, Martha Nussbaum[1] established a list of 'basic capabilities', which every human being worldwide should be able to acquire and use, if and when they receive the necessary educational and material support (Nussbaum, 2000, p. 77 – 81). It is a known and heavily discussed list formulated from a theoretical - philosophical point of view and based on the developmental potential of an individual.

The list is a mixture of material and social circumstances. Both training internal capabilities and letting them express themselves once trained are important. For example, 'Bodily health' is among other things described as being able to have good health. The development of this capacity not only requires action from the state to provide the necessary suitable external conditions. The individual must also be able to acquire the necessary competence for staying in good health, that is to say e.g., eat healthy meals, and say no to drugs and so on.

The capability 'Affiliation' is defined as follows: *"Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction"* and will be found in a lot of educational programs or curricula as social skills and communication skills, including the use of mother tongue and foreign languages. In the 21st century, also digital competence will be of importance to communicate.

The capability named 'Senses, Imagination and Thought' entails, as Nussbaum writes, *"being able to use the senses, to imagine, think and reason – and do these things in a "truly human" way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experience and producing self-expressive works and events of one's own choice, religious, literary, musical and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to search for the ultimate meaning of life in one's own way. Being able to have pleasurable experiences, and to avoid non-necessary pain."*

Though these capabilities are formulated from a philosopher's point of view, the link with educational goals is evident. These types of capabilities were heavily criticised for being based on typically Western values. Curriculum content is also value-based. All actors in-

[1] Martha C. Nussbaum is Ernst Freund Distinguished Service Professor of Law and Ethics Department of Philosophy, Law School, and Divinity School at the University of Chicago

volved have a specific point of view and specific wishes for the content and goals of a national defined (core) curriculum.

European competences

Maybe closer to economic and political life then the latter, an OECD project named 'Definition and Selection of Competences', resulted in a listing of very important capabilities, or as they are called, key competences. According to the results of the project,[2] the competences we need for a successful life and well-functioning society are the following:

- Using tools interactively, tools such as language, symbols, technology and information sources
- Interacting in heterogeneous groups which means among others dealing with diversity, working in teams and manage conflicts
- Acting autonomously meaning to realise one's identity, to set goals, to exercise rights and to take responsibility and so on.

In fact, to educational authorities the most important question is not how many lists of more or less important competences exist. In educational matters, one needs a consensus or societal agreement about the competences, which the objectives of a national curriculum develop during the schooling years of children and young adults. In order to arrive at a synthesis of possible lists of capabilities or competences in which the essential knowledge, skills and attitudes are defined, and translating them into educational goals, a broad social debate is necessary (Standaert, 2001, p.17). This debate as well as its outcome is, as already stated, value-based.

Reaching a consensus is not getting easier because a supra-national level is developing, the European Union. The Recommendation of the European Parliament and the Council of 18 December 2006 on key competences for lifelong learning also entails a list. Eight key competences European citizens should acquire are defined together with the related essential knowledge, skills and attitudes. A brochure (2008) and the Recommendation, available in the languages of the members states, is at hand on http://ec.europa.eu/dgs/education_culture/publ/pdf/ll-learning/keycomp_en.pdf. This Framework represents the European political consensus about what a student at the end of compulsory education should be able to know and do. Each of these key competences can be easily linked to the three OECD key competences.

An attempt to organise the necessary debate on European level is made by means of the Internet. The European Commission launched a wide public consultation entitled "Schools for the 21st Century". The consultation was available in all official languages and was open to stakeholders and the general public, including teachers', parents' and pupils' associations from 12th July until 15 October 2007. An analysis of the results can be found on http://ec.europa.eu/education/school21/sec2177_en.pdf.

There is no need here for an extensive outline of development of the European Reference Framework 'key competences for lifelong Learning'. In the CIDREE yearbook 2003,

[2] The Definition and Selection of key competences. Executive Summary (2005) on website www.deseco.admin.ch

Becoming the best. Educational ambitions for Europe, the European educational policy is the central theme. The publication gives information and views on the European ambitions, principles, instruments and strategies and an insight in the previous history. Just as a reminder, it is opportune to mention the Lisbon European Council in March 2000 concluding that a European framework should define the new basic skills to be provided through lifelong learning. This was the starting point for establishing a European workgroup 'New basic skills'.
The Framework developed by the working group meets educational systems functioning within a context that is strongly determined by the history and culture of a region or nation. On the other hand, the European Union as an economic and political entity is from a historical point of view rather recent. Finding out what happens next in the different member states concerning the European Framework is interesting since the key competences as defined within the Framework arrive in different national contexts. Seeking the right balance between the European values and Framework and the national values and frameworks is one of the challenges for implementing key competences.

Implementing key competences

One of the important factors, which affect the degree of implementation of the European key competences, is the steering mechanisms available to the national education authorities. Furthermore, there is the structural element in education: the more an education structure differentiates (2001, Standaert, p.28), it will give cause for less general and common basic education, the place to be for key competences. In addition, lesson tables or timetables have a certain impact on the content that is taught. Then there is the more or less detailed national curriculum. The large majority of the countries also have a system of central assessment, which strongly determines the contents in education (teaching to the test, Standaert, 2001, p.29).
Further, research literature indicates that schoolbooks strongly influence the content of the school curriculum. In a joint seminar of the Cluster 'Teachers and Trainers' and the Cluster key competences – Curriculum development (3-4 April 2008) the teachers' overreliance on learning material produced by others was discussed. Furthermore was stated that the *"successful implementation of transversal key competences requires a systematic approach: they should have a clear status in curricula, and teachers' initial and in-service training, and pupil assessment and learning material should reflect the new approach."*[3]
All mentioned elements - status of key competences in the curricula, in teachers training, in pupils' assessment, in learning material – are to be kept in mind, reading the contributions to this yearbook. There are some additional issues: how much pressure is there for schools and teachers – and pupils! – to work on key competences? How much and what kind of support is available?

[3] http://ec.europa.eu/education/policies/2010/doc/teacherreport_en.pdf: p.2

CIDREE

As a network of curriculum institutes, strongly engaged in what matters for Europe, CIDREE has decided to reflect on the key competences voted by the European Parliament. The member institutes deliver their visions on the expectations and realizations regarding the European competences. The contributions from the different member institutes and their educational systems must open the way for further work and initiatives concerning the key competences.
Thus, the general question here and now is how to deal with key competences within the educational system and curriculum development in compulsory education. Which is the role of the European Framework in developing and revising curricula on national level? A short overview brings clarity about what the reader of this CIDREE yearbook could expect.

I The European framework: state of affairs

European Union

The first contribution in this publication, *Key competences for lifelong learning – A European Framework* written by Tapio Säävälä, describes the state of affairs in 2008 concerning the Framework and presents in annex the framework.

II Getting started: discussions and choices

Sweden

One of the first problems to tackle in each country is the tuning of the concepts and terminology in use with the conceptual background and terminology of the European Framework. In Sweden, the curriculum is under revision. The contribution from Ulla Linqvist, *In the middle of a process. Key competences in a Swedish context*, pictures the first phase of implementation of European key competences. The National Agency for education preparing for a major reform of the curriculum considers the position of key competences in the curriculum (cross-curricular or not?), the best way to formulate them (should fact-knowledge be extrapolated or not?), and the important matter of assessment. Some topics from the internal discussions are meaning and intentions with the recommended key competencies, needs expressed by Swedish working life, trade and industry, and research, relationship knowledge – competences, relationship key competencies – competences related to specific subject-areas and specific professions. A new model for assessment and grading is generally presented together with one concrete application namely art education.
The European Framework formulated for the end of compulsory education has to be made more concrete in function of the developmental phase of the pupils in the different grades and progression must be outlined through the years they are at school.

Ireland

Anna Walsh describes the reform of Senior Cycle (15 – 18 year age group) in Ireland and an approach to embedding key skills in the curriculum. After a consultation of students, parents, teachers, school management, educational and social bodies, looking into research and studying a lot of existing frameworks, an elaborated Irish framework of five key skills was developed: information processing, communicating, being personally effective, critical and creative thinking, working with others. The same discussions as in Sweden took place and choices had to be made. The answers of Ireland are formulated in the contribution. The Key Skills Project, an action research programme, provided findings to inform the design of the next phase. Due to this kind of research the voice of the practitioner, that is to say the teacher, is present.
Meeting traditions and culture of Ireland, the European Framework had a rather limited influence since it is one of the thirty-five studied frameworks. The conceptual and terminological discussion ended up by keeping the term 'skills' in use. Nevertheless, this contribution gives a nice example of an excellent prepared and well-founded innovation on national level.

III Searching for key competences

Austria

Key competences as defined at European level are not entirely new. A considerable amount of knowledge, skills and attitudes related to the key competences is already implicitly present in the educational goals and school curricula of many member states. The European Framework is in certain cases the occasion for taking the next step and explicitly search for the contribution a subject can make to the development of (some) key competences.
The contribution of Erich Svecnik, *The Integration of Transversal Competences in Classroom Instruction at Secondary Level I* puts the focus on the schools on lower secondary education. Based on the trias of competences (subject matter, self and social competence) a comparison between the EU reference framework and Austrian curricula and other legal texts is drawn. Some recent strategies for the implementation and assurance of key competences (esp. the definition of standards and standards-based tests) are presented and discussed based on a case study regarding the integration of transversal competences in mathematics.

Belgium (Flanders)

Another case study is provided by the contribution of Flanders (Belgium). Here we can read how a bottom up evolution meets the top down recommendations. Karl Desloovere, *Hurdles to be taken in developing digital abilities in Flanders* discribes how final objectives Information and Communication Technologies (ICT) for pupils in primary education (7 – 12 years of age) and in secondary education first grade (12 – 14 years of age) came into existence.

He gives the rationale for each objective and discusses the interfering powers on the implementation of the objectives one of the issues being the gap between the way digital media are used by young people and the goals of educational authorities, teachers and parents.

IV Key competences and the implementation ladder

France

A group of French authors involved in pedagogical research, Maryline Coquidé, Hélène Godinet, Alain Pastor and Jean-Marie Pincemin, report in *The Common Base for Knowledge and Skills in France* for debates over the concept of "competence" in their country. After a short presentation of the French educational system - as far as compulsory education is concerned - they submit a synthesis of the non-disciplinary key competences referred to in the French Common Base of competences and knowledge (2005). A comparative and differential analysis with the European key competences underlines what is recommended developed and what is not retained or occulted. They present and question the methods of implementation, the assessment devices and selected certification devices.
In the French legal texts, the European key competences are partially adopted from the European Framework, partially adapted and eventually differently ordered but explicitly present. The law is an important steering mechanism in education for getting things done, but is not sufficient for changing what happens in a classroom.

Spain

Enrique Roca and Rosario Sanchez Nunez-Arenas, give in *Citizens' competences and education for the 21ste century* the state of affairs in Spain. They provide a short summary of the inclusion of key competencies in the Organic Education Law (LOE) in Spain. They also include in their contribution the definition and further details of the key competences in the LOE: description and organization of each competence, its connection with each area and each subject of the curriculum to see how all of them contribute to the acquisition of the different key competences. In addition, a concrete assessment system for key competences is presented.

Czech Republic

An illustration of another implementation phase can be found in the contribution *"From the National Curriculum to Teaching Practice: 'Unpacking' of key competences."* made by Anna Valouchová and Jaroslav Faltýn. The text describes the new curricular system that started to be implemented two years ago, and which is very much competence-based. A two level curriculum system is implemented. A national curriculum outlines the basic expectations on what should be taught, but the final outline of what is taught and mainly how this is done is described in school curricula by each school. The text then focuses on how the teachers should detail the work with key competencies in their school curricula

and teaching. One more detailed example is given: unpacking Learning competences. Future challenges of the newly set up system are briefly mentioned at the end.

Hungary

The following contribution originates from Hungary and is written by Katalin Falus, Màrta Hunya and Attila Varga: *"Implementing key competences"* In Hungary a revision of the National Core Curriculum is completed in 2007. The main aim of the revision was to help the adaptation of the EU key competence framework. Nine competences based on the EU framework (maths is a separate competence in this system) are defined. On national level the revision of National Core Curriculum is a part of a wider content regulation system, which integrates the expectations and evaluation principles of the competence-based two-level school-leaving exam system, the accreditation criteria of curricula (frame curricula), and the content of the national competence assessment projects as well as- the development of learning materials. The article presents the efforts made in Hungary in the field of developing social competence and digital competence in detail. The revision is an example of a system-wide approach in curriculum innovation. Legislation, exam – and assessment system, teacher training, educational programme packings are considered.

V Available support: the role of educational research.

Slovenia

Next to the conceptual and terminological challenges, researchers and curriculum developers look into the subject related content and into ways of teaching in search for the contribution, a subject has to offer concerning transversal competences. Ljudmila Ivsek from Slovenia reports in *Key competences* about insights concerning the language of instruction. Though being the official language of the country, language still can be problematic and not only for migrant children since the language used at school does not always match with common speech. Therefore, every teacher should pay attention to the language used in instruction and subject-related concepts. Stimulating the language competence of pupils is in fact a cross-curricular goal. Furthermore, the language competence of an individual is a key for acquiring knowledge, for maintaining and building it up, for efficient inclusion in society and for fulfilling the needs in the work environment and private life. But then, how to deal with this issue?

Greece

Christos Doukas en George Palios from The Pedagogical Institute in Greece on the other hand are trying to pin down the contribution science (physics) can make to the development of the key competences 'learning to learn' and 'digital literacy'. They give in fact some more detailed information about syllabi, timetables and educational materials for physics in lower secondary education and examine how the key competences of learning to learn and digital literacy are introduced in official documents for syllabi (themes,

activities, evaluation). This includes the general aims of physics where the competences are mentioned and described, the learning methods and materials proposed for teaching and the objectives set for each grade. They also report on the obstacles faced by teachers and trainers due to the interdisciplinary nature of the curriculum and the introduction of Information and Communication Technologies (ICT) and propose strategies and actions.

VI Key competences: the foundation stone for vocational training

The Netherlands

Gerd van den Brink highlights in *Key competences in Vocational Education & Training* a new nationwide Qualification Structure for vocational education (intermediate level) completed in the spring of 2008 in the Netherlands. In his contribution, he describes and illustrates the format that underlies each Qualification Dossier. Part of the format is a general and 'universal' Competency Model of the Centres of Expertise on Vocational Education, Training and the Labour Market. Some examples of these competences are 'showing entrepreneurial skills and acting commercially', 'convincing and influencing' and 'following instructions and procedures'. These competences are linked to specific professional core or Key Tasks and Task-related specific work processes.

References

www.constitution.org/ari/polit_08.htm (downloaded 2 February 2006)

Bourdieu, P., & Passeron, J.C., (1970), *La réproduction. Eléments pour une theorie du système d'enseignement,* Paris, Editions de Minuit, 281 pp.

Conference proceedings, Brussels, 11 – 12 October 2001, *Cross-Curricular themes,* organised during the Belgian presidency of the European Union, 224 pp.

Nussbaum, Martha C., (2000), *Women and human development. The capabilities approach.* Cambridge University Press, 312 pp.

Rawls, John (2003), *Justice as Fairness. A restatement.* Ed. by Erin Kelly, London, Harvard University Press, 214 pp.

Robeyns, Ingrid, (2006) Three models of education: rights, capabilities and human capital. In: *Theory and Research in Education,* Vol.4, Issue 1, pp. 69 – 84, Sage Publications.

Standaert, Roger (2001) *Inspectorates of Education in Europe. A critical analysis,* Leuven, Acco, 122 pp.

DVO Werkgroep Evaluatie, (2005), *Equilibrium, Evenwicht tussen interne en externe evaluatie op de Europese scène (Balance between internal and external evaluation on the European scene),* 180 pp. available (in Dutch) on the website www.ond.vlaanderen.be/dvo/publicaties/equilibrium/equilibrium.htm

Verhaeghe, Jean-Pierre (2002) *Externe evaluatie van het Gentse SIF-brugfigurenproject.* Syntheseverslag januari 2002, Universiteit Gent, Vakgroep Onderwijskunde, 51 pp.

The Eureopean Framework: state of affairs

Key competences for Lifelong Learning - A European Framework

— Tapio Säävälä

Background and rationale

Lifelong learning has become an essential part of the EU's response to challenges that derive from globalisation, increased competition and the need for sustainable development and social cohesion. Since the Lisbon process was launched in March 2000, the European Council have stressed the importance of national strategies for lifelong learning that are consistent and comprehensive, and that will enable people to learn, maintain and update their competences throughout their lives. In the rapidly changing world of work of the 21st Century it is the ability to learn and update competences that helps people master their careers and seize the opportunities available for them. Learning is also vital for active participation in democracy and for personal fulfilment.

The November 2007 Education Council, for instance, stressed the importance of education and training in promoting adaptability, employability, active citizenship and personal and professional fulfilment. The Council sees the role of initial and continuing education and training as being essential for "equipping people with skills and competences of the highest quality, even excellence, in order to maintain and strengthen the capacity for innovation and utilisation of research". The 2008 Spring European Council called for investment more in people and urged Member States to take concrete action to substantially reduce the number of young people who cannot read properly and the number of early school leavers, and to improve the achievement levels of learners with a migrant background or from disadvantaged groups.

These political messages are founded on the belief that the knowledge, skills and aptitudes of Europeans can guarantee both the economic needs of Europe and the need for better social cohesion. Workforce skills and competences are the major factor in EU innovation, productivity and competitiveness. Growing internationalisation, the rapid pace of change and the continuous roll-out of new technologies mean that Europeans must not only keep their specific job-related skills up-to-date, but also possess the generic, transversal competences that will enable them to adapt to change. People's competences also contribute to their motivation and job satisfaction in the workplace, thereby influencing the quality of their work.

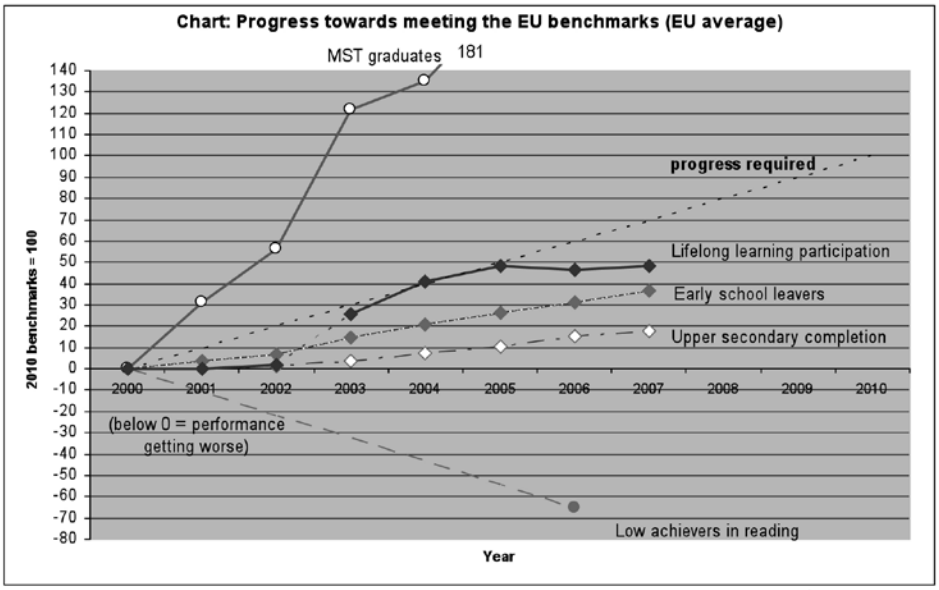
Innovation and creativity are seen as essential to Europe's economy and social model. In recent years, the way they are conceived has broadened: the production of knowledge and innovation is no longer in the hands of the few, but a collaborative process of creation, utilisation and evaluation of knowledge undertaken by many. For this reason, traditional hierarchies are being increasingly replaced by teams and collaborative work in which

each member is able to see 'the big picture' and has the motivation and skills to contribute to the joint venture. This, obviously, calls for solid communicative and interpersonal competences.

But development of the knowledge society is also increasing the demand for key competences in the personal and social spheres. The way in which people access information and services is changing, as are the structure and make-up of societies. There is a risk that many Europeans feel left behind and marginalised by the digital revolution. In the new digital world, citizens will need to master an increasing number of new technologies for work, leisure and communication. But technical skills will not be enough: people have to understand the nature, role and opportunities of new technologies and to be aware of issues regarding the validity and reliability of the information available. Increasingly, the ethical and legal aspects related to new technologies are raising concerns such as: how can we ensure that young people learn to apply the same values in a 'virtual' world as they do in the 'real' world?

In this climate of rapid change, there is increasing concern about our social cohesion. Growing internationalisation — plus the fact that societies are becoming more diverse —require us to rethink the ways democracy can be nurtured and enhanced. More than ever, constructive participation in society requires people to be informed and concerned about their society and to be active in it. The knowledge, skills and aptitudes that everyone needs must change as a result. Researchers say that "democracy can and should be learned", and that learning it should start at the very early stages of education and training.

Despite political acknowledgement of the role of education and training as part of the European project, and the number of good examples throughout Europe, the rate of progress measured across the EU is worrying. Ministers agreed, in 2003, five European benchmarks for education and training systems. Now, as the 2010 deadline approaches, it is clear that most of the targets will not be achieved. The chart below shows that we are making headway in reducing early school-leaving and increasing the completion rate of upper secondary education, but the rate is far too slow. Also, the target of reducing by 20% the proportion of low achievers in reading literacy as contained in the PISA survey will not be achieved. In fact, the 2006 PISA report suggests that the European average of poor readers is actually growing. The only benchmark achieved is the one for increasing the number of graduates in Maths, Science and Technology which is vital for the knowledge-based and increasingly digital economy. However, the number of female graduates has not increased since 2000.



Source: Annual Reports towards the Lisbon Objectives in Education and Training, updated 2008[1].

A European recommendation on key competences for lifelong learning

It is in the light of the developments and challenges described above that the Commission established a working group[2] in 2001 to work up a European framework of basic skills and key competences. The group's remit was to identify what those competences are, define them and create a framework for further work in the field. Member States' experts built on the OECD's Definition and Selection of competences project and on national curriculum developments[3] and came up with a proposal for a framework in 2004. This framework was the basis for a Commission proposal that, after negotiations, the Council and the European Parliament adopted at the end of 2006 as a Recommendation on key competences for Lifelong Learning.

The Recommendation introduces a European Framework of key competences which is a reference tool for policy makers, education and training providers, employers and learners themselves that can be used to support reforms. The Framework identifies and defines, for the first time at European level, the key competences that citizens require for their personal fulfilment, social inclusion, active citizenship and employability in a knowledge-based society. Member States' initial education and training systems should support the development of these competences for all young people, and provide all adults with opportunities to maintain and develop these skills and competences throughout life.

[1] Progress Towards the Lisbon Objectives in Education and Training — Indicators and Benchmarks 2007 http://ec.europa.eu/education/policies/2010/progressreport_en.html

[2] This work takes place within the Education and Training 2010 Work Programme and builds upon common objectives, indicators, benchmarks and peer learning. For details, see: http://ec.europa.eu/education/index_en.html

[3] Key competences: A Developing Concept in General Compulsory Education, Eurydice, Survey 5, 2002, ISBN 2-87116-346-4.

The European Framework defines competences as a combination of knowledge, skills and attitudes appropriate to the context. Key competences are those that support personal fulfilment and development, active citizenship, social inclusion and employment. The key competences are: (1) communication in the mother tongue; (2) communication in foreign languages; (3) basic competences in maths, science and technology; (4) digital competence; (5) learning to learn; (6) social and civic competence; (7) sense of initiative entrepreneurship; (8) cultural awareness and expression. These competences are defined in detail in the annex to this article.

The challenge of key competences — experiences from the joint work of the Commission and the Member States

Currently, within the Education and Training 2010 Work Programme, the Commission works with the Member States through eight 'clusters'. These are thematic working groups to which countries have sent their representatives. The eight clusters cover the following priority themes: teachers and trainers; access and social inclusion in lifelong learning; the use of ICT in education; maths, science and technology; making best use of resources; key competences and curriculum reform; modernisation of higher education; and recognition of learning outcomes.

The cluster entitled 'key competences — Curriculum Reform' follows up the implementation of the 2006 Recommendation[4]. In 2007 it organised three Peer Learning Activities (PLAs) during which Member State experts visited another country in order to compare their own policies and implementation strategies with others and to pinpoint common features in successful policy implementation.

The PLAs organised under the 'Key competences — Curriculum Reform' cluster in 2007 primarily focused on the first part of the Recommendation that calls for 'ensuring the development of key competences by all young people during their initial education and training'. Peer learning also looked at the essential reforms of vocational education and training (VET) and adult education in a perspective of a lifelong strategy.

The cluster concluded that initial education curricula in Europe increasingly reflect a shift of focus from imparting knowledge to developing competences that equip young people for adult life and further learning. In more concrete terms, this paradigm shift implies a growing emphasis on competences that include knowledge, skills and attitudes, which taken together give students a solid basis for further learning.

However, despite political will and clearly stated intentions, much more needs to be done to help young people to *integrate* the knowledge they have learned within subjects, and to be able to use the knowledge they have acquired[5]. The competence-based approach in teaching and learning aims to achieve this.

[4] A synthesis report on the cluster's activities is available at: http://ec.europa.eu/education/policies/2010/doc/peer07_en.pdf

[5] CIDREE 1998: Across the Great Divides. Report of the CIDREE Collaborative Project on Cross-Curricular Themes.

The cluster has also concluded that successful implementation of a curriculum based on key competences is not in contradiction with the organisation of learning in subjects that enable development of in-depth knowledge of a certain discipline and target the acquisition of specific skills. However, if the focus is on developing a full range of key competences for lifelong learning, subject knowledge should be seen more *as a first step that in itself is not sufficient to fully respond to the needs of learners in modern society.* The challenge is thus the systematic use of subject matter and the specific skills related to subjects as essential elements in the development of key competences and in particular those transversal ones. This requires all teachers, irrespective of their subject specialisation, to be aware of and feel responsible for developing their students' key competences in the overall school context.

The evidence the cluster has gathered from Peer Learning Activities[6] suggests that national reforms have used the Lisbon process as a useful framework for supporting the paradigm change from tacit knowledge to broader competences development. It has provided both a conceptual framework and practical means for exchanging experiences with other Member States through the Open Method of Coordination. The cluster highlights the fact that key competences should occupy a prominent place in national curricula and syllabuses. Teachers — the key to any change — should be supported through targeted continuous training and such training should be closely linked to school development. There is also a growing understanding of the key role *school leaders* have in promoting change and creating an ethos conducive to competence acquisition. In many countries the role of the inspectorate is changing towards more individualised support for each school; in others, that role has been given e.g. to pedagogical advisors. The cluster has also looked at the role of learning material in changing pedagogical practice in schools, and to what extent it can reflect the growing need for developing metacognitive skills ('learning to learn').

Overall, the cluster stresses that competence-based teaching and learning requires comprehensive and consistent systemic support. In this respect the key role played by assessment of competences deserves more attention: often only factual knowledge is measured, whereas the curricula stress the importance of skills and attitudes. Assessment *for* learning ('formative' assessment) needs to be given a greater role. Other forms of assessment such as summative assessment, school self-evaluation and external evaluations must form a consistent framework that will help harness evidence in order to improve learning, and thus contribute to developing all aspects of key competences. Moreover, as the slow progress towards European benchmarks indicates, there is concern regarding the very basic skills without which further learning would be difficult. The 2008 Spring European Council drew attention to the fact that one fifth of 15 year-olds in Europe can read only poorly, or not at all, and called for action to improve the situation. This will provide an impetus for the cluster to examine policies that can help improve reading literacy and other basic skills.

[6] For details, see the Synthesis Report at http://ec.europa.eu/education/policies/2010/doc/peer07_en.pdf

Conclusion

In a rapidly changing world young people will need a wider range of competences in order to flourish and to succeed in a globalised economy and increasingly diverse societies. Substantial work is underway in most Member States towards a major paradigm shift from teaching to supporting the development of key competences, and towards equity in opportunities, access, treatment and outcomes. Curricula and other national policy documents guiding lifelong learning provision increasingly reflect this approach. This work is supported by the Commission through the Education and Training Work Programme that provides Member States with mutual learning opportunities, and a forum for drawing conclusions on what policy measures most efficiently support schools in meeting the challenges they face.

The annexed Recommendation on key competences for lifelong learning aims to support these developments. It provides a common understanding on what the key competences are, thus helping national policy- and decision-makers to reflect upon their own systems in a wider context. It has also proved valuable as a common reference tool for joint work with Member States within the Education and Training 2010 Work Programme.

Annex: Key competences for Lifelong Learning – A European Reference Framework. Extract from the Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning[7].

[7] Recommendation 2006/962/EC (OJ L 394, 30.12.2006). Available at: http://ec.europa.eu/education/policies/2010/objectives_en.html#basic

ANNEX
Key competences for lifelong learning — A European reference framework

Background and aims

As globalisation continues to confront the European Union with new challenges, each citizen will need a wide range of key competences to adapt flexibly to a rapidly changing and highly interconnected world.
Education in its dual role, both social and economic, has a key role to play in ensuring that Europe's citizens acquire the key competences needed to enable them to adapt flexibly to such changes.
In particular, building on diverse individual competences, the differing needs of learners should be met by ensuring equality and access for those groups who, due to educational disadvantages caused by personal, social, cultural or economic circumstances, need particular support to fulfil their educational potential. Examples of such groups include people with low basic skills, in particular with low literacy, early school leavers, the long-term unemployed and those returning to work after a period of extended leave, older people, migrants, and people with disabilities.
In this context, the main aims of the Reference Framework are to:

1) identify and define the key competences necessary for personal fulfilment, active citizenship, social cohesion and employability in a knowledge society;
2) support Member States' work in ensuring that by the end of initial education and training young people have developed the key competences to a level that equips them for adult life and which forms a basis for further learning and working life, and that adults are able to develop and update their key competences throughout their lives;
3) provide a European level reference tool for policy makers, education providers, employers, and learners themselves to facilitate national and European level efforts towards commonly agreed objectives;
4) provide a framework for further action at Community level both within the Education and Training 2010 work programme and within the Community Education and Training Programmes.

Key competences

Competences are defined here as a combination of knowledge, skills and attitudes appropriate to the context. Key competences are those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment.
The Reference Framework sets out eight key competences:

1) Communication in the mother tongue;
2) Communication in foreign languages;

3) Mathematical competence and basic competences in science and technology;
4) Digital competence;
5) Learning to learn;
6) Social and civic competences;
7) Sense of initiative and entrepreneurship;
8) Cultural awareness and expression.

The key competences are all considered equally important, because each of them can contribute to a successful life in a knowledge society. Many of the competences overlap and interlock: aspects essential to one domain will support competence in another. Competence in the fundamental basic skills of language, literacy, numeracy and in information and communication technologies (ICT) is an essential foundation for learning, and learning to learn supports all learning activities. There are a number of themes that are applied throughout the Reference Framework: critical thinking, creativity, initiative, problem solving, risk assessment, decision taking, and constructive management of feelings play a role in all eight key competences.

1. Communication in the mother tongue[8]

Definition:

Communication in the mother tongue is the ability to express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing), and to interact linguistically in an appropriate and creative way in a full range of societal and cultural contexts; in education and training, work, home and leisure.

Essential knowledge, skills and attitudes related to this competence:

Communicative competence results from the acquisition of the mother tongue, which is intrinsically linked to the development of an individual's cognitive ability to interpret the world and relate to others. Communication in the mother tongue requires an individual to have knowledge of vocabulary, functional grammar and the functions of language. It includes an awareness of the main types of verbal interaction, a range of literary and non-literary texts, the main features of different styles and registers of language, and the variability of language and communication in different contexts.

Individuals should have the skills to communicate both orally and in writing in a variety of communicative situations and to monitor and adapt their own communication to the requirements of the situation. This competence also includes the abilities to distinguish and use different types of texts, to search for, collect and process information, to use aids, and to formulate and express one's oral and written arguments in a convincing way appropriate to the context.

A positive attitude towards communication in the mother tongue involves a disposition to critical and constructive dialogue, an appreciation of aesthetic qualities and a

[8] In the context of Europe's multicultural and multilingual societies, it is recognised that the mother tongue may not in all cases be an official language of the Member State, and that ability to communicate in an official language is a pre-condition for ensuring full participation of the individual in society. In some Member States the mother tongue may be one of several official languages. Measures to address such cases, and apply the definition accordingly, are a matter for individual Member States in accordance with their specific needs and circumstances.

willingness to strive for them, and an interest in interaction with others. This implies an awareness of the impact of language on others and a need to understand and use language in a positive and socially responsible manner.

2. Communication in foreign languages[9]

Definition:

Communication in foreign languages broadly shares the main skill dimensions of communication in the mother tongue: it is based on the ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing) in an appropriate range of societal and cultural contexts (in education and training, work, home and leisure) according to one's wants or needs. Communication in foreign languages also calls for skills such as mediation and intercultural understanding. An individual's level of proficiency will vary between the four dimensions (listening, speaking, reading and writing) and between the different languages, and according to that individual's social and cultural background, environment, needs and/or interests.

Essential knowledge, skills and attitudes related to this competence:

Competence in foreign languages requires knowledge of vocabulary and functional grammar and an awareness of the main types of verbal interaction and registers of language. Knowledge of societal conventions, and the cultural aspect and variability of languages is important.

Essential skills for communication in foreign languages consist of the ability to understand spoken messages, to initiate, sustain and conclude conversations and to read, understand and produce texts appropriate to the individual's needs. Individuals should also be able to use aids appropriately, and learn languages also informally as part of lifelong learning.

A positive attitude involves the appreciation of cultural diversity, and an interest and curiosity in languages and intercultural communication.

3. Mathematical competence and basic competences in science and technology

Definition:

A. Mathematical competence is the ability to develop and apply mathematical thinking in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence involves, to different degrees, the ability and willingness to use mathematical modes of thought (logical and spatial thinking) and presentation (formulas, models, constructs, graphs, charts).

B. Competence in science refers to the ability and willingness to use the body of knowledge and methodology employed to explain the natural world, in order to identify ques-

[9] It is important to recognise that many Europeans live in bilingual or multilingual families and communities, and that the official language of the country in which they live may not be their mother tongue. For these groups, this competence may refer to an official language, rather than to a foreign language. Their need, motivation, and social and/or economic reasons for developing this competence in support of their integration will differ, for instance, from those learning a foreign language for travel or work. Measures to address such cases, and apply the definition accordingly, are a matter for individual Member States in accordance with their specific needs and circumstances.

tions and to draw evidence-based conclusions. Competence in technology is viewed as the application of that knowledge and methodology in response to perceived human wants or needs. Competence in science and technology involves an understanding of the changes caused by human activity and responsibility as an individual citizen.

Essential knowledge, skills and attitudes related to this competence:

A. Necessary knowledge in mathematics includes a sound knowledge of numbers, measures and structures, basic operations and basic mathematical presentations, an understanding of mathematical terms and concepts, and an awareness of the questions to which mathematics can offer answers.

An individual should have the skills to apply basic mathematical principles and processes in everyday contexts at home and work, and to follow and assess chains of arguments. An individual should be able to reason mathematically, understand mathematical proof and communicate in mathematical language, and to use appropriate aids.

A positive attitude in mathematics is based on the respect of truth and willingness to look for reasons and to assess their validity.

B. For science and technology, essential knowledge comprises the basic principles of the natural world, fundamental scientific concepts, principles and methods, technology and technological products and processes, as well as an understanding of the impact of science and technology on the natural world. These competences should enable individuals to better understand the advances, limitations and risks of scientific theories, applications and technology in societies at large (in relation to decision-making, values, moral questions, culture, etc).

Skills include the ability to use and handle technological tools and machines as well as scientific data to achieve a goal or to reach an evidence-based decision or conclusion. Individuals should also be able to recognise the essential features of scientific inquiry and have the ability to communicate the conclusions and reasoning that led to them.

Competence includes an attitude of critical appreciation and curiosity, an interest in ethical issues and respect for both safety and sustainability, in particular as regards scientific and technological progress in relation to oneself, family, community and global issues.

4. Digital competence

Definition:

Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet.

Essential knowledge, skills and attitudes related to this competence:

Digital competence requires a sound understanding and knowledge of the nature, role and opportunities of IST in everyday contexts: in personal and social life as well as at work. This includes main computer applications such as word processing, spreadsheets,

databases, information storage and management, and an understanding of the opportunities and potential risks of the Internet and communication via electronic media (e-mail, network tools) for work, leisure, information sharing and collaborative networking, learning and research. Individuals should also understand how IST can support creativity and innovation, and be aware of issues around the validity and reliability of information available and of the legal and ethical principles involved in the interactive use of IST.

Skills needed include the ability to search, collect and process information and use it in a critical and systematic way, assessing relevance and distinguishing the real from the virtual while recognising the links. Individuals should have skills to use tools to produce, present and understand complex information and the ability to access, search and use internet-based services. Individuals should also be able use IST to support critical thinking, creativity, and innovation.

Use of IST requires a critical and reflective attitude towards available information and a responsible use of the interactive media. An interest in engaging in communities and networks for cultural, social and/or professional purposes also supports this competence.

5. Learning to learn

Definition:

'Learning to learn' is the ability to pursue and persist in learning, to organise one's own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. This competence means gaining, processing and assimilating new knowledge and skills as well as seeking and making use of guidance. Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training. Motivation and confidence are crucial to an individual's competence.

Essential knowledge, skills and attitudes related to this competence:

Where learning is directed towards particular work or career goals, an individual should have knowledge of the competences, knowledge, skills and qualifications required. In all cases, learning to learn requires an individual to know and understand his/her preferred learning strategies, the strengths and weaknesses of his/her skills and qualifications, and to be able to search for the education and training opportunities and guidance and/or support available.

Learning to learn skills require firstly the acquisition of the fundamental basic skills such as literacy, numeracy and ICT skills that are necessary for further learning. Building on these skills, an individual should be able to access, gain, process and assimilate new knowledge and skills. This requires effective management of one's learning, career and work patterns, and, in particular, the ability to persevere with learning, to concentrate for extended periods and to reflect critically on the purposes and aims of learning. Individuals should be able to dedicate time to learning autonomously and with self-discipline, but also to work collaboratively as part of the learning process, draw the

benefits from a heterogeneous group, and to share what they have learnt. Individuals should be able to organise their own learning, evaluate their own work, and to seek advice, information and support when appropriate.

A positive attitude includes the motivation and confidence to pursue and succeed at learning throughout one's life. A problem-solving attitude supports both the learning process itself and an individual's ability to handle obstacles and change. The desire to apply prior learning and life experiences and the curiosity to look for opportunities to learn and apply learning in a variety of life contexts are essential elements of a positive attitude.

6. Social and civic competences

Definition:

These include personal, interpersonal and intercultural competence and cover all forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life, and particularly in increasingly diverse societies, and to resolve conflict where necessary. Civic competence equips individuals to fully participate in civic life, based on knowledge of social and political concepts and structures and a commitment to active and democratic participation.

Essential knowledge, skills and attitudes related to this competence:

A. Social competence is linked to personal and social well-being which requires an understanding of how individuals can ensure optimum physical and mental health, including as a resource for oneself and one's family and one's immediate social environment, and knowledge of how a healthy lifestyle can contribute to this. For successful interpersonal and social participation it is essential to understand the codes of conduct and manners generally accepted in different societies and environments (e.g. at work). It is equally important to be aware of basic concepts relating to individuals, groups, work organisations, gender equality and non-discrimination, society and culture. Understanding the multi-cultural and socio-economic dimensions of European societies and how national cultural identity interacts with the European identity is essential.

The core skills of this competence include the ability to communicate constructively in different environments, to show tolerance, express and understand different viewpoints, to negotiate with the ability to create confidence, and to feel empathy. Individuals should be capable of coping with stress and frustration and expressing them in a constructive way and should also distinguish between the personal and professional spheres.

The competence is based on an attitude of collaboration, assertiveness and integrity. Individuals should have an interest in socio-economic developments and intercultural communication and should value diversity and respect others, and be prepared both to overcome prejudices and to compromise.

B. Civic competence is based on knowledge of the concepts of democracy, justice, equality, citizenship, and civil rights, including how they are expressed in the Charter of Fundamental Rights of the European Union and international declarations and how they are applied by various institutions at the local, regional, national, European and international levels. It includes knowledge of contemporary events, as well as the main events and trends in national, European and world history. In addition, an awareness

of the aims, values and policies of social and political movements should be developed. Knowledge of European integration and of the EU's structures, main objectives and values is also essential, as well as an awareness of diversity and cultural identities in Europe.

Skills for civic competence relate to the ability to engage effectively with others in the public domain, and to display solidarity and interest in solving problems affecting the local and wider community. This involves critical and creative reflection and constructive participation in community or neighbourhood activities as well as decision-making at all levels, from local to national and European level, in particular through voting. Full respect for human rights including equality as a basis for democracy, appreciation and understanding of differences between value systems of different religious or ethnic groups lay the foundations for a positive attitude. This means displaying both a sense of belonging to one's locality, country, the EU and Europe in general and to the world, and a willingness to participate in democratic decision-making at all levels. It also includes demonstrating a sense of responsibility, as well as showing understanding of and respect for the shared values that are necessary to ensure community cohesion, such as respect for democratic principles. Constructive participation also involves civic activities, support for social diversity and cohesion and sustainable development, and a readiness to respect the values and privacy of others.

7. Sense of initiative and entrepreneurship

Definition:

Sense of initiative and entrepreneurship refers to an individual's ability to turn ideas into action. It includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. This supports individuals, not only in their everyday lives at home and in society, but also in the workplace in being aware of the context of their work and being able to seize opportunities, and is a foundation for more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance.

Essential knowledge, skills and attitudes related to this competence:

Necessary knowledge includes the ability to identify available opportunities for personal, professional and/or business activities, including 'bigger picture' issues that provide the context in which people live and work, such as a broad understanding of the workings of the economy, and the opportunities and challenges facing an employer or organisation. Individuals should also be aware of the ethical position of enterprises, and how they can be a force for good, for example through fair trade or through social enterprise.

Skills relate to proactive project management (involving, for example the ability to plan, organise, manage, lead and delegate, analyse, communicate, de-brief, evaluate and record), effective representation and negotiation, and the ability to work both as an individual and collaboratively in teams. The ability to judge and identify one's strengths and weaknesses, and to assess and take risks as and when warranted, is essential.

An entrepreneurial attitude is characterised by initiative, pro-activity, independence

and innovation in personal and social life, as much as at work. It also includes motivation and determination to meet objectives, whether personal goals, or aims held in common with others, including at work.

8. Cultural awareness and expression

Definition:

Appreciation of the importance of the creative expression of ideas, experiences and emotions in a range of media, including music, performing arts, literature, and the visual arts.

Essential knowledge, skills and attitudes related to this competence:

Cultural knowledge includes an awareness of local, national and European cultural heritage and their place in the world. It covers a basic knowledge of major cultural works, including popular contemporary culture. It is essential to understand the cultural and linguistic diversity in Europe and other regions of the world, the need to preserve it and the importance of aesthetic factors in daily life.

Skills relate to both appreciation and expression: the appreciation and enjoyment of works of art and performances as well as self-expression through a variety of media using one' s innate capacities. Skills include also the ability to relate one's own creative and expressive points of view to the opinions of others and to identify and realise social and economic opportunities in cultural activity. Cultural expression is essential to the development of creative skills, which can be transferred to a variety of professional contexts.

A solid understanding of one's own culture and a sense of identity can be the basis for an open attitude towards and respect for diversity of cultural expression. A positive attitude also covers creativity, and the willingness to cultivate aesthetic capacity through artistic self-expression and participation in cultural life.

Getting started: discussions and choices

In the middle of a process. Key competences in a Swedish context.

— Ulla Lindqvist

Introduction

Opinions vary from time to time as to what constitutes important knowledge and what kind of knowledge school should teach. Changes in the world around us create new needs in the knowledge field. Attitudes and ideas relating to present-day knowledge and competence are, to a certain extent, heading in new directions, and it is becoming increasingly apparent that we are part of an international situation that will involve consequences for the school world. The task of school needs to be adjusted and adapted, and this also influences the formulation of the steering documents that are to communicate this to the people operating within the school system.

Swedish school is being faced with comprehensive reforms. A new goal and evaluation system and clearer knowledge requirements lie ahead for compulsory school[1], a new programme and course structure for upper secondary school,[2] and changes in the grading system for all types of schools[3]. If the proposals are carried out, this means that the school's task will, to a certain extent, be new and different. A reorganisation of the magnitude that the government has announced will involve new syllabuses and grading criteria that are sufficiently clear and powerful to control the education that will have effect far into the 21st century.

Pending government bills and parliamentary decisions, the National Agency for Education is preparing for the reform work ahead. It is in this context that the EU's recommended key competencies should be regarded[4]. With the prospect of formulating the new steering documents, different possibilities are also being discussed as to how we should deal with key competences within the framework of the Swedish curricula and syllabuses. It is also in connection with the implementation of the new syllabuses and grades to be introduced in the autumn of 2011 that the actual implementation of the key competences is expected to take place. In this chapter, some of the discussions that are taking place and the considerations that are being taken into account will be examined.

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1 SOU 2007:28. *Tydliga mål och kunskapskrav i grundskolan. Förslag till nytt mål- och uppföljningssystem.* Betänkande av Utredningen om mål och uppföljning i grundskolan. *(Clear Objectives and Knowledge Requirements in Compulsory School.* Proposal on a new system for Objectives and Follow Up. Commission Report from the Inquiry on Objectives and Follow Up in Compulsory School.) Stockholm 2007.

2 SOU 2008:27. *Framtidsvägen – en reformerad gymnasieskola.* Betänkande av Gymnasieutredningen. *(Path to the Future – a Reformed Upper Secondary School.* Commission report from Upper secondary education reform inquiry). Stockholm 2008.

3 Ds 2008:13. *En ny betygsskala.(A new grading scale.)* Stockholm: Regeringskansliet, Utbildningsdepartementet 2008 (Ministry of Education 2008).

4 Recommendation of the European Parliament and of the Council on Key competences for Lifelong Learning (2006/962/EC)

What is described is a very limited part of a comprehensive process that will run right on until the autumn of 2011, when the new reforms will start to apply.

Present systems

When the present curricula, syllabuses and grades were introduced in Sweden in 1994, a completely new way of thinking in relation to school's knowledge task was introduced.[5] A system managed by goals and results was introduced, and there was a radical change in focus regarding the view of what type of knowledge school should provide and how that knowledge should be expressed in curricula and syllabuses. Sweden was to leave behind a tradition of task-based syllabuses that prescribed direct knowledge content – the definitive substance of a subject – and was instead to highlight the indirect knowledge content – the skills and abilities that an individual develops *while* working with definite content. This indirect knowledge, up until then, had not been included in any syllabuses and it involved, in fact, a paradigmatic shift. The overall principles were formulated in 1992 in the report *Skola för bildning [School for cultural education]*[6] by the then Curriculum Committee in preparation for the new curricula and syllabuses that would be introduced in 1994.

Knowledge and competence
There is a major need in our times for a broader, more in-depth view of knowledge and competence. Throughout most of school's history, the knowledge that has been provided in the schools and been expressed in the steering documents has been neither contradicted nor reflected. It has, according to Professor Bernt Gustavsson, been deemed to be "decided by science and built into the cultural heritage. No more needs to be said. The knowledge that exists in practical activities is not termed as being knowledge. Knowledge is not problematised" (Gustavsson (2002) page 23).[7] Not until the 1980s did Swedish research start to show more of a serious interest in practical knowledge. Familiar knowledge and tacit knowledge were some of the areas that were studied.

In *Skola för bildning* (1992), an in-depth discussion is conducted on the concept of knowledge and on the complexity and variability of knowledge. The curriculum committee states that knowledge is not something static or definitive and that school does not therefore operate in a stable situation. *"Forms of knowledge, and what is counted as knowledge, vary from area to area and time to time. What counts as knowledge today is not the same as knowledge was yesterday nor what knowledge will be in the future," (Skola för Bildning. 1992 p.63).* The knowledge concept must therefore be discussed in the individual schools, and there is a need for constant reflection regarding its meaning.

[5] SOU 1992:94. *Skola för bildning.* Huvudbetänkande av läroplanskommittén. (*School for Cultural Education.* Commission report from Curriculum Committee.) Stockholm 1992
[6] Ibid.
[7] Gustavsson, B (2002). Vad är kunskap? En diskussion om praktisk och teoretisk kunskap. (*What is knowledge? A Discussion about practical and cognitive knowledge*) Stockholm: Skolverket.

This was included both in the curriculum for compulsory school (Lpo94)[8] and in the curriculum for secondary school and other voluntary types of schools (Lpf94).[9] It is emphasised that school's task of conveying knowledge presupposes *"an active discussion in the individual school about the concept of knowledge, about what is important knowledge today and in the future, and about how knowledge development takes place."* (Lpo94)

In order to describe "knowledge" in a way that would facilitate understanding and make the concept more manageable and more transparent, the curriculum committee introduced the four types of knowledge: facts, understanding, skills and accumulated experience. These four areas are different aspects of knowing about something and they are always included in practical and theoretical knowledge. They interact with and presuppose each other and they are not ranked in any particular order. The intention was not to give a detailed illustration of all the different aspects of knowledge, but to highlight some important types of knowledge. The committee explains that:
The purpose of separating different forms of knowledge is principally to demonstrate the diversity involved as regards how knowledge is expressed and to prevent any biased lessening of the knowledge phenomenon. At the same time, there is a risk that they can be perceived as occurring separately in a "pure" form in reality. All four types exist within all of the knowledge areas, but the emphasis of the different types can look different within different areas and between different people. (Skola för bildning (1992) page 67)

The curricula and syllabuses that were drawn up in 1994 and which, after a syllabus review in 2000, still apply, are based on this view of knowledge. There has been no notification of any changes in this regard in the run up to the impending reform work. When the four aspects were to be introduced into a definitive, national syllabus structure with several goal levels and a three-step scale of grading criteria, certain shifts occurred. The knowledge qualities that, within an area of knowledge, are expressions of understanding, skill and accumulated experience – three of the perspectives – were included in the national steering documents. The direct subject and course content was mainly to be decided by the school and was thus given, in practice, secondary significance at national level. This was the main principle, even if there are exceptions.

The changes in school's knowledge task ultimately fall back on societal changes and the idea that there is no longer a limited amount of knowledge that is to be taught. Everyone needs to be equipped with certain abilities but everyone does not have to learn the same things in practice. This approach is also a consequence of the steering system and the idea of decentralisation. The state specifies goals and expected results. The actual formulation of content and methods is decided by those who are to perform the task and who have responsibility for the goals and results being achieved. The shift from prescribing a set task to extrapolating abilities is part of this change. The Swedish syllabuses are thus, in

[8] *Läroplan för obligatoriska skolväsendet, förskoleklassen och fritidshemmet, Lpo94. (Curriculum For the Compulsory School System, the Pre-school Class and the Leisure-time Center, Lpo94)*
[9] *Läroplan för de frivilliga skolformerna Lpf 94. (Curriculum For the Non-Compulsory School System, Lpf 94)*

fact, competence-related, even if the competence concept was still not used in the 1994 steering documents.

Key competences in the Swedish kontext?

When the EU's eight key competences are introduced into Swedish curricula and syllabuses, two principles will meet that are fundamentally competence-based, with similar definitions, but that in their present application differ as regards one point in particular. The competences are defined as "a combination of knowledge, skills and attitudes appropriate to the context". The fundamental view of knowledge in the Swedish steering documents is based, as already mentioned, on a knowledge concept that has four aspects. It corresponds essentially with the definition of the key competences but the part of the knowledge concept that contains facts is not extrapolated at national level. A discussion that is being conducted at present is whether in future syllabuses it should also be given a central or main content. One argument is that it would not only increase the clarity of the syllabuses but also their regulatory force. This is proposed in two reports of current interest – in the report on goals and follow-up in compulsory school (2007)[10], and in the report on a reformed upper secondary school (2008).[11] It is too early to say whether government and parliament will accept the proposals.

A comprehensive question is, of course, how the pupils are to be able to achieve necessary key competences. The way in which they are included in and formulated in school's steering documents will have significance for how they are subsequently expressed in practical teaching. The key competences are already included in the Swedish curricula and syllabuses but it is not obvious how they are to be dealt with in future steering documents on the basis of the description and definition they have been given in the EU's framework. Shall we, for instance, regard certain key competences as purely subject-dependent or should they all be deemed as being cross-curricular and how, in that case, should we formulate that? Which key competences constitute a subject of their own as well as being cross-curricular and should therefore be included in most or all subjects? Should all the key competences be direct objects for the studies and thus be extrapolated explicitly, or can/should some of them be achieved indirectly via studies of the knowledge content itself? How, in that case, can we ensure that this occurs?

The way in which we answer these questions decides the formulation of curricula and syllabuses. One possibility that has been proposed is that the key competences should only be extrapolated at an overall level in the curriculum and thus not in the individual

[10] SOU 2007:28. *Tydliga mål och kunskapskrav i grundskolan.* Förslag till nytt mål- och uppföljningssystem. Betänkande av Utredningen om mål och uppföljning i grundskolan. (Clear objectives and knowledge requirements in compulsory school. Proposal on a new system for objectives and follow up. Commission report from the Inquiry on objectives and follow up in compulsory school). Stockholm 2007

[11] SOU 2008:27. *Framtidsvägen – en reformerad gymnasieskola.* Betänkande av Gymnasieutredningen. *(Path to the future – a reformed upper secondary school.* Commission report from upper secondary education reform inquiry). Stockholm 2008

subject syllabuses. Another thought is that certain competences could be regarded as being more general than others and only be formulated at a general curricular level such as learning to learn. Others can be regarded as being linked mainly to certain subjects such as mathematical competence and basic competences in science and technology and, in the first hand, be introduced into the syllabuses for these and related subjects. Yet others are certainly of a comprehensive character and ought to be included in all subjects, but the formulation needs to be adapted to the character of the individual subjects and therefore be written directly into each syllabus. Digital competence could be such a key competence, as could communication in the mother tongue. Mother tongue constitutes, moreover, a subject of its own.

Language and knowledge development hand in hand

Language is our main intellectual tool. Knowledge develops through language at the same time as a linguistic development takes place during the course of the knowledge work itself. Communication in the mother tongue is a natural key competence in all countries' education systems and it constitutes a central, independent subject in every curriculum. At the same time, more attention has been paid to the strong connection between linguistic development and knowledge development within all subject areas. The idea of introducing a linguistically developmental perspective into the syllabuses for subjects other than languages has therefore been brought up again in the National Agency for Education's internal discussions in preparation for the pending syllabus work. In a recently published thesis at Uppsala University,[12] the preconditions for the pupils' linguistic development in the teaching of some subjects other than language are studied, as well as what kind of communicative competence the pupils can develop in the programme-specific subjects studied. On the basis of her thesis, the author has also performed a research summary[13] on behalf of the National Agency for Education on "Language and the subject", linked to the communication in the mother tongue key competence.

The scientific study has been performed on two vocationally oriented programmes at upper secondary school – the Health Care Programme and the Vehicle Programme – focusing on the spoken language. The study shows how different linguistic practices and cultures develop in the two vocational programmes and how this influences the pupils' possibilities for developing their language and, thus, also their knowledge of the programme-specific subjects that have been studied. In the class on the Health Care Programme, the pupils were confronted with very varying methods of working in the programme-specific subject examined, with plenty of opportunities for participating in discussions in small as well as large groups. They used context-dependent as well as context-reduced registers in their reasoning. In the Vehicle Programme class, two pupil groups with different speciali-

[12] Palmér A. (2008). *Samspel och solostämmor. Om muntlig kommunikation i gymnasieskolan.* Akademisk avhandling. Uppsala: Uppsala universitet. (*Interacting and going solo. On oral communication in upper secondary schools.* Thesis. Uppsala University.)
[13] Palmér A. (2008). *Språk och lärande.* Forskningsöversikt. Promemoria. (*Language and Learning.* Research summary. Memorandum.) Stockholm: Skolverket.

sations and different teachers in one of the programme-specific subjects were studied. The one group, in the same way as the group on the Health Care Programme, gained experience of different types of communication and of discussion, and had many opportunities for participating in discussions. The other pupil group on the Vehicle Programme, on the other hand, was confronted with a much more limited range of types of communication and conversation. The reasoning in connection with the practically oriented work was often context-dependent and the teaching was seldom organised in such a way that the pupils were given the opportunity to work linguistically on their skills. In comparison with the other two groups, this group was linguistically neglected.
Some of the explanations given for these differences turn out to be teachers with different styles of leadership, relations between teachers and pupils and between pupils themselves, different values regarding how teaching should be performed and what knowledge the pupils need most, which is reflected in how the teaching is organised.

To sum up, the research on linguistic development, oral and written communication and subject-dependent language use shows, according to the research summary[14], that language development and knowledge development go hand in hand. Language promotes knowledge development and, through knowledge, language develops. Language develops by being used in oral and written communication in meaningful, social contexts in which the individual is confronted with and has to cope with increasingly great linguistic challenges. In a classroom where a constructive dialogue is in progress, pupils' knowledge development as well as their linguistic development is benefited. This is partly due to the pupils being given plenty of scope for participating in the communication that is going on, through a listening culture in which individual, communicative contributions are caught up and further developed in exhaustive discussions. Learning, as well as linguistic development, is reinforced both by methods of work and types of communication being varied. This can mean that different forms of discussion are organised, that the pupils can test as many different roles in classroom communication as possible, and that the pupils are given the opportunity to read and discuss different types of texts during teaching, and to write in different genres. Metareflection is yet another tool in the teaching process: being able to pause in connection with an item, a method of working or a genre and, by way of discussion or in writing, to reflect over the work that is in progress. The purpose is to increase the awareness of the subject area being studied at that moment, but also to lay a foundation for the ability to act with consciousness. Receiving constructive response from teachers and friends as regards form and content of texts and oral work is also of great significance for learning as well as for language development.

Subject tuition can offer numerous opportunities for using language in meaningful, communicative and challenging contexts. One condition is that the teacher is conscious of the mutual link between the pupil's command of language and knowledge development and that the teacher is capable of modelling the teaching in such a way that a positive language development as well as knowledge development in the subject also takes place.

[14] Ibid.

If language is utilised consciously as a learning tool in all subjects, there will be positive consequences both for the pupils' knowledge development in the respective subject and for their language development.

There is, in other words, great potential for teachers skilled in their subject to consciously and methodically introduce a linguistically developmental perspective into their teaching, which will also benefit the learning of the individual subject. Every teacher has specific competence in their subject's special language and they are specialists in the different social and linguistic practices included in their subject area. They have a command of subject-specific terms and concepts, can read and assimilate information within the subject area, and can talk about and express themselves in writing about their subject. The idea, however, is *not* that all teachers should be language teachers, which is emphazised in the study. Assessment and guidance of pupils in questions of linguistic correctness and possession of in-depth knowledge of written and oral communication are within the scope of language teachers' specific competence.

A considerable amount of professional development is going to be needed. This approach is new for many subject teachers, while research shows that the obstacles to and possibilities for the pupils' language development that exist in school depend both on the communication in the teaching and on how the teaching is organised.

Professors who wish to make further inventory of which subject-linguistic competence a subject requires and what its purpose is can see in the memorandum[15] examples of a number of questions based on the EU definition of the key competence concept, like:

What specific linguistic skills are needed within the subject? What words and concepts, what genres and linguistic styles are in vogue at present? What types of subject-dependent oral and written communication are important to know about, and what are the norms that apply to them?

In what contexts and for what purposes does one need to be able to communicate within the subject? In what oral context does one have to be able to act, in what roles and for what purposes? What sorts of texts does one need to be able to read and work on? What genres does one need to be able to produce oneself? What does one need to be able to describe, explain, account for, argue for or against, decide on, draw conclusions from etc? What aids does one need to be able to use in the communication of the subject?

What approaches to subject-dependent communication are needed to enable participation in meaningful communicative contexts in and on the subject?

[15] Ibid.

Support during competence assessment

Part of the process that is under way at the National Agency for Education in preparation for the notified reforms is discussion on changes in syllabus structures and on how goals and grading criteria can be more clearly formulated. An important question on which to take a stance in this context is how the key competences should be assessed and graded.

If the key competences are to be included in the syllabuses' goals and grading criteria, they must, on the basis of the description and definition they are given in the EU framework, be able to be introduced into Swedish steering documents within the structure of the Swedish curriculum's view of knowledge (see also the previous section). As support for the teachers' grading, the Swedish system has national grading criteria for a three-step scale of grades, and these criteria are linked to the goals for the subject (compulsory school) or the course (upper secondary school). The grading criteria express abilities, or knowledge qualities, such as the ability to describe, account for, summarise, analyse and evaluate. As the actual knowledge content is decided at local level, it is not included in the national grading criteria. The teacher's grading is performed with the support of the knowledge qualities of three grading steps described in the national grading criteria, on the basis of the knowledge content that has in fact been included in the teaching.

Facts are one of the four types of knowledge which, together with understanding, skills and accumulated experience, are included in the extended knowledge concept that already exists in the Swedish curricula. Knowledge, meaning facts, is also included as one of three parts in the EU's description and definition of the competence concept. Knowledge and competence in the extended definition therefore acquire a wider meaning that goes beyond facts and subject matter, instead meaning knowledge as preparedness and a desire to act knowledgeably.

The assessment and grading of knowledge as a set task is relatively simple and can be done with the help of, for instance, written tests. Performing a competence assessment and awarding grades on the basis of the extended meaning in the knowledge and competence concept is, on the other hand, much more difficult. Giving the assessor satisfactory support is therefore a central task when formulating the grading criteria.

Model for assessment

A proposal for a new model for formulating grading criteria has been drawn up within the National Agency for Education and is under discussion at present (spring 2008). There is a need for a joint system for the construction of grading criteria in all subjects that clarifies the grading criteria's progression. The tentative model briefly presented here shows an attempt to draw up a clear structure from which to work when goals and grading criteria are to be formulated and when they are to be communicated with those working in school. A structure like this could be used if a decision is made for central or principle content to be written into the national syllabuses. It also provides the possibility of introducing the EU´s key competences according to their definition within the same framework, if it is decided to do so.

A comprehensive idea in the proposed model that has been drafted is that it can cover the syllabuses' different goals while serving as a model for the construction of grading criteria in future syllabuses. The idea is also that it should be able to be applied both on the basis of the Swedish view of knowledge and on the structure in the EU's recommendations regarding key competences.[16] If this model would be deemed to be interesting, some form of knowledge content must be described in the national syllabuses. It is not possible, in other words, to apply the intended model at national level unless, at a minimum, information about content is included in the syllabuses and, thus, also in the grading criteria. As has already been mentioned, proposals have been put forward about this in two reports of immediate interest.[17] [18] It is too early to say whether these proposals will be realised.

Three legs

The model that is under discussion is based on three dimensions[19]: a knowledge dimension, a cognitive dimension and an action dimension or, using other terms: knowing (K), thinking (T) and acting (A). Such a structure corresponds relatively well both with the types of knowledge included in the Swedish curricula - facts, understanding, skills and accumulated experience - as well as the European Parliament's and Council's definition and structure of competence in terms of knowledge, skills and attitudes.[20] The character of the subject and the level of tuition will decide which leg will bear the greatest weight. The different dimensions will be emphasised differently depending on whether, for instance, it is a beginners' course or an advanced course at upper secondary school level. For the beginners' course, the emphasis can be more on the knowledge dimension and lower cognitive levels while, for a more advanced course, it can be more on the higher cognitive levels and on the action dimension.

Knowledge dimension

Knowledge, or knowing, means in this context facts, concepts and procedures. Also included is such material as is covered by collective knowledge and which will be passed on to future generations. The grading criteria for different grading levels could be able to specify the breadth of knowledge required for the different steps on the grading scale. One condition for being able to introduce a knowledge dimension into the national grading criteria is, as has already been mentioned, that some form of knowledge content is introduced into future national syllabuses. In relation to the present view of knowledge in Swedish curricula and syllabuses, the knowledge dimension (K) has a meaning additional to the Swedish "facts", while this is more in agreement with the knowledge aspect in the EU's framework of key competences.

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[16] Recommendation of the European Parliament and of the Council on key competences for Lifelong Learning (2006/962/EC)

[17] SOU 2007:28. Tydliga mål och kunskapskrav i grundskolan. Förslag till nytt mål- och uppföljningssystem. Betänkande av Utredningen om mål och uppföljning i grundskolan. (*Clear objectives and knowledge requirements in compulsory school.* Proposal on a new system for objectives and follow up. Commission report from the Inquiry on objectives and follow up in compulsory school.) Stockholm 2007.

[18] SOU 2008:27. Framtidsvägen – en reformerad gymnasieskola. Betänkande av Gymnasieutredningen. (*Path to the Future – a Reformed Upper Secondary School.* Commission report from Upper secondary education reform inquiry). Stockholm 2008.

[19] Anderson&Krathwohl (2001). *A taxonomi for learning, teaching and assessing.* London: Longman.

[20] Recommendation of the European Parliament and of the Council on key competences for Lifelong Learning (2006/962/EC)

Cognitive dimension
This dimension sets forth the ability to think and reflect over the knowledge that has been acquired. In the model under discussion at present (spring 2008), the term "thinking" (T) is used. In relation to the knowledge concept that exists at present in Swedish curricula and syllabuses, the cognitive dimension corresponds mainly to the "understanding" knowledge type. In relation to the EU's competence concept, the cognitive dimension "thinking" (T) corresponds mainly to "cognitive skills".

A cognitive dimension could be divided into categories such as *remember, understand, apply, analyse, evaluate and create*, according to Anderson & Krathwohl's classification.[21] It is possible to use these different cognitive categories in a scale of values if this is accepted as appropriate in relation to grades. It is, at the same time, important to emphasise that the intention in that case is for all cognitive categories to be included in the teaching. The intention is then also for all cognitive categories to be part of the assessment for every grade but with different emphasis for lower and higher grades.

It is important to note that the evaluation that is made of an individual's ability to remember, understand, apply, analyse etc. in connection with grading and with the support of grading criteria only applies in relation to the specific knowledge content for the subject or the course that is being graded. It is not a question of an evaluation of an individual's general cognitive ability. A pupil can be at a cognitive level as regards one area of knowledge but at a completely different level in another area. There can be a difference both between subjects and within the same subject for the same pupil.

Action dimension – to do
With regard to theoretical role models, the action dimension is the least clear of the three dimensions. Dependency on the character of the subject is noticeable here and, above all, certain subjects involve more explicit demands regarding action in practice. This applies, for instance, to practical aesthetic subjects, laboratorial subjects and vocational subjects at upper secondary school. In the underlying documentation for discussion, the action dimension is intended also to include the will and intention to act, which is emphasised strongly in connection with that part of the EU's competence concept that deals with attitudes. The grading criteria, in that case, could describe the ability and will to take initiative, and to act and actively apply one's knowledge and cognitive abilities. It is in this context also important to emphasise that what is referred to here and is to be evaluated for grading is a form of action that is based on knowledge and cognitive abilities in the subject or course that is to be graded. It is not a question of action in itself, as a general competence. Compared with current syllabuses, the action dimension could almost be said to correspond to the Swedish knowledge types – skill and accumulated experience. In relation to the EU's competence concept, it is most comparable with parts of the "skills" aspect, in particular practical skills, and "attitudes".

[21] Anderson&Krathwohl (2001). A taxonomi for learning, teaching and assessing. London: Longman.

To summarise, the most highly valued competence would be active, knowledgeable action on one's own initiative, based on solid (memory) knowledge and well developed cognitive abilities.

Progression

Different kinds of progression are reflected in different ways. The goals express a progression between different school years and between different courses in the same subject. A pupil of 16 years of age in school year nine, for instance, has a broader bank of knowledge to work with than a pupil in school year six, who is 13 years old. The pupils acquire an increasing number of cognitive tools with which to process their knowledge and, thanks to that, an increasingly good ability to solve problems, analyse and develop their creativity. Even the action dimension increases in different ways depending on education. It can be a question of greater skill at crafts or an improved ability to act in, for instance, linguistic or social situations.

Grades are also a form of progression that are expressed with the help of grading criteria. In order for the three dimensions – knowing (K), thinking (T) and acting (A) – to be applied in the grading criteria, it must be possible to describe an increased complexity within each dimension as well, and this is deemed to be quite possible. To illustrate the overall idea, examples are given here of the model that is at present (spring 2008) under discussion (table 1). Grading criteria have been formulated at a general level without any connection to a particular subject.

Grade	Knowing (K)	Thinking (T)	Acting (A)	Criterion (K+T+A)
MVG	Masters more or less all knowledge in the form of facts, concepts and standard methods that have been taken up during teaching	Creates, evaluates and analyses.	Acts independently and creatively.	Masters most of the area of knowledge. Can apply his or her knowledge very well, perform high-class analyses and evaluations and can independently create, on his or her own initiative, high quality products.
VG	Has good overall view of the knowledge area in question.	Analyses and conducts more qualified applications.	Acts on his or her own initiative; good skills.	Has good overall view of the knowledge area. Performs certain analyses and some more qualified applications. Acts on his or her own initiative and demonstrates good skills.
G	Is acquainted with the central parts of the knowledge area in question.	Renders, understands, and applies at an elementary level.	Acts with certain support; masters elementary skills.	Has the knowledge required and can render and apply it. Acts with support and demonstrates basic skills.

G = Pass VG = Pass With Distinction MVG = Pass With Special Distinction (Table 1)

The table can be interpreted in two directions. When moving upwards in the matrix with grade criteria, the grade value increases. When moving to the right, there is a qualitative development. The first dimension, "knowing", acts as a sort of base for the other two dimensions. "Thinking" presupposes the "knowing" dimension and, for the "acting" di-

mension to develop, the other two are presupposed. What is to the left is a condition for the dimension that follows to be able to develop with a high quality level. The cognitive dimension cannot be assessed without knowledge, otherwise it will be empty. Some form of knowledge is thus a necessary condition for assessment of the cognitive dimension "thinking" (T) within the scope of a subject or a course. The grade criterion that is finally formulated on the basis of the three dimensions is a comprehensive, holistic description of a knowledge profile on three levels. It is important to note that it is a subject-specific, cognitive ability that is to be assessed, not some form of general, cognitive ability. The same reasoning can be used as regards the third dimension, "acting" (A). For the action (A) to be competent, knowledge (K) as well as the thinking dimension (T) are both required.

Cultural expression is one of the EU's eight key competences. In Swedish compulsory school, this corresponds most closely with the subject "art". Table 2 presents an example of how grade criteria in art for school year 9 could be formulated according to the same model. As material in support of the example, the proposals for "Goals for teaching", "Main content" and "Knowledge requirements" for art in year 9 are used, which can be found in the report on goals and follow-up in compulsory school.[22]

The schematic descriptions in tables 1 and 2 are only to be regarded as principle sketches that need to be discussed further. No decisions have been made.

[22] SOU 2007:28. *Tydliga mål och kunskapskrav i grundskolan.* Förslag till nytt mål- och uppföljningssystem. Betänkande av Utredningen om mål och uppföljning i grundskolan. (*Clear objectives and knowledge requirements in compulsory school.* Proposal on a new system for objectives and follow up. Commission report from the Inquiry on objectives and follow up in compulsory school.) Stockholm 2007.

Art

Criteria for school year 9 (16 years old)

Criteria in three dimensions, summarised

Grade	Knowing (K) (facts, concepts, methods)	Thinking (T) (renders, understands, applies, analyses, evaluates, creates)	Acting (A)	Criterion (K+T+A)
MVG	The pupil has very good knowledge of and an overall view of different techniques and materials for producing pictures and figures. The pupil has very good knowledge of the different purposes for using pictures and how pictures and visual media have been used historically for different purposes, and is very well-oriented in the development of the visual arts and current forms of expression.	The pupil analyses and discusses different pictures on the basis of how similar pictures have been used in different contexts and on the basis of the pupil's own interpretation. The pupil can explain and argue for his or her way of depicting their own pictures and discuss different possible interpretations from different perspectives – art history, political- aesthetic, religious etc. The pupil demonstrates a good ability to analyse pictures from different epochs on the basis of both contemporary and historical perspectives.	Acts independently and creatively and shows considerable confidence in the production of pictures and figures, both with regard to techniques and material. Communicates in an effective and well-informed way with the help of different types of pictures, visual media and other forms of illustrative and elucidatory material.	The pupil has very good knowledge of different techniques and materials for creating pictures and can apply them in a creative, confident way when creating pictures, illustrations and different types of designs. The pupil can combine different techniques and materials in a creative, personal way and can thus effectively convey different types of messages and experiences. The pupil can discuss and explain his or her ambitions and can analyse his or her own work as regards purpose and method of production. The pupil in that connection demonstrates very good knowledge of art and the use of art throughout history and in the present, and can discuss risks and possibilities relating to modern visual media and their use. The pupil uses pictures and picture production creatively during oral and written presentations.
VG	The pupil is well acquainted with simpler as well as more advanced techniques and methods for picture production. The pupil has good knowledge of how pictures can be used for different purposes and of different historical and contemporary art styles.	The pupil can describe different purposes for using pictures and can give examples of how pictures have been used for different purposes during different epochs. The pupil analyses and discusses pictures and their use and purposes, and how these have changed over time. The pupil identifies pictures from different epochs and can motivate his or her suggestions.	The pupil produces pictures and figures with the help of different techniques and materials and creates his or her own pictures and figures both by applying established methods and by making combinations in his or her own way. The pupil uses pictures in a systematic, substantiated way in order to communicate and convey meaning.	The pupil is well acquainted with different techniques and materials for creating pictures, and applies these in a varied way when creating different types of pictures, illustrations and figures. The pupil can give clear examples of how pictures have been used for different purposes in different epochs and in different contexts. The pupil analyses and discusses different types of pictures with reference to their method of production and purpose. The pupil consciously uses pictures and illustrations for written as well as oral presentation and communication.
G	The pupil knows how certain pictures have been produced and the different purposes of pictures, and some different techniques for producing pictures. The pupil knows some different art history epochs and some contemporary art genres.	The pupil can explain some different purposes for using pictures and can give examples of pictures that have been used. The pupil can discuss pictures of different kinds and from different epochs and can suggest possible purposes of different pictures.	The pupil produces pictures and figures with the help of different techniques and materials and applies simple rules for creating pictures. The pupil uses pictures in order to communicate and to convey meaning.	The pupil is acquainted with different techniques and materials for creating pictures and applies his or her knowledge for simple picture production. The pupil can give examples of how pictures are used for different purposes and can also give examples of some well-known pictures from different art epochs. The pupil can discuss possible purposes of certain pictures and can apply pictures and illustrations in order to convey meaning both orally and in writing.

(Table 2)

At last

What has been described in this chapter, is a very limited part of a comprehensive process. The examples given to illustrate some of the discussions that are taking place and the considerations that are being taken into account, have to be regarded as part of a greater whole. Many complex questions with relevance for the announced reforms, and for the key competencies, have to be solved before any decisions can be made. The government has declared autumn 2011 to be the starting point of the reforms to apply. At that time the final version of how the key competences have been incorporated into the Swedish steering documents and implemented in the schools can be presented.

References

Anderson&Krathwohl (2001). *A taxonomi for learning, teaching and assessing.* London: Longman.

Ds 2008:13. *En ny betygsskala. (A new grading scale.)* Stockholm: Regeringskansliet, Utbildningsdepartementet 2008 (Ministry of Education 2008).

Gustavsson, B (2002). *Vad är kunskap?* En diskussion om praktisk och teoretisk kunskap. (*What is knowledge?* A Discussion about practical and cognitive knowledge) Stockholm: Skolverket.

Läroplan för obligatoriska skolväsendet, förskoleklassen och fritidshemmet, Lpo94. (Curriculum For the Compulsory School System, the Pre-school Class and the Leisure-time Center, Lpo94)

Läroplan för de frivilliga skolformerna Lpf 94. (Curriculum For the Non-Compulsory School System, Lpf 94)

Palmér A. (2008). *Samspel och solostämmor. Om muntlig kommunikation i gymnasieskolan.* Akademisk avhandling. Uppsala: Uppsala universitet. (*Interacting and going solo. On oral communication in upper secondary schools.* Thesis. Uppsala University.)

Palmér A. (2008). *Språk och lärande.* Forskningsöversikt. Promemoria. (*Language and Learning.* Research summary. Memorandum.) Stockholm: Skolverket.

Commission of the European Communities (2006) *Recommendation of the European Parliament and of the Council on key competences for Lifelong Learning,* Brussels: European Commission 2006/962/EC

SOU 1992:94. *Skola för bildning.* Huvudbetänkande av läroplanskommittén. (*School for Cultural Education.* Commission report from Curriculum Committee.) Stockholm 1992

SOU 2007:28. *Tydliga mål och kunskapskrav i grundskolan. Förslag till nytt mål- och uppföljningssystem.* Betänkande av Utredningen om mål och uppföljning i grundskolan. (*Clear Objectives and Knowledge Requirements in Compulsory School.* Proposal on a new system for Objectives and Follow Up. Commission Report from the Inquiry on Objectives and Follow Up in Compulsory School.) Stockholm 2007.

SOU 2008:27. *Framtidsvägen – en reformerad gymnasieskola.* Betänkande av Gymnasieutredningen. (*Path to the Future – a Reformed Upper Secondary School.* Commission report from Upper secondary education reform inquiry). Stockholm 2008.

Key Skills in Senior Cycle: An approach to embedding key skills in the curriculum at upper secondary in Ireland

— *Anna Walsh*

Introduction

I found that learning is definitely more effective if you implement these skills and testing students has verified this. New methodologies are leading to better learning (maths teacher reflection).

Using the key skills has really helped me to get a deeper understanding of English, I am now better at thinking for myself and find the class is so much more enjoyable. We can all contribute to the learning— not just the teacher (Students of English reflection).

It is a long way from the concept of key skills in the curriculum to the words of teachers and students. This paper presents an account of that journey. It begins with an overview of some aspects of the Irish post-primary education system, then discusses the origins of the concept of key skills in the Irish context, and finally, describes a project that brought key skills to classrooms with some surprising results.

Second level education in Ireland

Second level education consists of a three-year junior cycle (lower secondary), followed by a two or three year senior cycle (upper secondary), depending on whether an optional Transition Year[1] is taken. It is usual for students to commence the junior cycle at age 12. A state examination, the Junior Certificate, is taken after three years. The principal objective of the junior cycle is for students to complete broad, balanced and coherent courses of study in a variety of curricular areas, and to allow them to achieve levels of competence that will enable them to proceed to senior cycle education. Senior cycle education in Ireland caters for students in the 15 to 18 year age group. During the final two years of senior cycle students take one of three programmes, each leading to a state examination—the Leaving Certificate, the Leaving Certificate Vocational Programme (LCVP) or the Leaving Certificate Applied (LCA).

The long established, Leaving Certificate examination is the terminal examination of post-primary education and is taken when students are typically 17 or 18 years of age. Syllabuses are available in 34 subjects. All subjects are offered at two levels, ordinary and higher. Irish and Mathematics are also available at foundation level. Students preparing

[1] Transition year is an optional year which immediately follows on from lower secondary education. It provides an opportunity for students to experience a wide range of educational inputs free from formal examination before they progress to senior cycle education.

for the Leaving Certificate examination are required to take at least five subjects, one of which must be Irish. The Leaving Certificate is the main basis upon which places in universities, institutes of technology and colleges of education are allocated, through a points system. The Leaving Certificate Vocational Programme (LCVP) was introduced in 1989 and modifies the traditional Leaving Certificate Programme, with a more vocational focus. The Leaving Certificate Applied (LCA) Programme was introduced in 1995 and is a self contained two-year course. It is a person-centred course involving a cross-curricular approach rather than a subject based structure. It has as its primary objective the preparation of participants for adult and working life through relevant learning experiences.

Towards the development of a key skills framework

In March 2000, the Lisbon European Council called upon the Member States, the Council and the Commission to establish a European framework defining 'the new basic skills' to be provided through lifelong learning. This is in line with an international trend towards the development of skills in primary and secondary education in many developed countries. The basic skills can be grouped around thinking skills, personal skills and life-long learning skills and all are seen as essential in helping young people cope with the changes brought about by globalisation and the knowledge based society. The ability to think critically and creatively, innovate and adapt to change, work independently and in a team and the ability to reflect on oneself as a learner are prerequisites for life and for the work place in the 21st century.

A review of senior cycle education in Ireland which commenced in 2002 has presented many areas of interest. Following the publication of a discussion paper *Developing Senior Cycle Education: Issues and Options* (NCCA, 2002) the National Council for Curriculum and Assessment (NCCA)[2] initiated a consultation process through which they sought the views of students, parents, teachers, school management, educational and social bodies, and other interested individuals and groups, on how senior cycle should develop into the future. The consultation revealed, among other findings, that 'pressures of examinations led to students in such classrooms spending considerable amounts of time in note-taking, memorisation and text-book based work'. In addition, NCCA commissioned research on international developments in senior cycle education (NCCA, 2003). The challenge was to draw on the findings of the various consultations in deciding the direction for change (NCCA, 2003). One of the outcomes was a decision for NCCA to proceed with the development of a key skills framework.

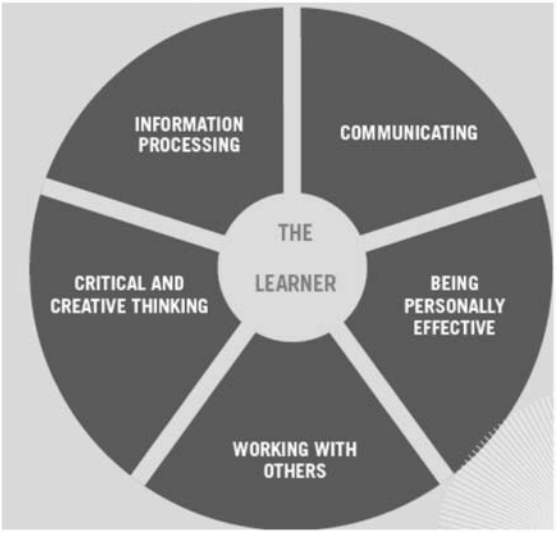
There was much discussion through the consultation and the subsequent development of the key skills about whether they should be called skills or competences. While they have been developed to encompass a combination of skills, knowledge, aptitudes and attitudes, and to include the disposition to learn in addition to know-how, in line with the

[2] The role of the NCCA is to lead developments in curriculum and assessment and to support the implementation of changes resulting from this work.

European Reference Framework, the use of the term 'skills' was preferred by many in the discussions around the consultation.
NCCA has developed a key skills framework in which each key skill is broken down into essential elements and learning outcomes. The elements further describe the skill, clarifying the knowledge, skills, aptitudes and attitudes that learners will develop. The learning outcomes indicate what students might show as evidence of achieving in the key skill (the full framework is available to download from www.ncca.ie). The OECD DeSeCo Project (Definition and Selection of competences) (2000)) and the extensive review of 35 frameworks on thinking and learning by Moseley and his colleagues at the University of Newcastle (2005) informed the development of the NCCA Key Skills Framework.

From and Irish perspective, the key skills of information processing, being personally effective, communicating, critical and creative thinking and working with others were identified as being important for all students to achieve to the best of their ability, both during their time in school and into the future and to participate fully in society, in family and community life, the world of work and lifelong learning. Embedding the key skills in the curriculum will unlock a range of learning experiences for students, improving their present and future access to learning, their social interaction, their information and communication abilities and their ability to work collaboratively.

The framework is presented as an integrated framework indicating the strong relationships between each of the five skills and their impact on the development of the learner. As learners develop competences in each of the key skills they will grow in their knowledge about, and skills in, learning in general and their own learning in particular.



Five key skills

Each key skill has associated elements and learning outcomes. The elements further describe the skills that students will develop (see appendix 1). The learning outcomes are constructed at a behavioural level and indicate what the students might show as evidence of achieving the key skill.

Information-processing
The purpose of this key skill is to help students become more effective learners in an information-intensive environment. As well as developing the specific skills of accessing, selecting, evaluating and recording information, learners will need to develop an appreciation of the differences between information and knowledge. In particular, they will need to learn that the mere availability of information does not guarantee knowledge, and that people need skills to create both personal and shared knowledge from information sources.

Critical and creative thinking
The purpose of this key skill is to help learners be more aware of different forms and patterns of thinking so that they can become more skilled in higher order reasoning and problem-solving. As well as becoming more adept with different forms of thinking, they will need to understand that thinking is shaped by cultural and historical values. Students will find it useful to critically reflect on what forms of thinking and values have shaped their own perceptions, opinions and knowledge.

Communicating
The purpose of this key skill is to help learners recognise how central communication is for human relationships of all kinds and to become better communicators in both formal and informal situations. As well as developing specific skills in a variety of media they will need to form a deeper understanding of the power of communication—particularly language and images—in the modern world.

Working with others
The purpose of this key skill is to highlight the role that working with others has for learning and for reaching both collective and personal goals. As well as helping learners gain some appreciation of the dynamics of groups and the social skills needed to engage in collaborative work, they will need to recognise that working collectively can help motivation, release energy and capitalise on all the talents in a group. On a wider scale, working collectively is important for social cohesion and for engaging with diverse cultural, ethnic and religious groups.

Being personally effective
The purpose of this key skill is to help young people grow as persons, to become more self-aware, and to use that knowledge to develop personal goals and life plans. As well as giving learners specific strategies related to self-appraisal, goal-setting and action plan-

ning, an important dimension of this key skill is to help young people recognise how to get things done, through garnering resources (people and technology), and to act autonomously according to personal identities and personal values.

Toward learning
One of the underlying principles of senior cycle is to improve the learning experiences of the learner and to encourage them to develop the knowledge, skills, attitudes and values that will enable them to become more effective and independent learners and to develop a lifelong commitment to improving their learning. Learning how to learn requires the development of positive beliefs about learning and a willingness to engage in new learning situations. This emphasis on learning will assist students to take more responsibility for their own learning as they proceed through their senior cycle education, gradually decreasing their levels of dependency on teacher direction. Toward learning is an overarching skill that is linked to learning how to be more skilful in the other five skills.

Key skills in the curriculum

The development of the senior cycle *Key Skills Framework* was based on the premise that students will encounter the key skills frequently and in an integrated way in many areas of the curriculum. They will be developed through the learning outcomes of each subject, short course and transition unit. Students will not take separate courses or units in key skills; rather they will encounter the skills through their chosen programme of study.

The subject review and development currently underway is underpinned by writing syllabuses in learning outcomes, syllabus updating, and changes to assessment. A feature of the extensive changes in curriculum and assessment is that the key skills will be integrated explicitly in the curriculum and that they will be visible in the syllabus through a statement of key skills and in the learning outcomes. They should also be visible in the assessment, both in the assessment for learning throughout the course and in the summative assessment components used for certification.

The embedding of key skills will provide a better balance between knowledge and skills in the educational experience of students and will promote effective learning, providing learners with the competencies to learn how to learn. A more deliberate fostering of these skills will also contribute to a changing school culture where greater attention to the teaching and learning process will result over time in learners taking more responsibility for their learning with schools facilitating a wider range of learning experiences, opportunities and environments.

Working with schools

In order to ensure that the work on embedding of key skills in senior cycle is well ground-

ed in classroom practice, NCCA has engaged in an action research project with a network of fifteen schools. The research sought to provide a climate of opportunity for reflection, critique and reframing of practice in key skills teaching and learning. The intention was to build a relationship of trust such that teachers would feel supported in reflecting critically on their practice and developing new insights as to how to teach in a way that would support the embedding of the five key skills. In addition, the research enabled students to have a 'voice' in curriculum development through their reflection on learning in the different subject areas.

Action research, as described by Jean McNiff, was deemed the most suitable methodology to facilitate this kind of enquiry into practice.
Action research is a concept which refers to a process of people taking action on a problematic situation, thinking about what they are doing, deciding that they might do it a better way, trying it out, reflecting on that action, and continuing with what they feel is now better practice, but always aware that they will need to update their thinking and modify their practice as the situation requires. (McNiff et al 2001)

This methodology was used in order to put teachers and students at the centre of the process and to get evidence on the embedding of key skills that would be used to inform curriculum review and development. At the outset of the project there was not a clear set of indicators as to what embedded key skills would 'look like' in practice. In their reflections, teachers arrived at what they believed worked based on improved student attention, attainment in and enjoyment of their subjects. Teachers' own attitudes to students and to their subject and practitioner knowledge contributed to the overall picture of 'what works'. Students' reflections on their learning informed teacher's judgement and provided another perspective on the learning experience. There was video evidence for some classes which added to the overall picture of 'what worked' for some teachers in some classes.

To facilitate the data gathering process, tools were designed by the project team in consultation with the teachers involved. The purpose of the tools was to provide teachers with support to encourage the process of reflection and to facilitate teachers and students in preparing their accounts of practice. The accounts of practice were sent to the researchers for feedback. The tools[3] used were

- end of class reflection sheet
- end of topic reflection sheet
- meeting with colleague reflection sheet
- class planning reflection sheet
- student end of class reflection sheet.

All the data gathered was read and analysed by the research team to identify themes or issues that emerged. To ensure that the data analysis was authentic and true to the voices

[3] Available to download at www.ncca.ie/seniorcycle

it represented, teachers were asked to read the analysis and give their feedback on the themes that emerged. In addition, it was possible with the teacher description of the class and their reflections, their students' reflections and in some cases video evidence to triangulate to some degree of accuracy a 'picture' of the teaching and learning in the class. Data was gathered in the form of the reflection sheets, emails and notes from group seminars.

Teachers quickly came to recognise that the embedding of key skills is intrinsically linked to methodology and to effectively develop the key skills requires less whole class teaching and more active learning methodologies. They talked about how they were *surprised how key skills appeared when structure and methodology is changed* (Biology teacher reflection). They reported that when key skills were the focus of planning for teaching that the class was more learner-centred and less content-centred. At the start of the project many of the teachers spoke of 'teaching for the exam', and felt that their aim was to 'cover' the content. A 'banking' model of teaching was evident as teachers spoke with regret about having to fill the student's heads with notes that could be regurgitated in an exam and 'spoon-feed' information that would guarantee their success in the 'Leaving Certificate'. The students were largely passive recipients in this process and the object of the act of teaching. Changing this was difficult and not always successful as observed by one teacher *many students still expect to sit back and just absorb information from the teacher without any real effort on their part* (Biology teacher reflection).The subject of instruction (Mathematics, Biology, French, etc) was most prominent in planning for teaching. The introduction of a key skills focus changed this as teachers quickly began to shift the focus from what they needed to teach to who they wanted to teach, and how they wanted to teach, *I became aware not only of the content of my classes but also of the students as learners with a diversity of learning needs* (Spanish teacher reflection).

Teachers reported that they began to use more group work, pair-work, class discussion, peer-teaching and peer-assessment. The students had to take more responsibility for their learning. Teachers found that if you wanted students to be more personally effective and to think critically and creatively then they needed to interact with the material being taught and develop their own notes rather than be given handouts, discuss themes and character in English rather than take teachers interpretation, plan investigations in the science subjects rather than follow a recipe. The learners responded positively to this shift in power in the classroom. Many reported that *I definitely prefer being taught this way because you are more inclined to think through what you are doing and make sure you understand it fully* (Maths student reflection) and, *you understand and it is not just notes in a hardback* (Biology student reflection).

Traditionally in Ireland teacher professional development is subject based and 'delivered' by a 'subject expert', based on a transmission model of continuous professional development. This project was different in that it brought together a group of teachers from different disciplines and was focused on teaching and learning and not on subject content. The group seminars afforded teachers an opportunity to develop their skills around pedagogy and encouraged cross fertilization of ideas across different disciplines. Teachers

reported that *I now see how I've developed patterns and habits of teaching over the years. We all do that and we assume they work! It's great to get a chance to share new ideas and learn from other teachers from other subject areas* (group seminar reflection). As teachers used the skills of working with their colleagues and reflecting on their practice using a variety of sources of information, they observed that the embedding of the skills in their teaching became more habitual and less of an effort.

In an effort to get students to think critically and creatively, teachers moved from handing out notes, using the overhead and 'chalk and talk' to asking students to source information from a variety of sources. It was obvious that students did not possess the basic skill of note taking and needed practice, initially students wrote far too much. They reported that *in the past I was taking down too much information and not just the necessary. With the help of my teacher I now know the right amount of information to write down* (Biology student reflection). They also needed practice in looking up information from newspapers, magazines and the internet and even practice in using a dictionary. However, after a relatively short time learners became adept at note taking and researching information. They preferred their own notes and reported that teacher's *notes can just pile up and get confusing* (English student reflection).

Typically learners worked with little teacher intervention making sense of the information and recorded the key points, then, in pairs or groups they explained their thinking and listened to other people's points. In this way they were getting three opportunities to interact with the information. Teachers found that this method was an excellent way to differentiate learning, with the more able students being able to extend themselves and less able having the key points reinforced for them in a number of ways. Interestingly students liked working in groups on their notes and honing down their work into key points.

What initially looked like a preference for group work, on further analysis it was apparent that it was the time to process the information and to engage with the information that motivated these students. *I liked working in a group because you can help each other when you get stuck. You can also get many different ideas* (French student reflection).

It was clear that learners were motivated to do well in the examinations and felt that taking more responsibility for their learning gave them a better understanding of the content. A student of French commented *I like being able to research my topic and present it in a way I liked most. I found when I researched a topic myself, I learned it better. The research clarified many questions I had. Another student explained that by making my own notes I feel I could do it better and know what information in the chapters would be the best to remember* (English student reflection).

Learners used different methods of note taking, quite a few used mind mapping. What teachers and learners agree is that 'being given' a mind map does not work, what does work is the student getting the information and developing an understanding of it then

creating their own mind map. One teacher commented that *mind maps and diagrams are helpful for the weaker pupil as it gives them a defined structure to hang the learning, however, working on their own is important as pace cannot be determined by anyone but themselves* (Biology teacher reflection). Some students found drawing diagrams a help *I got information from books, school, internet, charts, etc. We collected our information, broke it down to our understanding in a way it would stay in our heads, for example diagrams (labelled), bullet points of important information* (French student reflection).

One teacher concluded that *student's seemed to appreciate the different ways I tried to present information to them e.g. using PowerPoint/newspaper articles and they also had to do an activity where they decoded DNA into a protein. It definitely makes me want to move away from the traditional 'notes' based method of teaching because I was getting positive feedback and although it meant the class were talking more it was mostly about the topic being taught* (Biology teacher reflection).

The first phase of the project has promoted and encouraged active sharing of ideas for teaching and learning among teachers. It has stimulated innovative approaches by teachers in their teaching and as a consequence it has promoted more engaged forms of learning among students. It has facilitated students in becoming more effective, reflective and autonomous learners. It has affirmed the value of a key skills approach to teaching and identified practical ideas and methodologies that enable the key skills to be embedded within the curriculum. Engagement with the key skills has reconfigured the way teachers see curriculum. Instead of seeing it as content, textbook and assessment they now see it as the experienced curriculum by the learners in the classroom.

While the focus of the project has been on the embedding of the key skills in the curriculum as experienced in the classroom, it is also acknowledged that the reflective practice approach used and the professional development provided were factors in the benefits derived from the work. This will form an important part of the learning from the project and will inform advice on continuous professional development for teachers.

The project provided policy makers with evidence on

- Are the five key skills relevant to all subjects?
- Does the embedding of key skills support effective learning?
- How does the curriculum need to change to support the embedding of the five key skills?
- How does assessment need to change?
- What needs to happen to implement key skills in second level education in Ireland?

The five key findings that are emerging to date can be summarised as follows

- the five key skills are relevant to each subject, all skills can be developed to different extents deepening how the material is taught
- teachers claim that when key skills are the focus in planning for teaching then teaching becomes more learner-centred

- for teachers to be successful in embedding the key skills, they needed to be given opportunities to develop their own understanding and practice of the key skills
- the successful embedding of key skills requires curriculum and assessment change. The key skills must be reflected in the learning outcomes and in the methodologies and approaches that are promoted in the syllabus documents
- teachers and students claim that a key skills approach to teaching contributes to effective learning and greater engagement and enjoyment in learning.

For key skills to really make a difference to the learning experience of students the following challenges have to be addressed

- it takes time to change mindsets and convince teachers and students of the value of this approach to teaching and learning. The approach would be supported if key skills were also embedded at lower secondary education
- the amount and type of content in syllabuses needs to change to facilitate the development of key skills and to improve effective learning
- methods of assessment and the range of assessment instruments need to be developed to support the type of learning that is encouraged through key skills
- additional time is needed for planning, for teaching and for reflection on teaching
- professional development that includes a mix of theory and an understanding of practice is necessary to encourage a shift in teaching and learning.

Conclusion

Findings from the Key Skills Project will support curriculum and assessment development by contributing information to a number of key questions. An interim report (NCCA, 2008) on the first phase of the project begins to answer these questions. It will also serve to inform the design of the next phase to ensure that a more comprehensive picture of the impact of key skills on teaching and learning across a range of subjects is formed. Meanwhile, work is continuing on the embedding of the key skills into the learning outcomes of subjects as they are being reviewed and developed. The final phase of the project will inform advice on successful implementation and teacher professional development to ensure that the embedding of the key skills makes a significant impact on the experience of the young person in the senior cycle classroom.

References

Moseley, M., Eilliott, J., Gregson, M., Higgins, S. (2005). *Thinking Skills Frameworks for Use in Education and Training.* British Educational Research Journal, Issue 3, pages 367-390

NCCA, (2002). *Developing Senior Cycle Education: Consultative Paper on Issues and Options.* Dublin: NCCA

NCCA, (2003). *International Developments in Upper Secondary Education.* Dublin: NCCA.

NCCA. (2002). *Developing Senior Cycle Education: Consultative Paper on Issues and Options.* Dublin: NCCA.

NCCA. (2003). *Developing Senior Cycle Education: Directions for Development.* Dublin: NCCA.

NCCA. (2003). *Developing Senior Cycle Education: Report on the Consultative Process.* Dublin: NCCA.

NCCA. (2005). *Proposals for the Future Development of Senior Cycle Education in Ireland.* Dublin: NCCA.

NCCA, (2005). *Key Skills in Senior Cycle: Interim Report.* Dublin: NCCA

McNiff, J. (2002) *Action Research: Principles and Practice, Second Edition.* London, Routledge

Rychen, D.S. and Salganik L.H. (May, 2000), *Definition and Selection of competences: Theoretical and Conceptual Foundations (DeSeCo) Background Paper* Neuchâtel: DeSeCo Secretariat.

Whitby, K., Walker, M., O'Donnell, S. (2006) *International Review of Curriculum and Assessment Frameworks. Thematic Probe: the Teaching and Learning of Skills in Primary and Secondary Education.* http://www.inca.org.uk/pdf/Skills_probe_final_report.pdf

Appendix 1
Key skill elements

Key Skill	Elements
Information processing	• Accessing information from a range of sources • Selecting and discriminating between sources based on their reliability and suitability for purpose • Recording, organising, summarising and integrating information • Presenting information using a range of information and communication technologies
Critical and creative thinking	• Examining patterns and relationships, classifying and ordering information • Analysing and making good arguments, challenging assumptions • Hypothesising and making predictions, examining evidence and reaching conclusions • Identifying and analysing problems and decisions, exploring options and alternatives, solving problems and evaluating outcomes • Thinking imaginatively, actively seeking out new points of view, problems and/or solutions, being innovative and taking risks
Communicating	• Analysing and interpreting texts and other forms of communication • Expressing opinions, speculating, discussing, reasoning and engaging in debate and argument • Engaging in dialogue, listening attentively and eliciting opinions, views and emotions • Composing and performing in a variety of ways • Presenting using a variety of media
Working with others	• Working with others in a variety of contexts with different goals and purposes • Identifying, evaluating and achieving collective goals • Identifying responsibilities in a group and establishing practices associated with different roles in a group (e.g., leader, team member) • Developing good relationships with others and a sense of well-being in a group • Acknowledging individual differences, negotiating and resolving conflicts • Checking progress, reviewing the work of the group and personally reflecting on one's own contribution
Being personally effective	• Being able to appraise oneself, evaluate one's own performance, receive and respond to feedback • Identifying, evaluating and achieving personal goals, including developing and evaluating actions plans • Developing personal qualities that help in new and difficult situations, such as taking initiatives, being flexible and being able to persevere when difficulties arise • Becoming confident and being able to assert oneself as a person

The Integration of Transversal Competences in Classroom Instruction at Secondary Level I

— *Erich Svecnik*

Summary

This chapter sets out to analyse how the eight key competences defined in the European Reference Framework are embedded in the Austrian system of education at secondary level I. Substantive analysis clearly reveals that all key competences are covered, even though the curricula and other school regulations do not explicitly refer to the European Reference Framework. On the one hand, some individual key competences are assigned to subjects of instruction for which pupils are graded, while on the other hand transversal competences are explicitly mentioned in the General Part of the curricula and in the introductory sections of the subject curricula. The development and implementation of educational standards has introduced a degree of mandatoriness at system level, without direct consequences for the individual pupil or teacher, which is to promote the conveyance of key competences from the angle of sustainability. Concomitant supporting measures are of particular importance, as is shown in a case study on the integration of transversal competences in Mathematics instruction, where independent learning, working techniques, methodological skills, cooperation-based action, as well as critical thinking and reflection, are specifically fostered in teaching sequences that have been worked out in great detail. The way in which they are implemented allows overcoming widespread obstacles to the transmission of transversal competences.

Introduction

The European Reference Framework on key competences for Lifelong Learning was adopted in December 2006 with the recommendations of the European Parliament and the Council (Education Council, 2006). This document provides guidance to the Member States of the European Union on the further development of the national systems of education under the open method of coordination, all while respecting Articles 149 and 150 of the European Treaties. This means that while the goals and orientations remain common all over the European Union, the organisation and content of the educational systems remain the exclusive responsibility of the Member States. Key competences should per se be understood as transversal competences which every citizen needs, which are acquired during compulsory schooling, and which should be expanded, completed and updated through lifelong learning. These are a combination of skills, knowledge, aptitudes and attitudes. Compulsory schooling in Austria lasts for nine years and generally ends after the first year of upper secondary level. The primary level and lower secondary level such form the core period for developing key competences. Austria has recently seen a public debate on the role of pre-school education, especially with regard to (mother

tongue) language skills. This paper focuses on secondary level I, on the applicable curricula, and on recent developments aimed at ensuring key competences. Special attention will be given to transversal competences.

The National Context

The school system

In Austria, legislation governing the organisation and content of the educational systems is reserved to the federal level[1]. The types of schools and their educational objectives are governed by school laws[2] adopted at federal level; the curricula are issued by the competent member of the government by way of ordinance. By and large, the school system is centrally organised, with some decentralised elements. Schools, for instance, enjoy leeway to set individual priorities autonomously by pooling or rearranging subjects of teaching, or by shifting the number of hours allocated to the different subjects within defined limits. Moreover, the curricula provide syllabi that do not prescribe a precise number of hours, but ranges with an upper and lower limit. The curriculum for German, for instance, sets out a minimum of 15 and a maximum of 21 weekly hours for the four years of lower secondary level. A "default" syllabus is in place for schools that have not developed their own syllabi under school autonomy.

Austria runs two types of schools at lower secondary level which differ primarily in their educational objectives. Secondary general school (*"Hauptschule"*) is to "convey a basic general education and to qualify pupils, depending on their interests, talents, abilities and skills, for working life or a transfer to the intermediate and upper levels"[3]. Secondary academic school (*"Allgemein bildende höhere Schule, AHS"*) with its two branches of *"Gymnasium"* (humanities-oriented) and *"Realgymnasium"* (science-oriented) is the academic route and designed to "convey a comprehensive and in-depth general education to pupils and to qualify them for enrolment at university"[4]. The curricula for both school types are worded largely identically and differ, with the exception of their educational mandate, only in individual subjects (e.g. Latin only in the humanities-oriented branch). After completing secondary level I, leavers of both school types may either transfer to the pre-vocational year (*"Polytechnische Schule"*), or – depending on their educational attainments – to a wealth of technical and vocational schools at various levels, as well as to the upper level of academic secondary school.

[1] Federal Constitutional Act, Art. 14
[2] School Organisation Act ("Schulorganisationsgesetz" SchOG) and School Education Act ("Schulunterrichtsgesetz" SchUG)
[3] Section 15 subsection 1, School Organisation Act
[4] Section 34 subsection 1, School Organisation Act

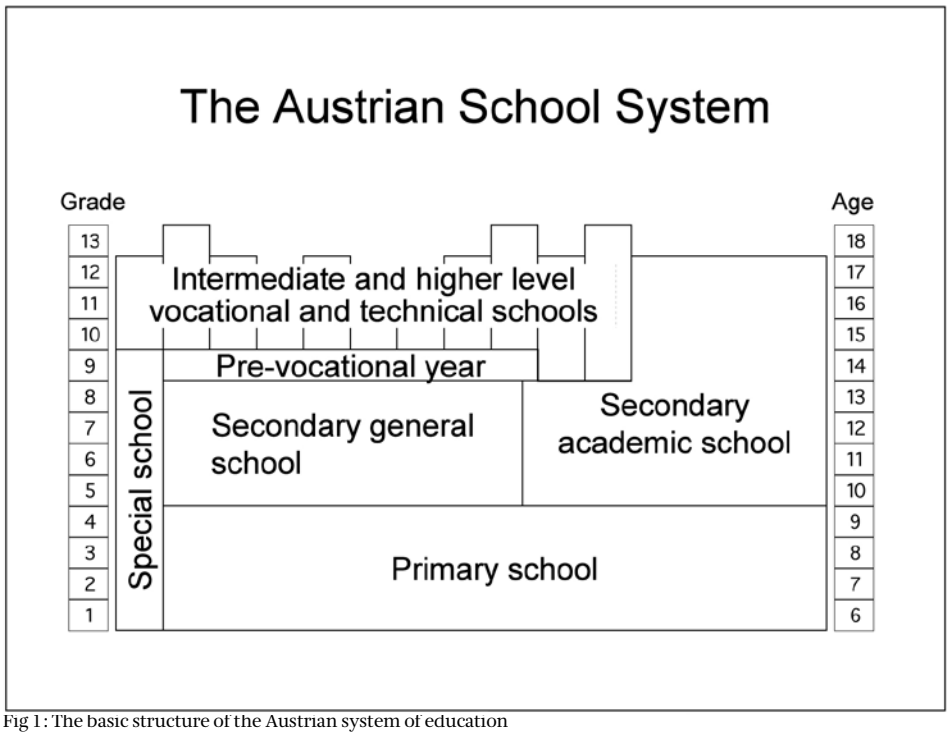


Fig 1: The basic structure of the Austrian system of education

Teachers are responsible for performance assessment. An ordinance on performance assessment issued by the competent ministry provides the general framework and lays down the frequency and extent of school tests and examinations as well as any other achievements that should (or should not) be considered when assessing a pupil's performance. The ordinance also prescribes assessment on a scale from 1 to 5. Austria does not have a system of central tests that would affect the individual assessment of performance. In legal terms, the annual reports qualify as official notices, and negative assessments may be challenged by filing a complaint with the relevant boards of education (district or province school inspectorate).
In substantive terms, school laws contain what is called an "objectives paragraph"[5] which spells out the mandate of Austrian schools and refers to the overall objective of lifelong learning by prescribing that young learners should be educated for self-driven learning.

Curricular structure and contents

All Austrian curricula consist of a General Part and the Subject Curricula for the individual subjects of teaching. The General Part sets out the general objectives of education, the general didactic principles, indications on school and instruction planning, and the syl-

[5] Section 2, School Organisation Act

labi. The General Part covers in particular those areas that cannot be assigned to specific subjects, but should be considered in all subjects to an equal extent. The General Part of the curricula also outlines how the key competences are broken down in Austria (into subject-matter competence, self-competence and social competence). These three competences are the underlying foundation that is further differentiated by educational fields and then by subjects of instruction (Svecnik, 2004). The curricula do not explicitly refer to the European Reference Framework.

Self-competence covers "the development of one's own talents and aptitudes, but also knowing about one's own strengths and weaknesses, as well as a readiness to discover and try oneself continuously in new settings".

Social competence describes "the ability and readiness to assume responsibility, to cooperate with others, develop initiative and contribute to shaping social life at school and in the surrounding world". Self-competence and social competence together are called **dynamic skills**, because they are to prepare pupils for coping with situations in which accumulated knowledge and acquired experience alone do not suffice, but where they must find a solution in response to a given context.

Subject-matter competence finally covers the entirety of all subject-related competences that where acquired by independent and active learning and critical review. It covers five educational fields to which some 15 subjects of instruction are to contribute, depending on the school type, and which are set out explicitly in the subject curricula. By grouping the subjects into educational fields, not only subject-matter know-how but also genuine content-driven competences are developed through interdisciplinary and cross-curricular educational offers. The five educational fields are Language and Communication, The Individual and Society, Nature and Technology, Creativity and Design, as well as Health and Exercise. The curriculum distinguishes between core contents and extended contents. Two thirds of the weekly number of hours laid down in the default syllabus must be allocated to the core contents. Apart from this limitation by the amount of allocated time, core contents are also defined in the subject curricula. The extended contents on the other hand must be defined either by the teachers themselves, or by means of school-autonomous provisions.

The curricula do not only define the skills, knowledge, aptitudes and attitudes that should be conveyed and which in their totality make up the notion of competence (Weinert, 2001), but also provide guidance on how to reach this aim. Since the Austrian system of education gives near-total discretion to teachers in the choice of methods they use, the curriculum does not contain clear-cut prescriptions but general practical instructions as to how teachers should design classroom instruction autonomously. In order to foster the development of competences, teaching should be varied and employ a variety of different methodologies, focusing in particular on interdisciplinary and cross-curricular educational offers consistent with the educational fields, on linking up knowledge and experiences previously acquired, and on pupils' self-reliance and independence. As schools

open up towards their local and regional environments, and as classroom activities are being complemented by school events such as outings, pupils will be enabled to connect with the surrounding world and, above all, to develop competences. The dynamic skills are to be included in the assessment and evaluation of performance and promoted by transparent requirements and feedback on the level of performance attained.

Interdisciplinary and cross-curricular
Link up knowledge and experiences previously acquired
Self-reliance and independence
Consolidation of teaching results and feedback
Connect with the surrounding world
Differentiation and individualisation
Opening of schools
Intercultural learning

Fig 2: Guidance on how to design instruction for the transmission of competences

The European Reference Framework and Austria's Curricula

Subject-matter competence

The European Reference Framework covers eight key competences, half of which are subject-matter competences and the other half are transversal competences. The subject-matter competences include mother-tongue communication, communication in foreign languages, mathematical competence and basic scientific and technological competences, as well as digital competence. *Grosso modo*, they can be assigned to the different subjects taught in Austrian schools. Mother-tongue communication is transmitted in German, foreign-language competence in the Modern Foreign Languages (mostly English), mathematical competence and basic scientific and technological competences in Mathematics, Physics, Chemistry, partly in Biology and Environmental Studies, Handicraft, but also in Geography and Business Studies. Only digital competence cannot be assigned to a specific subject. The curricula for lower secondary level consider this a cross-curricular competence to be fostered and developed equally on a mandatory basis in all subjects of instruction as defined in the general educational objective that is spelled out in the curricula.

Digital competence
Classroom instruction is to take account of the ever-faster advance of modern information and communication technologies and of the mass media in all walks of life, and to harness the didactic potential of IT whilst allowing for a critical and rational debate of its mode of functioning in business and society.
Pupils should be enabled to make relevant experiences in consideration of the available technical resources and offered appropriate methods for a well-targeted selection of computer-based information and knowledge sources.

Fig 3: Instructions on digital competence in the General Part of the Curriculum

Moreover, the subject curriculum for Mathematics contains explicit rules on the use of IT. Many schools, however, have used the leeway granted to them under school autonomy to make IT a special priority, together with more in-depth IT instruction, which is sometimes taught as a separate subject.

Transversal competences

It is only natural that the four transversal competences of the European Reference Framework cannot be assigned to individual subjects of instruction. This is why they are first and foremost defined in the different sections of the General Part of the curriculum. The subject curricula, however, refer at several instances to how the individual subjects should contribute to fostering transversal competences (Svecnik, 2001). The following chapter will deal with the four transversal competences from the angle of the General Part of the curricula. As they do not explicitly refer to the European Reference Framework, content analysis is to reveal to what extent these competences are implemented in the current curricula of lower secondary level, whereby only explicit references were taken into account. In addition, we find many wordings leaving a wide scope of interpretation that would allow assigning them to a subject. However, in the interest of clarity and maximum objectivity, they have not been included in this analysis. Fig. 4 shows that the General Part of the curricula addresses all four transversal key competences. It is striking to note that social and civic competence is referred to in considerably more educational fields than the other key competences. Assuming - for the purpose of a quantifying content analysis - that the frequency of reference is an indicator for relevance, social and civil competence seems to enjoy special weight in the curricula.

	Learning to learn	Social and civic competences	Sense of initiative and entrepreneurship	Cultural awareness and expression
General educational objective		•	•	
Competences	•	•	•	
Educational field Language and communication				
Educational field The individual and society		•		
Educational field Science and technology				
Educational field Creativity and design		•		•
Educational field Health and exercise		•		

Fig. 4: Overview of how the transversal key competences of the European Reference Framework are embedded in Austria's curricula for secondary level I

Learning to learn

Learning-to-learn can be found in the General Part of the curricula, especially from the angle of independent acquisition of knowledge (cf. Fig. 5). Emphasis on the lifelong learning dimension suggests that the process of learning does not end once pupils leave school and that school must lay the foundations for participation in education at a later stage in life. Concurrently, we find a reference that learning is a process in which pupils should be actively involved. The curricula explicitly provide that pupils should acquire learning techniques that empower them to unfold learning activities independently. Beyond such

guidance in the General Part, the subject curricula, too, contain clear references at several instances on the role of learning to learn as a meta-competence that overarches subject-matter competences, such as a reference in the curriculum for Mathematics demanding that *"Pupils should repeat lines of thought that have led to the acquisition of mathematical know-how and, in doing so, learn to reconstruct, present independently, and corroborate knowledge they have acquired."*

Learning to learn
It is a focal task of school to transmit in-depth knowledge by empowering and encouraging pupils to independently and actively acquire but also to critically reflect and analyse available knowledge with a view to life-long learning.
Pupils must learn to understand learning as a process. They should know the demands placed on them, learn to assess themselves and, in doing so, derive motivation for their work.
The conveyance of learning techniques is an indispensable requirement for self-reliant development of knowledge and skills while at the same time serving to create a basis for life-long and self-reliant appropriation of education.

Fig 5: References to learning-to-learn in the General Part of the curricula

Social and civic competences

As already shown in the comparative overviews (Fig. 4), social and civic competences enjoy special attention in the curricula. There is no single subject of instruction, but the significance of this competence is illustrated by the fact that an entire educational field – "The Individual and Society" – is devoted to this theme. As can be gathered from Fig. 6, it embraces values such as tolerance, plurality and democracy, which should be upheld and further developed in instruction. At the same time, constructive participation in society is being called for at multiple instances as a goal of classroom instruction. In several passages, the curricula speak of assuming responsibility at different levels, in interpersonal contexts, at school, the surrounding environment, and in society. As an entire educational field is assigned to this key competence, it follows that each individual subject curriculum lists what each individual subject of instruction should contribute. All subject curricula therefore contain references to social and civic competences.

Social and civic competences
The ability and readiness to assume responsibility, to cooperate, to take initiative and to participate in shaping social life at school and in external settings.
It is important that pupils learn to deal with factual themes, with themselves and with others, in a manner that is constructive for all those involved.
The dignity, freedom and integrity of each individual, the equality of all humans, men and women, as well as solidarity with the disadvantaged and the marginalised are key values and educational objectives of school education.
Pupils should be guided to responsible behaviour and interaction, in particular in the areas of gender, sexuality and partnership. They should learn to recognize and critically question the origins and impacts of the role models attributed to the sexes.
Pupils should be made aware of how closely the individual interacts with various forms of community; self-esteem and esteem of others as well as respect of the different human pathways to a meaningful life should be promoted.
Pupils should be made aware that social phenomena have historic roots and are created by humankind and that it is possible and meaningful to proactively influence social developments.
Pupils should be made familiar with the mandate and functioning of social institutions and lobbies, and work out, and critically reflect on, possible solutions for conflicts of interest.
Classroom instruction should actively contribute to a democracy that subscribes to human rights.

Classroom instruction should promote a critical attitude, as well as decision-making and action competences, as they are crucial for the stability of pluralistic and democratic societies.
Pupils should learn to embrace an openness vis-à-vis the world in an ever more international society that is carried by an understanding of the existential problems of humanity and shared responsibility.
Values such as humanitarianism, solidarity, tolerance, peace, justice, equality and environmental awareness should guide our actions.
Creative and constructive work should be experienced on a continuum from self-realization to social responsibility as an individually enriching and community building activity.
Pupils should be supported to develop a health-conscious lifestyle that is considerate vis-à-vis the surrounding environment and others.

Fig 6: References to social and civic competences in the General Part of the curricula

Sense of initiative and entrepreneurship

A key element of modern, complex societies requires individuals to develop a sense of entrepreneurship without actually being entrepreneurs in the economic sense. Coping with one's own life requires self-judgement and a sense of initiative – a proactive spirit. In the workplace, as well, a sense of initiative and entrepreneurship are on the order of the day. In the Austrian curricula, a sense of initiative and entrepreneurship are closely associated with the dynamic skill of self-competence and thus defined in a generic sense. As can be gathered from Fig.7, the General Part contains very few specific statements.

Sense of initiative and entrepreneurship
Develop one's own talents and aptitudes, but also knowing about one's own strengths and weaknesses, as well as the readiness to repeatedly discover and test oneself in new settings.
Pupils should …… develop their own ideas about their career options.
They should be aware of the demands placed on them, learn to assess themselves and, in doing so, find motivation for their work.

Fig 7: References to a sense of initiative and entrepreneurship in the General Part of the curricula

Cultural awareness and expression

Cultural awareness and expression accommodate both a receptive and an active, creative component as well as requiring knowledge. Similar to social and civic competence, a separate educational field is assigned to cultural awareness, namely creativity and design. The statement *"Pupils must be given an opportunity to engage in creative experiences themselves and to combine affective with cognitive findings"* makes clear that this is a broader access to experiencing and shaping the world. On this basis, all subject curricula list the relevant contributions that refer in particular to creativity, but also to concrete knowledge. History and Social Studies, for instance, impart knowledge on cultural eras and achievements, languages contribute with literature and creative writing, etc. Moreover, this field is largely covered by subjects such as Art and Music Education, which convey fundamental knowledge, but more importantly promote the active creativity in pupils.

Standards to make core competences more specific

Traditionally, the Austrian system of education was input-driven, meaning that the allocation of resources (teachers, funding) and the rules and recommendations on the

contents and organisation of instruction (curricula, decrees, circulars) used to be the determining elements of system control. For some years now, we are seeing a reorientation towards output-driven control, not least in response to international developments, which increasingly relies on the outcomes of teaching in different forms as its underlying basis. On the one hand, the individual school sites are given greater autonomy as to the contents and the way they organise instruction, while also becoming accountable on the other hand.
One element in this process is the development and pilot testing of **educational standards**, which was launched in 2002, with implementation being scheduled for 2009. In a first phase, they are developed for German (mother tongue), English (first modern foreign language) and Mathematics, their gradual expansion to other subjects of instruction is already under way. The educational standards are to introduce a degree of mandatoriness without posing a threat to the individual schools in the form of a school ranking. By defining a core of fundamental competences, they are designed as a framework for independent development under school autonomy. The educational standards are neither an exhaustive description of the competences to be acquired, nor do they affect the extended contents of the curricula. By the same token, the standards do not interfere with the teacher's methodological freedom. While the standards do not directly affect classroom instruction as such, they have an indirect influence through feedback on results and supporting measures, which will be discussed in the following.

Sustainability is one important aspect: standards define in concrete terms which curricular competences pupils should have sustainably acquired, i.e. even after they have left school, and at defined transfer points in the system, namely after year 4 at the transition from primary to secondary level, and after year 8 at the transition from lower to upper secondary level. This sustainability aspect illustrates that the standards in fact come very close to the definition of the key competences in the European Reference Framework, viz. fundamental competences to be expected from each and every individual.
In general terms, all educational standards are based on an elaborate competence model on the basis of which two different assignments are developed with different objectives. The first type of assignments serves as a basis for national tests by which some 30% of all classes in years 4 and 8 will be covered in one subject starting in 2009. These tests are largely summative in nature, since their results will be used for evidence-based system control. Thanks to the feedback strategy, they also include formative aspects. This feedback strategy consists of giving the different levels only as much information as is necessary and useful for them. This means that every pupil receives his or her individual competence profile, while the teachers only receive the results for their classes. At a higher level, results are available in aggregate form only. The school authorities finally receive the data in anonymised format only.
In the interest of economical testing, the test items must be IRT-compatible. They must therefore be designed in a simple response format and be kept confidential. In parallel, public assignment pools are developed for classroom teaching. Their aim is to concretely illustrate the goals, to offer aids for teachers in designing competence-oriented instruction, and to demonstrate which competences are being verified in national tests. This

process is supported by in-service further education and training at the University Colleges of Teacher Education. These supporting measures have been found to be critical for the process of implementing the educational standards (Freudenthaler&Specht, 2006).

Case Study: Transversal Competences in Mathematics

The Mathematics standards are based on a three-dimensional competence model consisting of mathematical contents, mathematical actions, and complexity (Heugl&Peschek, 2007). The content dimension for lower secondary level covers those areas of Mathematics which - by common consensus - are considered important and, naturally, maps the core curricular contents. It is defined in purely mathematical terms and includes "Numbers and measures", "Variable functional dependencies", "Geometrical figures and bodies" and "Statistical representations and parameters". The action dimension consists of those activities which actually render mathematical contents effective and useful, viz:

- Description, modelling
- Calculating, operating
- Interpretation, and
- Reasoning, substantiating.

The degree of integration and reflection is captured in the third dimension, which ranges from the application of fundamental know-how and skills to correlation and the use of reflective knowledge and independent reflection. One single mathematical competence is made up of what is done (mathematical action), the means by which it is done (mathematical content) and the degree of integration. Fig. 8 depicts such a competence as a field in a three-dimensional system of coordinates. Both the assignments in the national standard tests and the assignments that are published as teaching aids figure in the system of coordinates. Every assignment is explicitly allocated to the action, content and complexity dimensions so that teachers can form an idea of the competence profiles of their pupils at any time.

In parallel to the implementation of the educational standards, the Federal Ministry of Education issues booklets (Alber et al., 2007) in order to provide guidance to teachers in conveying Mathematics competence in combination with transversal competences. These worksheets are to promote Mathematics competence by process-driven instruction integrating various study, work and social forms, the underlying idea being that Mathematics, which appears abstract to the pupils, becomes more concrete when they are allowed to discover, experiment and make decisions for themselves. At they same time, they are to control their own learning processes and monitor the progress they achieve.
The model therefore not only defines mathematical competences, but also four transversal competences (Federal Ministry of Education, Science and Culture, 2004) that are to be conveyed in Mathematics instruction:

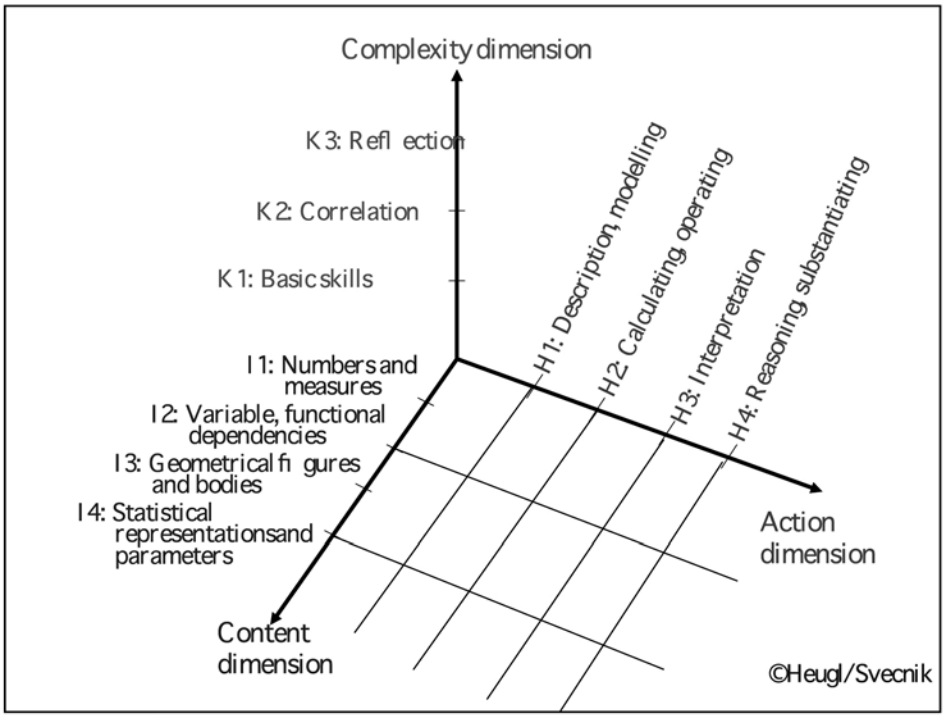


Fig. 8: The competence model for Mathematics for grade 8

- **Autonomous learning:** aptitudes and behaviours needed to plan and sustain the process of knowledge acquisition, to independently monitor progress, and to steer the process as appropriate. This includes efficient learning strategies as well as motivation, a firm conviction of the need of control, as well as a positive attitude vis-à-vis learning as such.
- **Work techniques, methodological competences:** Aptitudes and behaviours needed to collect, compare, select, analyse and process information in a manner that allows further transmission.
- **Cooperative action:** aptitudes and behaviours needed to work together with others in dealing with problems and solving conflicts constructively in this process.
- **Critical thinking and reflection:** aptitudes and behaviours concerning the independent questioning and assessment of statements and situations, and avoiding wrong conclusions based on insufficient information with a view to fostering resistance to manipulation.

In order to transmit these competences, the methodological worksheets contain "ready-for-use" teaching sequences as examples. They start out with individual assignments given to pupils in preparation for the subsequent activities, followed by partner and/or group work; special focus is placed on the presentation of what was acquired earlier and on learning with and from one another. These sequences contain all that is required, from preparatory material to copy-ready handouts, as well as detailed competence-oriented suggestions on how to assess whether the learning objective was achieved. Moreover,

they also contain competence indicators for pupils to assess their subject-related as well as their transversal competences in can-do statements (cf. Fig.9).

Autonomous learning:
I am able to repeat and to keep up with assignments on a regular basis.
I try to understand and not only to memorize the contents covered.
I try to find out how new contents fit in with what I already know.
I organise my work, and determine a sequence and a timetable.
I am able to acquire small portions on my own from my textbook.
When learning and doing my homework, I do not give up until I have understood the contents or at least have made up my mind about what I need to ask to be able to understand.
Work techniques, methodological competence:
I am able to retrieve information from books, magazines, encyclopaedias and other written material in a focused manner.
I am able to retrieve information from libraries and from the Internet in a focused manner.
I am able to select and structure what is important for me from the information found.
I am able to summarise the selected information in my own words.
I am able to generate a written summary using a word processing programme.
I am able to design a transparency or a poster.
I am able to present the results of my work to others.
I am able to speak freely when delivering a presentation.
Cooperative action:
I take on tasks within a group.
I am willing to take on responsibilities and duties in a group.
I help other members of the group.
I address problems that may arise in the group.
I am able to adequately defend my views in the group.
I deal with differences of opinion in a matter-of-fact manner.
I am willing to accept majority decisions against my own standpoint, unless they would curtail minority rights.
Critical thinking and reflection:
I collect information before forming an opinion.
I listen to the arguments of others.
I differentiate between views and facts.
I differentiate between rational and emotional reasons.
I take decisions on the basis of facts and arguments.
I take contrary opinions seriously and ponder about them.
I verify results as to whether they make sense.
I try to recapitulate all steps in detail when lines of thought or reasoning are put forward.
I always critically verify certain (e.g. statistical) information and statements.

Fig. 9: The can-do statements of transversal competences

These four transversal competences reflect the Austrian curricula, while at the same time being markedly close to the key competences of the European Reference Framework. The

didactic worksheets attribute considerable weight to partner and group work, not without recommending these cooperative forms of learning with a caveat. One recommendation consists of basing the learning process on an individual work phase. Problems of a disciplinary nature are bound to arise when pupils are confronted with alternative forms of teaching after traditional instruction where contents are developed through questions. Moreover, not every child may actually attain the required competences through team-based learning, because they take part in the learning activities to a different degree and thus benefit in different ways. It has therefore been recommended to prepare the pupils in several units for this new "independence".

This case study on integration in Mathematics instruction reveals possible solutions for overcoming widespread obstacles in the transmission of transversal competences:

- Given the fact that – as in the Austrian curricula – all subjects of instruction and teachers are mandated to transmit transversal competences there is a risk that, in the final analysis, nobody feels really responsible and that responsibilities become blurred ("diffusion of responsibility"). Mathematik[Methoden] (Mathematics[methods]) is an example where mathematical competences are supported by a transversal competence model, which defines responsibilities in Mathematics and clarifies the educational objectives to be attained, both for teachers and pupils.
- A fixed timetable with strictly scheduled units for the different subjects leaves sufficient leeway for interdisciplinary and cross-curricular instruction without requiring too much organisational effort. Mathematik[Methoden] provides guidance to teachers on integration in subject-matter instruction and therefore does not always require a break-up of mainstream teaching patterns when transmitting transversal competences.
- In Austria, as in other countries, teachers are trained and competent for given subjects of instruction. The detailed teaching sequences, the clear instructions and the didactic explanations, together with concomitant support and in-service further education and training, empower teachers to foster transversal competences in teaching. There is reason for hope that these examples and the support offered will encourage teachers to become creative in this area.

Conclusion

The legal provisions governing the Austrian system of education largely embed the key competences, even if they do not explicitly refer to the European Reference Framework. Recent developments such as the implementation and external review of educational standards at system level have created a new degree of mandatoriness in terms of greater competence orientation and even stronger integration of transversal competences. This reform is necessary as the demands young people will be facing in the future are not foreseeable, and as educational institutions would be overtaxed if new contents were simply added onto those already conveyed today.

In order to practically implement these changes in classroom instruction, teachers should benefit from well-dosed support which they actually accept and implement in their day-to-day work.

References

Alber, E.; Fischer, C; Juen, H. (2007). *Mathematik^{Methoden}. Beiträge zur Unterrichtsentwicklung mit dem Blick auf Bildungsstandards für Mathematik am Ende der 8. Schulstufe.* Vienna: Federal Ministry of Education, the Arts and Culture.

Federal Law Gazette II No. 133/2000. Ordinance: *Änderung der Verordnung über die Lehrpläne der allgemeinbildenden höheren Schulen.* (Amendment to the ordinance on the curricula for secondary higher general academic schools.) Vienna: 2000.

Federal Law Gazette II No. 134/2000. *Lehrpläne der Hauptschulen* (Curricula for Secondary General Schools). Vienna: 2000.

Education Council (2006). Recommendation of the European Parliament and the Council of 18 December 2006 on key competences for lifelong learning. Brussels: Official Journal of the European Union.

Federal Ministry of Education, Science and Culture (2004). Bildungsstandards für Mathematik am Ende der 8. Schulstufe. Version 3.0. Wien.

Freudenthaler, H.-H. & Specht, W. (2006). *Bildungsstandards: Der Implementationsprozess aus der Sicht der Praxis. Ergebnisse einer Fragebogen-Studie nach dem ersten Jahr der Pilotphase II.* ZSE-Report No. 71. Vienna, Klagenfurt, Graz: Zentrum für Schulentwicklung.

Heugl, H. & Peschek, W. (2007). *Standards für die mathematischen Fähigkeiten österreichischer Schülerinnen und Schüler am Ende der 8. Schulstufe.* Klagenfurt: Institut für Didaktik der Mathematik

Svecnik, E. (2001). *Der Stellenwert überfachlicher Kompetenzen in österreichischen Lehrplänen der Sekundarstufe II. Lehrplananalysen als Beitrag zur Klärung der Begrifflichkeiten.* ZSE-Report No. 54. Vienna, Klagenfurt, Graz: Zentrum für Schulentwicklung.

Svecnik, E. (2003). *Schlüsselkompetenzen als internationaler pädagogischer Leitbegriff. Erziehung und Unterricht,* Vol. 153, No. 5-6/03 [No 5-6, 2003], pp 578-584.

Svecnik, E. (2003). A triad of competencies general education at the secondary level in Austria. In: Letschert, J. (Ed.): The integrated person. Enschede: CIDREE.

Weinert, F.E. (2001). Concept of Competence: A Conceptual Clarification. In: Rychen, D. S. & Salganik, L. H. (Eds.) *Defining and Selecting key competencies.* Göttingen: Hogrefe & Huber Publishers.

Hurdles to be taken in developing digital abilities in Flanders.

— *Karl Desloovere*

Introduction

Given the Flemish cross-curricular final objectives Information and Communication Technology (ICT), if we are to know how future generations will participate in public life, as well as how they might fuel an innovative economy as citizens of a digital society, we need to understand the consequences of the diverse curricula. Government, school, teachers and pupils have to join forces so that the pupils will attain the necessary digital literacy.

"As globalisation continues to confront the European Union with new challenges, each citizen will need a wide range of key competences to adapt flexibly to a rapidly changing and highly interconnected world." (Commission of the European Communities, 2006)

One of the necessary capacities the future inhabitants of the European Community will need to master if they want to cope in this "rapidly changing and highly interconnected world" is the digital competence. Therefore, each member state has to prepare its educational system to achieve this goal.

The Belgian Constitution provides that everyone has a right to education, thus respecting the fundamental rights and freedoms of each individual. In order to guarantee this right for all children, Belgian has compulsory education. Compulsory education starts on the first of September of the year in which a child reaches the age of 6, and lasts 12 school years.

The Flemish authorities have chosen to consider ICT as a cross-curricular theme and as a result of this choice they have formulated cross-curricular final objectives[1].

Short history of the development of the Flemish cross-curricular final objectives ICT.

European digital kick off : economically coloured

During the March 2000 European Council in Lisbon, EU government leaders stated that Europe was faced with major challenges in adjusting to globalisation and the changeover to a knowledge-based economy. They stressed the need to 'provide each citizen with the competences necessary to live and work in the new information society,' and 'adopt a European framework to define the new basic competences which lifelong learning must make it possible to acquire: information technologies, foreign languages, culture, entre-

[1] Cross-curricular final objectives refer to competences that do not belong to the content of one subject, but that can be taught, practised and applied in it, such as ICT. Schools are obliged to make efforts with regard to these final objectives, which means that they must try to realise them to the highest possible extent with their pupils.

preneurship and social competences'.
Meanwhile, the European Commission unveiled a strategic framework of wide-ranging policy guidelines: i2010 or the European information society of 2010. In the light of a review of the information society challenges and large-scale consultations with the stakeholders about earlier initiatives and instruments, the Commission recommended three priorities for the European information society and media policy:

- the creation of a Single European Information Space which promotes an open and competitive internal market for information society and media;
- stepping up innovation and investment in ICT research with particular emphasis on more and better employment;
- achieving an inclusive European Information Society that prioritises better public services and quality of life. The emphasis here is on the generalised learning of basic digital competences.

Against this background, the European Commission tabled a proposal on key competences for lifelong learning. The proposal defined 8 key competences, of which one referring to ICT competences. This is described as follows:
"Digital competence involves the confident and critical use of information society technology (IST) and thus basic competences in information and communication technology (ICT). It is underpinned by basic ICT competences: the use of computers to seek, assess, store, produce, present and exchange information and to communicate and share with cooperation networks over the Internet." (Commission of the European Communities, 2006)
According to the European Commission, the skills cover: the ability to seek, collect and process information and deploy it in a discerning and critical way, to assess its relevance and distinguish between real and virtual reality in line with the linkages. People have to be able to use tools to produce, present and understand intricate forms of information and gain access to Internet services, then to search for and use information. People also have to be able to deploy ICT as an aid to critical thinking, creativity and innovation.

The Flemish path : personal development and social participation

First the hardware

The Flemish Government launched its PC/KD action programme for the integration of the multimedia computer into the classroom in June 1998. Funds are made available to schools for the purchase of hardware (computers, modems, network infrastructure, etc.) and software and to cover the in-service training for teachers. In August 1998, all elementary schools in the Flemish Community were granted a subsidy. From this year on also secondary schools were subsidised. The ultimate objective was that all Flemish schools attained one computer per ten pupils, aged 10 – 18, by the year 2002. A number of hardware manufacturers and software suppliers support this action programme. Through their local dealers they grant discounts for schools purchasing hardware and/or software through the PC/KD programme. In the meantime the programme was extended to all levels of education.

A specific federal Telecom Act commissions Belgacom, the semi-official telecom operator, to offer schools a special tariff for Internet access. To meet this demand, Belgacom has defined the 'I-line' product. Schools can order a Belgacom I-line for a flat fee of 245 Euro (excl. VAT) annually, through the Education department.
The I-line is either a two-channel ISDN-line for Internet traffic only or an ADSL-line (since January 2002), at the school's disposal for 24 hours a day. Installation, communication and subscription costs are included, the cost of an Internet Service Provider is not.

Then the plan

The Belgian Government announced in 2005 its National Action Plan for Digital Inclusion, as an outcome of the UN-sponsored World Summit on the information society. The plan is broadly based on the digital divide issue, designed to develop instruments to close the digital divide. A number of initiatives are proposed in the light of three priorities: awareness-raising, providing access and training. The initiatives are due to be elaborated in conjunction with the regions and communities.
The Flemish Government policy agreement "Giving Confidence, Taking responsibility" focuses in particular on the flow of information and communication within Flemish society. The Government of Flanders is keen to create an ambitious action plan (Digital Action Plan Flanders) "to underpin the digitisation of communication in society, while helping to bridge the digital divide". The twofold purpose of the action plan is for the Government of Flanders to ensure that Flanders continues to be out in front with the European information society leaders and to close the gap, in particular on the basis of a target group approach. The promotion of a Flemish digital society is a cross-cutting issue that has to be championed government-wide, with all policy areas, including education and training, playing a key role.
Launched in 2005 by Minister Vandenbroucke the Strategic Literacy Plan is designed to facilitate a coordinated approach to low literacy skills in Flanders. Precisely because there is now such a premium on ICT skills, the plan includes initiatives to sharpen these aptitudes. Literacy is defined as basic competences that are important in society for processing information, hence ICT skills as well, in addition to language, numerical and social skills. The Government of Flanders announced in July 2005 its approval for the basic principles of the Literacy Plan.
ICT policy within the education system has undergone major changes over the years and the latest transformation is the focus on promoting ICT skills, knowledge and attitudes.

At last the educational objectives

The social context calls for a specific interpretation of ICT competence. The introduction of ICT competences by means of cross-curriculum final objectives (1 September 2007) provides an answer to this social demand, outlining what is expected from educational establishments on the ICT front. This does not lead to the standardisation of ICT activities in schools. It is up to the educational establishments to assign an ICT status consistent with the personal approach to what constitutes effective education, as provided for in the

school development plan and the educational project. The ICT integration process is not only the responsibility of the individual teacher but of the entire school team. A strategic and structured approach to ICT policy ensures a gradual and effective integration of ICT throughout basic education.
The education system also has to offer competences that enable learners to undertake specific tasks effectively on the basis of ICT in the future and outside educational establishments. This is underpinned by a number of intricate (meta-cognitive) skills and attitudes, such as developing a positive attitude towards ICT, being willing to use ICT for problem-solving, adopting a discerning and conscious position on ICT as a social phenomenon, etc. The gradual development of these high-order skills enables learners to reflect them in situations outside the formal learning context, i.e. they are prepared to be able to cope in a world that is increasingly inundated with ICT applications.

The cross-curriculum ICT-related final objectives developed for education are as follows:

1 Pupils have a positive attitude towards ICT and are willing to use ICT in support of their learning.
2 Pupils use ICT in a safe, sensible and appropriate way.
3 Pupils are able to practise independently in an ICT supported learning environment.
4 Pupils are able to learn independently in an ICT supported learning environment.
5 Pupils are able to use ICT to express their own ideas in a creative way.
6 Pupils can retrieve, process and save digital information by means of ICT.
7 Pupils are able to use ICT in presenting information to others.
8 Pupils are able to use ICT to communicate in a safe, sensible and appropriate way.
9 Pupils are able to make an adequate choice out of different ICT applications depending on the objective to be reached.
10 Pupils are willing to adjust their actions based on reflection upon the use of ICT by themselves or others.

A closer look at each objective.

An important factor taken for granted in the education policy of the last decade is the increased desire for good quality education. The Flemish Government felt compelled to bestow more attention upon the development of providing services that promote quality. Through the use of minimum targets for educational content, the Government wants to respond to the society's demand to guarantee that each pupil in Flanders can rely on this education providing the minimum level that society considers achievable and necessary. Simultaneously, it must be guaranteed that these standards remain the minimum, so that room is left for organising authorities, schools, teachers, and pupils to add their own objectives and accents to these minimum targets.
The fact that the ICT-related cross-curricular final objectives in Flanders are generally formulated has everything to do with these fundamental premises of the Flemish educational system. Let us take a closer look at each objective.

Pupils have a positive attitude towards ICT and are willing to use ICT in support of their learning.
In the learning environment, ICT has to compensate for skills and attitudes that are not acquired spontaneously or even less at home. This is why the positive attitude is complemented with a willingness to use ICT as a teaching aid.

Pupils use ICT in a safe, sensible and appropriate way.
This involves a wide range of competences and attitudes, such as working in a rigorous and careful way, taking care of equipment and software, vigilance about harmful or discriminatory content and reporting this to a teacher, supervisor, competent department, where necessary, being aware of viruses, spam, pop-ups, ... and recognising unusual and unreliable messages, dealing cautiously with personal or confidential information, rejecting any abuse of ICT resources (such as harassing other people, bullying, sending unethical messages....., working ergonomically with a computer, using ICT solely where meaningful (for example, making a realistic assessment of the time the ICT is used and monitoring this), respecting intellectual property when using information and software and taking account of the financial and ecological dimension of the use of ICT.

Pupils are able to practise independently in an ICT supported learning environment.
Once a new learning content has been acquired, there have to be sufficient opportunities to exercise and the computer may be a useful tool under this heading. Examples are the widespread exercise programs for elementary maths. The added advantage of this type of ICT integration may take various forms such as: variation (in the types of exercises, catering for various learning styles ...), differentiation (in terms of the pace and level), customized feedback, saving time during the assessment.

Pupils are able to learn independently in an ICT supported learning environment.
Unassisted learning means pupils may acquire and process new learning contents with so to speak the computer taking over the role of the teacher. An example of this is the 'Webquest' method where the pupil is gradually led towards sites where information is available and where he or she has to process this information on the basis of goal-oriented tasks. Pupils may also carry out a simulation, for example, in the light of an appropriate educational programme and draw conclusions from this. An increasing number of secondary education establishments use open learning centres to teach pupils to work unassisted. Suitable programmes are also available for pupils with low cognitive abilities, next to all kinds of distance learning, supervised or otherwise.

Pupils are able to use ICT to express their own ideas in a creative way.
ICT may facilitate the creative process, so that learners can adopt a creative approach to dealing with images, words and sound, e.g. producing an attractive poster with words and images, illustrating an improvised text, making an electronic 'collage', the use of digital photography, making film clips and the use of drawing software for designing buildings. Learners may avail themselves of the basic capabilities offered by all kinds of text, image and drawing programs. Pupils who are good at coming up with ideas but are less good at

drawing can rely on ICT to provide them with further opportunities for realising their ideas.
Attempts to develop the visual faculty in education are seen to be almost non-existent, although sufficient facilities are available. In spite of the huge amount of visual material children and young people have to process every day, the ability to look is often intuitive and superficial. As for the reason to use these audiovisual aids; documentaries, films, news, picture recordings, soaps and video clips are mainly used to illustrate lessons, to motivate pupils to analyse what the lessons contain. In the case of animation films, the relaxation factor is important as well as the need to catch the children's attention, as in pre-school education, for example. When visual material is used, the idea is mainly to underpin the lessons, so its function is purely instrumental. Visual material is rarely considered as a teaching aid in its own right, in the light of media education, for example, as underscored in the IAK/Canon research into audiovisual training in Flemish education (Goegebuer, 2004).
On the basis of the final objectives, there nonetheless has to be a focus on being able to interact with image and sound. A new competence has to be created within the context of ICT competences.

Pupils can retrieve, process and save digital information (that is appropriate for them,) by means of ICT.
Searching for information partly involves the "electronic libraries" available on CD-ROMs, servers or the Internet, e.g. electronic encyclopaedias, DVDs, bilingual dictionaries, databases, educational CD-ROMs with text, image, sound, animation and, of course, web pages. Pupils will find the part intended for them in the actual library more appealing and teachers can define a "platform" here with information intended for or specifically targeted upon them. Teachers may also allow their pupils to work with search engines especially developed for educational purposes.
Information processing involves various activities such as establishing what is interesting in the context of their goal or tasks, using the information to find solutions for a request or a task, arranging this information so it can be presented to others, representing the information in other forms, such as an informative text, a dialogue, a diagram, a model, a presentation, a poster ...
The digital information concept needs to be broadly interpreted so it also covers the conversion of information into an electronic form, such as the scanning of photographs or newspaper articles.
In terms of content, the scope of this final objective is restricted by the context of the learning content for the relevant level, in terms of difficulty by the final objectives/ developmental objectives defining these contexts. For example, in the case of information processing, the restrictions the final objectives / developmental objectives set for interpretation in primary education also apply to the processing level, distance level and the types of texts. In the first level, the final objectives no longer restrict the texts used as "intended for them". This means that this final objective also implies that learners gradually learn to use criteria to assess a digital source in the light of its content-related quality.

Pupils are able to use ICT in presenting information to others.
This involves the presentation process itself: pupils who are able, unassisted or in cooperation with others, to share or show information with the support of multimedia, for example, an infant on a Monday morning telling the class about his/her weekend with the support of a few electronic photographs or a third level pupil gives a "lecture", using moving electronic images or a pupil from training type 3[2] uses digital photographs to offer a mood shot of his/her course.

Pupils are able to use ICT to communicate in a safe, sensible and appropriate way.
Communicate means pupils being able to use the facilities ICT offers (in the form of words, images, sounds) to provide information or seek it from third parties. This refers to the opportunities to contribute to the learning process, such as arranging meetings by e-mail, sending electronic documents along with an e-mail message, making contacts and collecting information for an educational visit, live chats with pupils from another school, using Internet forums, blogging and videoconferencing.
The words "safely" and "responsibly" refer to the basic rules and ways of interacting in the context of ICT communication and to specific guidelines for chatting and using e-mails safely. "Responsibly" means, for example, that the medium's anonymity is not abused for the purposes of bullying other people. "Effectively" implies the pupils asking themselves in the light of their goals what is the best means of communication.

Pupils are able to make an adequate choice out of different ICT applications depending on the objective to be reached.
The characteristics of an ICT competent person point to someone who, when faced with a problem or goal, is able to choose from a wide range of programs, applications or instruments, electronic or other, in contrast to a one-by-one approach in education where one programme is used for one goal. This is why it is important for pupils to discover there are several ways of processing texts, photographs, diagrams and the like, making calculations, lending support to a presentation, charting the way to the course venue ... These choices have to be appropriate and goal-oriented. Attention should also be paid to the availability of open-source software. All this applies not only the use of software but also the use of means of communication. As we said earlier, pupils may choose the means of communication that fit in most effectively with their goals in the light of their knowledge and experience with the characteristics of this system (such as speed, cost and user-friendliness).

Pupils are willing to adjust their actions based on reflection upon the use of ICT by themselves or others.
Reflection is the result of effectively learning how to choose. Taking into account the resources used and comparing the outcomes, teaches pupils the various characteristics, the advantages and disadvantages of the resources, programs and applications deployed. Hence this is an ICT competence, too, and it is useful when learners experiment with various resources while problem-solving. The products and processes may then be compared.

[2] Special primary education for children who need special help because they have serious behavorial or emotional problems.

This method will offer them the experience they need during a subsequent assignment, thus becoming competent ICT users.

The interfering powers on the implementation of the objectives

Given these objectives, if we are to know how future generations will participate in public life as well as how they might fuel an innovative economy as citizens of a digital society, we need to understand the influences of the diverse curricula.

Diverse curricula

In his book "The Educational Imagination", Elliot W. Eisner distinguishes two different curricula : the explicit and the implicit curriculum.
As a term in educational discourse, "curriculum" is used in a wide variety of ways. It has a common-sense meaning as broad as "what schools teach" to as narrow as "a specific educational activity planned for a particular student at a particular point in time." Yet, the term itself warrants analysis. Initially, the word is derived from the Latin word "currere", meaning 'the course to be run". This notion implies a track, a set of obstacles or tasks that an individual is to overcome, something that has a beginning and an end, something that one aims at completing. In the school context a successful completion of the course warrants a diploma or degree certifying competence.
"Curriculum" has also been conceived and defined as "all of the experiences the child has under the aegis of the school." This conception of "curriculum" was created by progressive educators during the 1920's to emphasize several beliefs they considered central to any adequate conception of education. They felt so strongly about the need to focus on the kind of experience the child had under the aegis of the school that they made a formal distinction between the curriculum, which was the experience (hence each child had a different curriculum because his or her experience was never the same as another's), and the course of study, which was a written document that outlined the content, topics, and goals that a teacher was to use in planning the curriculum for a class or a child. Nowadays, in the context of acquiring ICT-skills, it is not only under the aegis of the school that children learn those skills. We have to take those experiences into consideration.

In his book Eisner refers to the work by Dreeben, Jackson, Sarason and others who provide an extensive analysis of what has come to be known as the "hidden curriculum". Schools socialize children to a set of expectations that, some argue, are profoundly more powerful and longer-lasting than what is intentionally taught or what the explicit curriculum of the school publicly provides. Take for example the form of human behaviour which is called "initiative". It is possible to create a school environment in which the taking of initiative becomes an increasingly important expectation when children mature. In such an environment, when children get older they are expected to assume greater responsibility for their planning; they are expected to increasingly define their goals and determine the kinds of resources they will need to pursue the ends they have formulated. One general

goal of such an institution would be to enable children to become the mappers of their educational journey, so that when they leave school they are in a position to pursue goals and interests that are important to them. If this were an important aspiration of schools, they would make it possible in dozens of ways for such "initiative" to be developed; it would be a part of the culture of schooling.
Critics of schooling point out, however, that rather than cultivate initiative, schools foster compliant behaviour. One of the first things a student learns – and the lesson is taught throughout his or her school career- is to provide the teacher with what the teacher wants or expects. This tendency to foster compliant forms of behaviour is often exacerbated by programs that use behaviour modification techniques.

If we are concerned with the consequences of school programs and the role of curriculum in shaping those consequences, then it seems to Eisner that we are well advised to consider not only the explicit and implicit curricula, but also what schools do not teach. It is his thesis that what schools do not teach may be as important as what they do teach. If one mission of the school is to foster wisdom, weaken prejudice, and develop the ability to use a wide range of modes of thought, then it seems to him we ought to examine school programs to locate those areas of thought and those perspectives that are now absent in order to reassure ourselves that these outcomes were not a result of ignorance but a product of choice.
In identifying the null curriculum there are two major dimensions that can be considered. One concerns the intellectual processes that schools emphasize and neglect. The other is the content or subject areas that are present and absent in school curricula.(Eisner, 1979)

The recognition of the impact of the diverse curricula in relation to the modern media is not new. It was in the 1960s that the work by Dreeben, Jackson, and Sarason was published. Eisner assumes that one of the things they had in mind was what Lewis Mumford was talking about in 1938 in his *Technics and Civilization*. At that time Mumford wrote:
"One may define this aspect of the machine as "purposeless materialism." Its particular defect is that it casts a shadow of reproach upon all the non-material interests and occupations of mankind: in particular, it condemns liberal aesthetic and intellectual interests because "they serve no useful purpose." One of the blessings of invention, among the naïve advocates of the machine, is that it does away with the need for imagination: instead of holding a conversation with one's distant friend in reverie, one may pick up a telephone and substitute his voice for one's fantasy. If stirred by an emotion, instead of singing a song or writing a poem, one may turn on a phonograph record....The brute fact of the matter is that our civilization is now weighted in favour of the use of mechanical instruments, because the opportunities for commercial production and for the exercise of power lie there: while all the direct human reactions or the personal arts which require a minimum of mechanical paraphernalia are treated as negligible. The habit of producing goods whether they are needed or not, of utilizing inventions whether they are useful or not, of applying power whether it is effective or not pervades almost every department of our present civilization."(Mumford, 1938)

If we are to know how future generations will participate in public life, as well as how they might fuel an innovative economy as citizens of a digital society, we need to take the different curricula into consideration.

Teachers and parents and digital skills

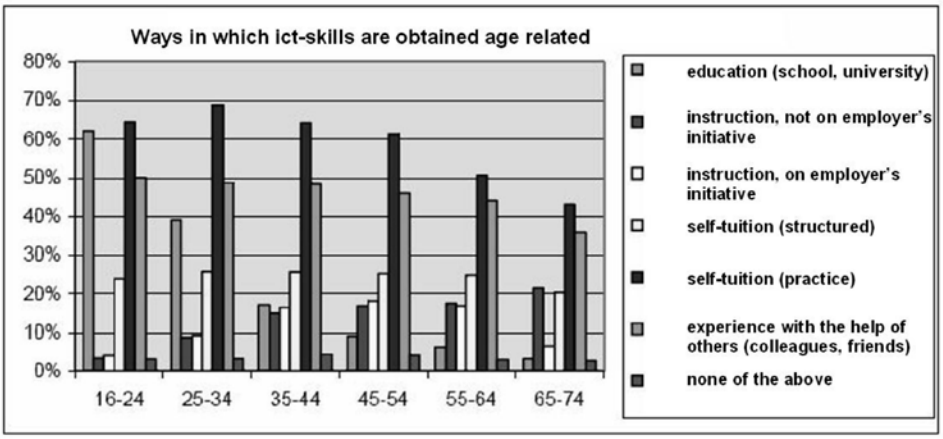
Adults too readily construct a notion of children in a networked society as either "vulnerable, incomplete and inadequate or self-regulating autonomous agents capable of making decisions about media technologies as individuals, with digital skills which far surpass those of adults." (Jo Twist with Kay Withers, 2007)

These notions of children reflect two contrasting visions of technology. The first one refers to technological determinism. This idea operates on the basis of technological progress being patently obvious: a kind of natural, irresistible process in the march of history. It is clear that Lewis Mumford was reasoning from that perspective. Followers of that perspective tend to put a lot of arguments in the dangers that come with the new tools. These stories of fear can be taken to heart by educators and parents, and responses are not usually positive. The regulatory response is to propose to ban access to sites which require a profile page from schools and libraries. This includes social networking websites such as MySpace and YouTube, but also blogs. This is in response to fears that young people may be networking with others who are not who they say they are. This kind of fear is generating a worrying "participation gap" which is characterised by unequal access to the experiences, cultures, social contexts, skills, and knowledge that prepare one for full participation in a global economy. Beyond fear of on line predators, some schools and institutions have reacted to young people's technological habits as pure nuisance. Mobiles and game devices tend to be banned in classrooms and school property because of the disruption they pose to traditional teaching methods and classroom activity. (Jo Twist with Kay Withers, 2007)
Others believe technology is developed in response to a social demand and human needs. Technology is applied to cater for the requirements of the users. The latter tend to overemphasize the effects of the new tools. Here is the result that a lot of new tools are introduced in schools without a clear vision on how to use them for educational aims. Parents overwhelm their offspring with "new toys" without guidance. We recognize this tendency in most advertising about new media.

These general visions constitute in many cases the basis of the null curriculum. By not introducing new media in school pupils are deprived of learning ICT-skills in a learning environment or, if the new media are introduced in a thoughtless way, they will bring more harm than benefit to obtaining digital competences.

Youth and digital skills

As you can see in the table ICT skills are still more obtained outside school. As stated above, the experiences of young people in which they obtain digital abilities outside the



Source: Federal Department Economics – General management statistic and economic information, October 2007.

classroom must be seen as a curriculum that must be taken into account.

It is a common conception that children are more sophisticated users of new technologies than older users. It is also so that young people are more likely to learn these skills from their peers and siblings, rather than from adults. Jo Twist and Kay Withers give an overview of the different ICT-skills pupils obtain outside school.

Millennials expect to gather, create and share information across multiple devices and places. They sort out what communication and information belongs on which device and under what circumstances to suit their needs.

They are multi-taskers, who are juggling texting, talking and doing other activities in ways which are by adults very often interpreted as inattentive. However, multi-tasking and attention should not be seen as oppositional. Instead, these might be considered as precisely the kinds of skills that knowledge workers of the future might need. Some suggest that the attention span of teenagers mirrors that of top managers operating in a rapid, context-shifting world.

The kind of worlds pupils interact in through games, on line games in particular, can be shared places of learning, contexts for thinking through complex problems, hierarchies, economics, and even science. They offer a sense of "physical" proximity to others which few other on line spaces give. Game rules offer a framework through which to probe, hypothesise and test. Active discovery in these contexts means the learner becomes a co-producer of knowledge, vital to a "personalised learning" paradigm (Elspa, 2006).

A lot of pupils use different kinds of technologically mediated networks to make and maintain different levels of connections to distinct peer groups. Technologies help cement existing off line relationships and networks as well as forging new on line ones. The motivations behind the digital choices young people make when they reach out into different networked social worlds are complex.

Through this networked cultures pupils are in more direct ways learning from peers. They are exposed to, and challenged to think about, power and the importance of different cultural practices. Young people are using digital spaces to explore identity, their place in the world and their understanding of how society and culture works.
New models of literacy suggest that different kinds of digital contexts have different levels of dynamism and participation that can fundamentally change the way one thinks about and understands something. Technology thus becomes a prop of literacy.

There seems to be a divergence between how young people have adopted and use digital media technologies and devices, and what the in authorities – schools, parents or the mainstream media – allow or wish young people to do under their "watch". We are witnessing an educational deficit between new media activity at home, in private, and that which takes place in formal educational and public environments. (Jo Twist with Kay Withers, 2007)

How to bridge the gap

As you can derive from a closer look at the cross-curricular final objectives above, these objectives are open-formulated to cover the different dynamics that are going on.
The challenge is situated on the level of the schools and the classes where visions on technology oppose the founding vision of the cross-curricular objectives and by doing so neglect the energy young people invest in acquiring essential ICT-skills to participate in public life, as well as to fuel an innovative economy.

On policy level

The Dutch philosopher Jos de Mul hits out at both visions on technology mentioned above, which he basically regards as determinist. He puts forwards the interesting idea of technological interactionism, thereby resisting any tendency to attribute primary responsibility to one or more factors that patently play a role in technological developments. Interactionism holds that social developments and technological design processes interact, implying that technology is both the cause and outcome of social processes or evolutions. This theory offers an interesting opportunity for education: education is a consumer of technology made elsewhere, but developments and specific applications may also be guided by education in the light of specific needs and specific ways of working.

Conditions for effective ICT integration at all educational levels

A number of key preconditions have to be met for the implementation of the ICT-related final objectives. These preconditions refer to the policy-making capacity and the support of educational establishments, staff training for teachers, the infrastructure and teaching aids. In order to cater for this, the Government of Flanders is applying a five-point flanking policy.

- Strengthening the policy-making capacities of educational establishments at institutional level

Educational establishments are required to make a lot of strategic choices in the context of teaching ICT: what infrastructure to provide, the location, in computer rooms, in standard classrooms, what purchases should be made in terms of software, what refresher courses have to be taken and by whom, etc. Therefore the establishments need to have a clear perspective and sufficient policy-making capacities.

An approach towards ICT integration means that every educational establishment has to decide what it considers to be effective education and how ICT can act as a catalyser in this respect. Only when a team has taken this hurdle it can make a suitable assessment about the required infrastructure, training and adjustment to the education content.

The Flemish authorities are keen to boost the policy-making capacities of educational establishments so the latter may develop an ICT policy according to their needs, rather than accepting "new" imposed measures. A separate ICT initiative, for example, is not being applied but managements will be provided with instruments – if they wish so – so they will be able to incorporate a high-quality ICT vision into the school development plan. The instrument that has been developed for that reason is pICTos (planning ICT on school). pICTos is an on line environment that is designed for use in the wider frame of continuing education about ICT, vision and policies. The designers paid special attention to the ease of use: you do not need to be an ICT expert to be able to work with it.

pICTos is a practical tool which assists schools to create an ICT policy plan tailored by the school. This plan includes a description of the overarching vision of the school on the role of ICT for learning and teaching. It also gives a view on the current situation in contrast with the situation the school aims at both in terms of ICT equipment and in terms of the cross-curricular objectives that the pupils must obtain. Based on the responses to an ICT implementation checklist, the school obtains an overview of the desirable actions. Actions in function of the professionalizing of the team and on the organization of ICT force at school, this through the design of an educational path drawn in time to reach the given cross-curricular objectives.

- Promoting the professionalism of educational staff

A second precondition for introducing the ICT-related final objectives is that the teachers have sufficient competences to use ICT in a teaching context. Hence, as well as ICT competences, teaching staff must have the teaching skills to transfer the competences and deploy ICT in the daily learning environment.

The regional expertise networks were set up in 2000: five networks spread throughout Flanders for the purpose of offering large-scale further training in ICT at educational, technical and organisational level. Starting in the 2003-2004 school year, the various networks were incorporated into a single expertise network with a central overseeing system: "REN Vlaanderen". A three-year management agreement has been concluded with REN Vlaanderen. A key operational change was the shift from supply to demand-based training. Teachers, head teachers, ICT coordinators from all educational levels and net-

works and teacher trainers represent REN Vlaanderen's target group. The management agreement with REN Vlaanderen came into effect on 31 August 2006.
A new management agreement was concluded with REN Vlaanderen in September 2006. The Government of Flanders committed itself to a three-year cooperation arrangement. However, the method of operation was once again completely adjusted on the basis of the current situation. In terms of content the focus has to be on the introduction of the ICT-related final objectives and developmental objectives. A far-reaching system of formal cooperation with the educational supervisory services is required towards this end. The cooperation is rooted in the organization of REN Vlaanderen. In addition to offering core opportunities for further training REN Vlaanderen also has a theme-specific effect. Every year a minimum of one and a maximum of three themes concerning specific flanking measures are formulated, such as further training, material development and value build-up activities. The ICT coordinators and educational supervisory services have to be involved in choosing the themes.

- Providing a high-quality infrastructure
The PC/KD program (1998-2002) mentioned above was worth nearly 93 million Euros. These resources for infrastructure and further training did have an impact. Nearly all the European standards have been obtained.
The programme provided a major incentive for deploying ICT in the daily environment. The educational establishments were then expected to use their operating budgets to make the required replacement investments, but the progress made in this area was limited. When the cross-curricular objectives were introduced (2007) some of the infrastructure had become obsolete. In order to remedy this, the introduction of the objectives was set to coincide with a one-off catching up exercise for ICT infrastructure.

- Developing a suitable teaching aids policy
On top of hardware, suitable software and digital teaching aids are required to be able to focus on ICT competence in a rich learning environment. The software and digital teaching aids requirements are legio varied: educational software and interactive digital educational content such as information programs, exercise packages, communication tools, digital courses and tests, on line educational applications and image and sound for educational use, software for general use, such as a browser, office applications and multimedia packages for audio, video or photo processing and system software such as the operating system, security software, an electronic learning environment or other network-based applications.
One of the key projects in Flanders applies to the creation of an educational portal site. This is a multipurpose electronic knowledge centre. This type of portal site first of all acts as a central access point for educational information and support. This involves developing and offering information, examples of good practice and thematic files to various target groups. These may be general or specific themes (such as dimensions involved in the integration of ICT, learning participation, lifelong learning, special needs education, broad-based school, ...).
The portal site also offers opportunities for effective digital teaching aids (e-learning op-

portunities) in an accessible and structured way. Consequently, a framework has to be developed allowing individual teachers - but for example publishers as well - to publicise their programs, examples and curricula on line in order to reach a wider target group.
The campaign to introduce open source software into the Flemish education system has helped to raise the profile of this type of software to a significant degree. This continuing focus reflects the multiple opportunities offered in this area for education. Now an initial awareness-raising stage has been completed, a second phase has been started where the focus is on actual support for the open source software community in education on top of basic information.

- Research and ICT monitoring
The introduction of cross-curricular ICT final objectives and developmental objectives goes hand in hand with an extensive data gathering and knowledge building process about various dimensions of ICT integration. This involves not only the trend in ICT skills amongst pupils and teachers, but also the ICT infrastructure : how it is used, perceptions about the use of ICT and ICT integration.
Scientists from the Universities of Ghent and Leuven are developing a monitoring instrument proving information about four types of indicators: ICT competences of pupils and teachers, ICT infrastructure (computer/pupil ratios, PC Internet /pupil ratios, type and age of PCs, Internet facilities, ...), the use and integration of ICT in the learning environment (level and type of use of ICT, use of electronic learning environments, methods, ...) and relevant stakeholders' perceptions about the educational use of ICT.

The research also covers the development of a (web-based) tool to be deployed for a biennial sample, so the authorities can constantly keep track of ICT integration trends.

All theses actions are important to balance the concerned forces to obtain that pupils will have the digital skills needed for the future market but most of all to implement the goal assumed by the Flemish Government. As mentioned above, the experiences of the pupils are also very important in these processes.

In the classroom

In his article "How to teach with technology: keeping both teachers and students comfortable in an era of exponential change", Marc Prensky states: *"Some have opined that earlier technologies that were initially touted with great fanfare for their potential to changing education, such as television, didn't change much at all. I submit that all these technologies – especially television – did change education radically. Just not in our schools."*

It would be foolish of us to let the same thing happen with all the newly emerging digital technologies. This time the learning is much more direct and important, and the pupils already know it.
It is a huge one-time leap from the analogue world of our past to the digital world of the hyper-changing future, because of the speed of continuous change, future teachers will

always be behind the technological know-how of their pupils.
The gap will always be greatest in the lower grades, but whatever the technologies of the future turn out to be, creative and intelligent use of them in service of real important societal goals such as communication, education, and greater understanding, will still remain the thing that counts.
In Prensky's view, the only way our schools will ever adopt and benefit from the new technologies that the pupils want and need is if everyone - pupils and teachers - remains comfortable (or at least reasonably comfortable) in the process. This can only happen insofar as each group acknowledges the strengths of the other, requiring from them that they employ their strengths as fully as possible, while learning simultaneously and gradually about the areas where they are weaker.
To use the twenty-first century's rapidly emerging technology effectively for education, pupils and teachers must invent best practices together. (Prensky,2007)

Conclusion

Educational events or activities do much more than what is intended : they influence people in a wide variety of ways. As we have seen above, the influences on educational activities (formal and non-formal) to gain digital abilities are divergent. They depend on the vision of technology of the school, teacher or parents and on the social network that surrounds the young.
Today's anxieties over the digital divide merely represent the latest steps in a long-standing struggle between critical and enlightenment positions, whose outcome will influence those who will have the power to benefit from information and communication in a technologically-mediated twenty-first century.
Learning in a digital age, argues cultural commentator Charlie Leadbeater, should develop everyone for independent critical thinking and collaborative problem solving.
The more participative learning is, the more successful, allowing us to shape what we learn, communicate and explore ... When children are excited, motivated and inspired they are more likely to acquire new knowledge, skills and understanding. (Leadbeater, 2006)
This sounds obvious enough to those in education. But the devices we use to capture this are being employed unconsciously by young people in ways that educators are not fully aware of. Leadbeater suggests profound changes in the design of our education system are needed if we are to move towards a culture of mass innovation that will locate countries firmly on the global economic map of the future. But, he argues, current debates about education remain obsessed with the means of education: standards and testing. This clouds the ultimate aim of an innovation-led economy which is to foster skills so that creativity can be exploited for social or commercial ends. (Jo Twist with Kay Withers, 2007)
If this is the goal we aim at, then we will need to tune the diverse curricula so less as possible energy is wasted to let the pupils "run the course" to obtain the necessary digital skills.

References

Commissie van de Europese Gemeenschappen (2005) *Mededeling. 2010 – Een Europese informatiemaatschappij voor groei en werkgelegenheid*, Brussel: Europese Commissie

Commissie van de Europese Gemeenschappen (2006) *Mededeling. De Europese elektronische communicatieregelgeving en –markten in 2005 (11de Telecomrapport)*, Brussel: Europese Commissie

Commission of the European Communities (2006) *Recommendation of the European Parliament and of the Council on key competences for lifelong learning,* Brussels: European commission 2006/962/EC

De Mul, J. (red.) (2002) *Filosofie in cyberspace. Reflecties op de informatie- en communicatietechnologie.* Kampen: Klement

Eisner, E.W. (1979). *The Educational Imagination,* New York: Macmillan Publishing CO., Inc. and London: Collier Macmillan Publishers

Elspa (2006). *Unlimited learning: Computer and video games in the learning landscape*, http://www.elspa.com/assets/files/u/unlimitedlearningtheroleofcomputerandvideogamesint_344.pdf <2 april 2008>

ERNIST ict school portraits, 20 school portraits of innovative use of ICT in six European countries

Goegebuer, A. (2004). *Audiovisuele vorming in het Vlaamse Onderwijs.* Gent: Vlaams Steunpunt voor de Audiovisuele Kunsten

Jenkins, H. (2006). *Convergence Culture: Where Old and New Media Collide,* New York: University Press

Leadbeater, C. (2006).*The ten habits of innovation*, Provocation paper 01, London: Nesta

Livingstone, S. (2004). *Media Literacy and the Challenge of New Information and Communication Technologies*, The Communication Review, Vol 7, 2004. pp 3-14

Mumford, L. (1938). *Technics and Civilization*, New York: Harcourt, Brace and Co.

Twist, J. and Withers, K. (2007). *The challenge of new digital literacies and the 'hidden curriculum'*, in Emerging technologies for learning, volume 2, Becta

Perkel, D. (2006). Copy and Paste Literacy: Literacy practices in the production of a Myspace profile', http://www.ischool.berkeley.edu/~dperkel/media/dperkel_literacy-myspace.pdf <2 april 2008>

Prensky, M. (2007). *How to teach with technology: keeping both teachers and students comfortable in an era of exponential change,* in Emerging technologies for learning, volume 2, Becta

Standaert, R. (2002). *A search for a new curriculum for compulsary schooling*, in Conference proceedings cross-curricular themes, Brussels, 11-12 October 2001, Brussels, The Ministry of the Flemish Community Department of Education, Policy Co-ordination Unit

Vandenbroucke, F. (2007). *Competences for the knowledge society*, Brussels, The Ministry of the Flemish Community Department of Education

Key competences and the implementation ladder

The Common Base for Knowledge and Skills in France: debates over the concept of "competence" and other obstacles

— *Maryline Coquidé, Hélène Godinet, Alain Pastor and Jean-Marie Pincemin*

Introduction

The non-disciplinary or "transversal" competences are currently the subject of special political educational attention in several Western countries (Quebec's Superior Council of Education, 2007). To analyse non-disciplinary key competences in the French Socle commun[1], we focused on the competence to communicate, on numerical competence, on learning to learn, on social and civic competences, and on business and entrepreneurship. Eventually, a series of obstacles is analyzed.

The comparison of the contexts and contents of the European Recommendation[2] and its French interpretation leads us to distinguish the goals and envision various interpretations of the notion of "competence". The analysis of the issues and references of the *livret individuel de compétences* (individual booklet of competences) that is currently used in French schools underlines an array of tensions. We conclude with advancing several hypotheses, relating to French educational "culture", to help the reader understand the interpretations and tensions surrounding these changes.

Brief presentation of the French educational system

In France, schooling is compulsory for children from 6 to 16.
Curricula are defined by the Ministry of Education and comprise national syllabuses. They are compulsory: each class is expected to reach the level of education defined in the syllabus so that all pupils are ready to take the national tests at the same stage.

Premier degré (Preschool & primary education)
Preschool teaching is very developed: almost every child between 3 and 5 goes to *l'école maternelle.*
Primary schools welcome pupils during five years from the preparatory course to the 2nd year of the *cours moyen* (middle course). Since 1990, preschool and primary school teaching is organized in multi-year cycles. A list of competences was established to define what students are expected to master when completing each cycle. Although recommended for more than fifteen years, the implementation of these cycles is not very effective in schools.

[1] Throughout this article, we will refer to the French *Socle commun de connaissances et de compétences* (Common Base of Knowledge and Skills) as the « Socle commun".

[2] Throughout this article, we will refer to the Recommendation of the *European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning* as the " European Recommendation".

Cycle 1: Introductory learning phase (1st and 2nd sections of école maternelle); 3-4 year-olds.
Cycle 2: Basic learning phase (3rd section of école maternelle, preparatory course and 1st elementary course of primary school); 5-7 year-olds.[3]
Cycle 3: Development phase (2nd elementary course, 1st year middle course, 2nd year middle course); 8-10 year-olds.

In the *premier degré*, teaching is organized around the class-group unit. Its management can take three different forms: a teacher looks after a class-group during a complete cycle/ class-groups contain pupils of different levels/class-groups can temporarily switch between teachers according to their respective areas of specialisation.

Deuxième degré (Secondary education)
The *collège unique* is characterized by a national uniform framework. It welcomes all students coming from elementary school. Organized in four years (6th, 5th, 4th and 3rd classes, for kids from 11 to 15), lower secondary teaching comprises three successive cycles: the adaptation cycle, the central cycle and the orientation cycle.

Adaptation cycle: (6th) 11-12 year-olds.
Central cycle: (5th and 4th) 13-14 year-olds.
Orientation cycle: (3rd) 15 year-olds.

At the end of the 3rd cycle, students take the national diploma of the *brevet*, which is not necessary to enter the higher secondary level: the *lycée*.

Secondary teaching, organized by discipline is undertaken by specialized teachers.
After an academic training and a specific disciplinary pedagogical training, potential teachers can apply and be appointed in *collèges* or *lycées*.
Several successive reports raised the difficulties linked to the strict disciplinary division of this teaching. They advised reshaping the programs of the *collège*, in particular by merging and reorganizing this teaching within "six big themes of convergence". The latter are registered in the project of constitution of disciplinary categories launched by the *Conseil National des Programmes* in the mid-1990's (Ferry, 1995).
Since 2000, French educational policies have tended to introduce variations in the *collège unique*, both in its organization and in the curricula (Dutercq & Derouet, 2004). Indeed, institutional innovations or measures boost the implementation of new/experimental/ local strategies, such as "diversified paths", "cross-disciplinary work" or "discovery journeys", promoting the use of ICT, dispersion of the class unit, interdisciplinary activities, guidance activities, school life activities (extracurricular clubs, ...). The introduction of pedagogical councils in every secondary school, in order to boost, coordinate and evaluate projects in September 2007 also contributes to the new *collège* governance.

[3] Since repeating classes is possible as early as the primary school, pupils can be a few years older than indicated.

A common base of knowledge and skills for compulsory education

The Law of Orientation for the Future of the School (April 23rd 2005) has validated the concept of a common base of knowledge and skills for compulsory education for primary and lower secondary schools. This *socle commun* is structured around seven *pillars* and is accompanied by an *individual booklet of competence*.

Five competences are already covered by current teaching programs: Mastering the French language (pillar 1); Speaking a modern foreign language (pillar 2); Basic knowledge in mathematics and scientific and technological culture (pillar 3); Mastering common ICTs (pillar 4); Humanist culture (pillar 5).

Two additional domains appear in the French school in the form of previously non-explicit categories: Social and civic skills (pillar 6) and Autonomy and initiative (pillar 7).

Key competences and the Socle commun: context and general presentation

In France, to remedy the problem of pupils leaving school without basic competences, the Law of Orientation for the Future of the School has focused the educational system's missions on guaranteeing equality, assuring each student's success via the acquisition of a common base of knowledge and skills and facilitating the entrance of youth in the world of work. Consequently, the decree of July 11th 2006 has organized the content of this *socle commun*: *"Compulsory schooling must at least guarantee to each student the necessary means for the acquisition of a socle commun constituted of a body of knowledge and skills that must be mastered to be successful at school, to progress one's training, to build one's personal future and to have a successful life in society".*

As early as the preamble, the definition of the *socle commun* explicitly draws on the European Recommendation in the matter of "key competences for lifelong learning". It links issues of personal development and of social aspects, issues of citizenship and economical issues to the issues of compulsory schooling. Envisioned as the foundation of teaching, it is presented as the "cement of the Nation" and as a body of values, knowledge, language and practices.

Nevertheless, when comparing the European key competences (KC) and the *Socle commun*, both convergences and differences appear. For example, KC5 "Learning to learn" does not exist as such in the French document. It mainly concerns lifelong learning, covering a wider span than the French document, which focuses on compulsory education. The *Socle commun* nevertheless contains elements of "Learning to learn" in its approach to students' autonomy (Pillar 7), but from a slightly different angle: intellectual capacities are also mentioned, but they are not as much associated with employment skills, and they are complemented by physical awareness and abilities (knowledge of one's physical limits, ability to swim...).

KC8 "Cultural awareness and expression" does not exist either as such in the *socle commun*. The aptitudes and knowledge linked to this domain are disseminated in other pillars, notably in pillar 5 "humanist culture". In comparison to the European Recommendation, the latter appears as a national addition to the *socle commun*. The "cultural" perspective

combines humanities competences (that one can find in KC6 or 8), but the pillar "humanist culture", under a universal label, deals with the elaboration of a national identity in relation to Europe, the acquisition of a general cultural background (including geography, history, religion and politics) and the development of a literary and artistic culture.
KC6 and Pillar 6 "social and civic competences" seem relatively equivalent, as suggested by their common label. Both individual and collective perspectives of citizenship are present in the two texts. However, a close look at the terminology used reveals different viewpoints: again, the French conception of "culture" (humanist and scientific) contrasts with the European inventories of aptitudes and competences.
The difference between KC7 "Sense of initiative and entrepreneurship" and pillar 7 "Autonomy and initiative", already shows in their titles, particularly by the professional/business reference of the European Recommendation. Both versions highlight the capacity to analyze, to understand and to put in perspective, but KC7's business orientation, in a commercial or professional framework, with a specific and explicit ethical quality ("fair trade", "social enterprise") is left out in the *socle commun*.

This initial comparison between KCs and the *socle commun* can be further elaborated by a deeper analysis of the convergences and differences that can be found between the KCs and the pillars dealing with the competence to communicate through languages and numeracy.

Competence to communicate through languages: various interpretations of "competence"

The use of competences in initial and continuing teacher education to fight against disciplinary fragmentation of approaches such as "teaching by objective" gave birth to an abundant literature. For Jonnaert (Jonnaert and Al., 2006) the conception of competences in education depends on the authors' epistemological position, on the conception of the object to which the notion of competence refers (eg the student, the activity, the circumstances, the knowledge, the capacity of...), on the perception of competence as either a state or as a process, on the breadth and outcome attributed to competence. It appears difficult to define the term 'competence' without considering the learning context (and related processes of assessment) in which it is embedded.

Origins of the debate on the notion of competence in language

For language and, more widely, in the field of communication, competence is neither a new nor a neutral notion: it has been the object of recurrent semantic drift, even in official texts, which makes its use extremely problematic. Historically, the notion relates to the debate between Chomsky and Hymes. Chomsky used the competence notion to mean the capacity every speaker of a given language has to recognize and generate all the grammatically correct production of this language. Similarly to the Saussurian distinction between language and word, Chomsky's competence is opposed to the concept of performance by speakers of a language. The competence notion relates to an abstract ability to

produce language (the one of an ideal speaker) to recognize and generate a grammatically correct production, based on an innate knowledge of the language's mechanisms that depends on a specifically human capacity: the LAD (language acquisition device). Performance cannot be the object of a linguistic study as the number of the language productions is infinite and reflects only partially this innate competence.
Hymes was at the origin of radical criticism of Chomsky's position. This criticism can be considered the beginning, from the mid 1970's, of a pragmatic orientation to language, the communicative approach or the action-oriented approach of the Common European Framework of Reference for Languages (CEFR). Using an ethnological standpoint, he endorses the performance aspect of language, while widening the ability to domains other than grammar, by insisting on the multi-code nature of linguistic productions, and by focusing on the social dimension in the study of language. What was "performance" for Chomsky becomes "competence" for Hymes: competence to communicate (and not only grammatically or linguistically), which relates to a capacity to use a variety of speech acts according to the contexts (speech events). This approach emphasises the pragmatic efficiency of speech over syntax, which is now considered only as one resource for language.

Current evolutions of the debate on the competence to communicate linguistically

This theoretical debate corresponds very concretely to remaining cleavages in the conceptions at work in language teaching today, even if the reference to the Chomsky-Hymes debate is not explicit anymore. One can consider that the tendency still dominating in teaching is to see linguistic knowledge (code mastery, grammatical correction especially) as a prerequisite to language use in context. However, a very strong reforming current tries to change these conceptions: CEFR's action-oriented approach views language learning not as a prerequisite to its use but straightaway as a form of social use. The focus is therefore put on the social function of language, the contexts and the outlines of use, and not on the acquisition of an independent competence: "Competence does not lie in the resources to mobilize (knowledge, capacities...) but in the very mobilization of these resources. Competence is about "being able to mobilize""(The Boterf, 1994).
For the CEFR, the competence to communicate and act linguistically is therefore considerably widened. In a school environment, it opens up language learning (maternal, foreign, second...) to activities that are not specifically disciplinary. This broadens the function of language teaching to benefit other fields of knowledge from non linguistic disciplines. However, opening does not mean blending: there remains an impassable tension between the two dimensions of linguistic activity. This tension probably partly explains the use of a terminology that has not yet stabilized around the term of "competence".

Key competences and Socle commun: prerequisite competence or resource competence? Complex functional situation or school situation?

The European recommendation on key competences tends to promote functional use in complex situations (key competences, 2006: p.5).
In France, the last official instructions on language teaching in primary schools introduce a new concept: the "capacity" (*Bulletin Officiel*, August 30th 2007). The capacity covers

what was designated as linguistic functions in the communicative approach (to introduce oneself, to apologize...) and adds elements linked to the use of language in class (spelling familiar words, understanding instructions...). The text highlights the distinction between capacity, as a pragmatic notion, and knowledge (culture, grammar, phonology), which constitutes a potential resource. In the CEFR, mastering the linguistic code is not considered as a knowledge anymore, but as a competence. In the *Bulletin Officiel* of August 30th, the action-oriented approach is framed by the affirmation that "communicative competence is definitely too complex for any general teaching strategy to be effective in a school context". Obviously, it reduces the scope of situations in which language will be the object of a functional use for this target group (beginners in elementary school, cycles 2 and 3). The *socle commun* only evokes "various situations" in which "the capacity to understand, to express oneself and to interpret..." will be implemented, but clearly states that: "To practice a foreign language, one must **first** integrate the linguistic code". The term "first", whose meaning (chronology? hierarchy?) needs an explanation, illustrates the priority granted to the linguistic code.

This brief look at the European and French texts seems to show that, beyond a common reference to the CEFR, the perspectives are not completely identical: the French texts tend to promote the "competence", as the resources requisite to language use, comparatively weakly contextualized (internal to the language class, especially for beginners), while the European texts define the acquisition method linked to function bound in complex situations, in which knowledge of the code is only one resource, which brings us back to the Chomsky-Hymes debate.
It is necessary to get rid of this ambiguity about linguistic competence: Indeed, referring to an action-oriented perspective (CEFR) while asserting the necessity to master linguistic codes "first" implies an internal theoretical problem of coherence and of practical implementation.

Numerical competence versus numerical culture: complex expectations

Numerical/digital competence, culture or literacy, information education, numerical alphabetizing, mastering common information and communication technologies (ICT), critical use of information society technologies (IST): the terminology associated with this competence is still unstable.

An ambitious framework of references and objectives

Covering the educational uses of numerical technologies and world-wide networks of communication and information broadcasting, this domain gives rise to complex expectations: "To reply to the challenges of globalization and to the evolution towards knowledge-based economies". It is a matter of knowledge, will and ability to produce, broadcast, build and share knowledge, to apprehend the role of numerical technologies in society's fast mutations, to be conscious of the provisions and risks involved with the virtuality of information and communication spaces (UNESCO, 2005).

The reference document for key competences (DeSeCo, 2002) insists on the high level of requirement beneath the notion of numerical culture: "To harness such potential, individuals will need to go beyond the basic technical skills needed to simply use the Internet, send e-mails and so on. As with other tools, technology can be used interactively if users understand its nature and reflect on its potential" (DeSeCo, 2002: p.11). The European Recommendation uses both the terms numerical competence and numerical culture and decline related competences (EC, 2006: p.6). The text focuses on the necessary development of critical thinking and on the awareness "of issues around the validity and reliability of information available, and of the legal and ethical principles involved in the interactive use of IST".
These definitions of digital culture and numerical competence go far beyond simple knowledge and identified know-how; they suppose, more or less explicitly, a transformation not only of educational spaces and times, but also of the relationship to knowledge (UNESCO, 2005: p.47).

Digital culture versus mastering ICT in the socle commun: a learning domain with fuzzy borders.

The terms *digital competence* and *mastering information and communication technologies* correspond to different but complementary objectives. The first one is about information treatment (creation, broadcast, search, extraction, classification, consultation, indexation, modification, exchange, division, archive...). The second deals with technological alphabetizing, i.e. the development of abilities and technical knowledge necessary to use properly the information and communication tools that are available in a network society. In addition, one needs to develop critical thinking to be able to check the validity of the news circulating in the network and to use it responsibly. Hence, the term *digital culture* refers not only to a technical culture, i.e. a more or less advanced mastery of digital devices, equipment and software, that allows data conception, transfer or archive. Here, culture must be understood the way anthropologists use it: it is what must be known to belong to a given society, from a perspective both individual (the individual's general culture) and collective (the values of the society one belongs to). All this implies "the mastery of certain cognitive, critical and theoretical skills" (UNESCO, p.46) that students ca acquire both in school and elsewhere.

In the *socle commun*, the 4th pillar "Mastering common information and communication technologies" (ICT) deals with this domain. The text states: "The digital culture implies the sure and critical use of information society techniques" (MEN, 2006: p. 16).
For nearly four decades in France, schools chose to integrate computer technologies within educational practices. Approaches centred on the computer have little by little been replaced by questions centred on the use of ICT. Both technological and human networks envisage new ways of constructing collective knowledge and new ways of knowledge acquisition which complement the traditional oral and written channels. The appearance of the Internet in schools showed that it involved new teaching and learning methodologies (Bardi, 2002; Lepetit, 2007). Research observations revealed the complexity of the competences that using ICT both requires and develops: technological, communicative and lin-

guistic competences. They also underline the difficulty for institutions and educational actors to cope with radically new situations: the use of networks, the opening up of the class to the world, instant access to information networks, risks linked to the data virtuality...

Assessing digital competence: the B2i certificate in France

In November 2000, a first decree (BO n° 42 of the 23/11/2000) defined the B2i (Booklet IT & Internet), and its objective: "to specify a body of significant competences in the domain of information and communication technologies and to certify their mastery for the students concerned". The B2i identifies five large domains of competences as follows: "1) To get used to a digital work environment; 2) To adopt a responsible attitude; 3) To create, produce, treat and exploit data; 4) To get information; 5) To communicate and exchange. For each domain and each level, a goal is defined, corresponding to the expected competence. This competence associates knowledge, capacities and attitudes, assessed through several component items. All teachers have the possibility of validating the component items of the competences' that are listed in the B2i's pages of evolution. They progressively validate the items when the student/apprentice estimates he/she has obtained them." The B2i is delivered as a certificate of "developed and valid competences in disciplinary, interdisciplinary and transversal activities".

Progressively implemented, the B2i generated reluctance, mostly explained by a lack of equipment, of teacher training and of implementation guidelines. Other issues need clarification: which interpretation of the numerical competence should be taken into account? Who is responsible for the development and certification of a competence that is not linked to a discipline and that does not relate to an expertise domain. Indeed, these challenges associated to the B2i illustrate the assessment revolution that the whole *socle commun* implies. To this day, the new collective, progressive means of assessment are relatively rarely used by teachers, and mostly by technology teachers.

Beyond the case of digital competence, we can consider the relationship between assessment and the *socle commun* competences.

Socle commun and assessment

In the French educational system, "institutional" assessment can be considered something of a tradition. For example, since 1989, several national assessments of students have been implemented, at the beginning of the CE2 and when entering the 6th class (collège), to identify students strengths or weaknesses and to establish national references. However, either these data remain underused in classes or their initial diagnostic function is diverted for the purpose of writing academic or national reports. With the *socle commun*, assessment takes another dimension. Indeed, the *socle commun* implies a requirement to implement a personal booklet for each student in order to follow their progressive acquisition of competences.

The student's personal Booklet of Competence

Since September 2007, several versions of references for the booklet of competence have become available, and have been tested by teachers in several schools. Each student's "base mastery" must thus be evaluated in three steps (CE1 , CM2 and at the end of compulsory schooling). And it is specified that "the mastery of a capacity or competence must be assessed repeatedly, in distinct situations, if necessary at a time different from the introduction of the concerned knowledge or capacities".

Nevertheless, several difficulties appear, both in the experiments undertaken in some classes and in assessment uses. A previous very informed and argued report had anticipated some of these difficulties and suggested some recommendations (IGEN Report, Houchot A., Robine F. & al (2007). The attention was put on the lexical and conceptual shift of the notion of competence in the French school system: what used to be designated as "competences" in programs and evaluations henceforth were classified under capacities or knowledge, or under attitudes to get in the *socle commun*. Indeed, the seven "pillars" are completely different from the old notions of competences. Facing this confusion, the report called for the elucidation of what was to be assessed: general competence, single item, or knowledge? Now, in institutional injunctions, ambiguities remain with the use of a same term to designate different notions or uses of different terms for one notion: competence, capacity, know-how, knowledge. The report then pointed to the problem of intermediary levels of acquisition, and the necessity to define the steps of acquisition. And the references for the booklet of competence that are currently experimented offer a rather cumulative approach to "knowledge and capacities". The booklet of competence's perspective can look like the constitution of an additional "network" of micro-competences, with a risk of fragmentation in assessment.

In its conclusion, to facilitate the conception of a flexible and relatively simple scheme, the IGEN report recommended an analysis and the setting-up of a hierarchy of the competences to evaluate.

On going tensions

Tensions "intra system"

The current disciplinary programs enumerate contents in terms of knowledge (notions and concepts, level-specific disciplinary know-how) and of competences to obtain (competences aimed at the end of the year/cycle: their level is specified by a list of tasks that students must pass). Approaching "competences" in terms of "tasks" is not the perspective recommended in the *socle commun*. In addition to this "intra education system" tension, other tensions can currently be observed in the on going transformation process.

Tension between "national perspectives" and "local effective practices"

The socle commun is conceived as national and obligatory, but difficulties of local implementation, in particular in the *collège unique*, are, for several researchers (Dubet, 1999), linked to the gaps between the political project and the organization of education and curricular choices (programmes, teacher training, teacher-student relationship...). Tensions appear between national prescription and local implementation, according to the con-

text, the balances and organisational habits, the communities' and the schools' demands and aspirations. These difficulties influence teachers' local practices. To allow these local adaptations, the Article 34 of the Law of Orientation of April 23rd 2005 proposes and incites schools, in the framework of their educational freedom, to obtain "dispensation" in the form of educational experimentation.

Tension between "individual" and "collective"
Another tension concerns the more "collective" perspectives of assessment. The Booklet of competence is a tool to be shared by a team of teachers, while they still have little collective experience in assessment. Hence, for pillars 6 and 7, which explicitly relate to all disciplinary teachings, the current approach of the Booklet's references rather seems to enumerate a sum of capacities and knowledge coming from different disciplinary cultures (History, Geography, civic instruction, sports, Earth and Life Sciences).
Besides, the Booklet seems to reinforce an essentially individual conception and approach of learning. In fact, if a level is not reached, the only envisaged remedy is the "Personalized Programs of educational success" (PPRE), the limits of which have already been exposed (report IGEN, Knight coyot and Al. 2006).

Tension between "entry" and "exit"
Assessment is still rarely conceived as a learning process, but rather as a final phase report, a level of performance check. Is competence viewed as the "end of learning", or are we talking about a "starting point" through competences?
Furthermore, shifting assessment towards some sort of elaborate tutoring of the learning process necessarily implies the coordination of new assessment practices and school governance strategies.

Tension between the old and the new
Finally, there is of course a tension between the old and the new, but not only in terms of resistance to change. This is rather the *process* of change in the teachers' representations, in particular in the nature of their job and in the forms of assessment and on the educational practices that could be entailed.

In conclusion: a French "cultural" educational context

The lifelong learning orientation of the European KC and the one concerning the obligatory teaching of the *socle commun* in France induce two different target groups and different learning situations. Besides, the European Parliament's Recommendations have been formulated so that all the European visions can relate to it. One can find French specificities in the additions, modifications or remodelling of the KC in the *socle commun*. It is particularly visible through the notion of humanist, scientific, or general "culture", as opposed to a European listing of competences.
In addition, despite the will and the vision for a *socle commun*, the booklets of competences and the current reformulation of curricula show tensions with the French model which has yet to integrate or to surpass its disciplinary roots.

References

Bardi A.M., Bérard J.M. (2002) *L'école et les réseaux numériques.* MEN. Rapport IGEN. Paris: IGEN, juillet 2002, pdf 74 pages.
ftp://trf.education.gouv.fr/pub/edutel/syst/igen/rapports/rapportfinal.pdf

Chevalier-Coyot M., Houchot A., Matringe G., Valadas M., Weinland K. (2006). *Programmes personnalisés de reussite éducative.* Rapport de l'Inspection générale à Monsieur le ministre de l'Education nationale, de l'enseignement supérieur et de la Recherche. Rapport n°2005-048 juin 2006, pdf 51 pages
http://lesrapports.ladocumentationfrancaise.fr/cgi-bin/brp/telestats.cgi?brp_ref=064000688&brp_file=0000.pdf

Commission Européenne (2006) JO L 394/ 2006/962/CE Journal Officiel de l'Union Européenne. 18 décembre 2006. *Recommandation du parlement européen et du conseil sur les compétences clés pour l'éducation et la formation tout au long de la vie.* Bruxelles. Décembre 2006
http://eur-lex.europa.eu/LexUriServ/site/fr/oj/2006/l_394/l_39420061230fr00100018.pdf

Conseil supérieur de l'éducation du Québec (2007). *Soutenir l'appropriation des compétences transversales et des domaines généraux de formation. Avis au ministre de l'éducation, du loisir et du sport.* Gouvernement du Québec.
http://www.cse.gouv.qc.ca/fichiers/documents/publications/Avis/50-0453.pdf

Council of the european education (2006) *Education, youth and culture. Key competences for lifelong learning.* Brussels. May 2006. http://www.Consilium.europa.eu/

Dubet F. (1999) *Le collège de l'an 2000.* Rapport à la Ministre déléguée chargée de l'enseignement scolaire. Paris: La Documentation française.
http://lesrapports.ladocumentationfrancaise.fr/BRP/994001548/0000.pdf

Dutercq Y & Derouet J-L. (2004) *Le collège en chantier,* Lyon: INRP.

Ferry L. (1995). Qu'apprendre au collège ? *Le débat, 87.* 147-180.

DeSeCo (2002) *Définition et sélection des compétences : fondements théoriques et conceptuels.* CERI. OECD. Novembre 2002. http://www.oecd.org/edu/statistics/deseco

Houchot A. Robine F. & al. (2007). *Les livrets de compétences : nouveaux outils pour l'évaluation des acquis.* Rapport de l'Inspection générale à monsieur le ministre de l'Education nationale.
Rapport n° 2005-048 juin 2007, pdf 60 pages
http://media.education.gouv.fr/file/50/0/6500.pdf

Jonnaert P., Barrette J., Masciotra D., Yaya M. (2006). *La compétence comme organisateur des programmes de formation revisitée ou la nécessité de passer de ce concept à celui de l'agir compétent.* Publication de l'Oré, Montréal.

Lepetit P., Lesné J.-F., Bardi A.-M., Pecker A., Bassy A.-M. (2007). *Rapport sur la contribution des nouvelles technologies à la modernisation du système éducatif,* Mission d'audit de modernisation, Inspection générale des finances.
http://www.audits.performance-publique.gouv.fr/bib_res/665.pdf

MEN (2006) *Le socle commun de connaissances et de compétences.* Paris. SCEREN. http://media.education.gouv.fr/file/46/7/5467.pdf

MEN (2007). Livret de connaisances et de compétences. Grilles de références. http://eduscol.education.fr/D0231/experimentation_livret.htm

UNESCO (2005) *Vers les Sociétés du Savoir.* Rapport Mondial. Editions UNESCO. http://unesdoc.unesco.org/images/0014/001419/141907f.pdf

Citizens' competences and education for the 21st century
Working and assessing competences in the Spanish education system

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Providing students with the key competences demanded by the knowledge society

An individual is deemed to have achieved competence (from the Latin *competentia*) when he or she is *"capable, able to do something"* (DRAE, 2001) or is *"competent: having adequate ability"* (Webster Dictionary, 1993). This old Latin meaning of competence was soon incorporated into the world of work, which traditionally demanded that artisans and farmers were skilled craftsmen or had acquired practical abilities or *know-how*. More recently, society has come to demand of its workers manual or intellectual skills that allowed them *to do* a certain type of work well.

But the concept of competence, understood as *the ability to do something (well)*, is not exclusive to the world of work or, at least, not to manual work. The term competent is used for all kinds of activities: technical, business, relating to services, industrial, agrarian, artistic, etc. Society has long recognised the need for *competent* citizens, but not only in their strictly work-related tasks.

The demand for competences has evolved rapidly since the second half of the 20th century. Whilst the demand for manual skills (routine and non-routine) and routine cognitive skills has fallen, there has been a notable increase in the demand for not only cognitive competences but all kinds of analytical and interactive competences (Levy and Murnane, 2004).

The term *competence*, and above all *key competence*, has firmly integrated itself into the area of education in recent years. This integration has been supported by scholars and collectives through their reflective thoughts and conceptual contributions: Van der Heidjen et Barbier, 1999; Marchesi et al, 2007; Coll, 2007) and by official bodies and institutions with specific proposals concerning the learning that is deemed essential for young people to achieve full citizenship, and allows them to live together in freedom and to exercise their individual and collective rights and shared responsibilities in a responsible and caring manner (Delors, 1996).

The introduction of competences into the Spanish education system has been particularly influenced by the work of the OECD on the definition and selection of competencies (OECD, 2002) and the work of the European Union, formulated in this case within the framework of the Lisbon strategy (Lisbon Extraordinary European Council, 23–24 March 2000) and the framework agreement on the 2010 objectives of education (EU, 2003), which resulted in the establishment of the key competencies (EU, 2005). The Barcelona

European Council in 2002 underlined the need to improve the mastery of the key competences and adopted a resolution on lifelong learning (EU, 2002).

Both contributions have taken place in close relationship with the complex and ambitious programme of evaluation undertaken since the final years of the 20th century, designed to assess the key competences achieved by young people and, more recently, citizens as a whole. In these assessment programmes, the OECD and the EU have been accompanied by the rest of the international bodies and institutions that carry out evaluations: UNESCO, OEI, IEA, etc.

The project called *Definition and Selection of key competences* (OECD, 2005) was initiated with the aim of providing international assessments, in particular the PISA study launched in the middle of the nineties, with a conceptual framework for defining the key competences and the assessment of the learning educational outcomes for each student. DeSeCo defines competence as the ability to tackle complex mental tasks that involves the mobilisation of practical skills, knowledge, and other psychosocial resources such as motivation, values, attitudes, and tensions in order to achieve an effective result. A competence constitutes a "know-how" (applied knowledge) that can be adapted to varying contexts and can combine in varying degrees with other competences.

The objectives of education for 2010 were agreed on within the framework of the Lisbon strategy, which set out the aims of the European Union to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion. In accordance with these plans and in order to contribute to the achievement of the educational objectives, the European Council and Parliament recommended the introduction of key competences for lifelong learning (EU, 2006).

The recommendations of the EU define competences as a combination of knowledge, skills and attitudes appropriate to the context and to the willingness to learn. Key competences are those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment. By the end of compulsory education or vocational training young people should have developed the key competences to a level that equips them for adult life and forms a basis for lifelong learning.

The Spanish education system wanted to adapt its actions to the educational challenges of the knowledge society and to achieve the educational aims shared by the countries of the European Union. For this reason, and following the recommendations of the Parliament and the Council, the new Organic Law on Education (LOE-2/2006) has incorporated the key competences into the curriculum so that students achieve them by the end of compulsory education.

Furthermore, the LOE has established the diagnostic assessments of the key competences acquired by students by the end of the fourth year of primary education (9–10 years) and

the second year of compulsory secondary education (13–14 years). The law also requires teachers to take into consideration the degree of acquisition of the key competences when a decision is taken about whether students can progress to the next stage or cycle of education, or their qualifications at the end of compulsory secondary education.

Finally, the organisational measures of the schools, the collective decision-making by the teaching staff, the participation of the educational community as a whole (teachers, parents, students and local community), all within the framework of a determined and renewed autonomy and shared responsibility, should be aimed at all the students achieving success at the end of compulsory education. Success in external assessments is measured by the degree of acquisition of the key competences and, therefore, these assessments are also of fundamental importance to the educational action as a whole.

Key competences in the Spanish curriculum

The incorporation of the key competences into the curriculum, together with the objectives, contents and assessment criteria, has several purposes: firstly, the integration of both formal learning, in the different areas and subjects, and non-formal learning; secondly, that students can use their learning effectively in different situations and contexts, whenever it is needed. Students should be able to achieve personal fulfilment, become active citizens, participate fully in adult life, and undertake lifelong learning. Lastly, the key competences can provide guidance on the teaching methods in order to identify the contents and the assessment criteria of an essential nature, and inform the decision-making in both the teaching and learning processes.

This incorporation of the key competences into the curriculum does not mean a rejection of the very important advances made in Spanish education since the seventies (LGE, 1970), concerned with defining the objectives of education, or since the nineties (LOGSE, 1990), concerned with defining the new curriculum in terms of objectives, contents (concepts, procedures and attitudes) and assessment criteria.

The key competences are not going to replace any of the above elements or areas of the curriculum, but rather give coherence to the whole, adding to the teaching perspective this concern that, by the end of the learning process, students can apply the learning in different situations and contexts and are able to deal with the different circumstances of academic, social and working life. As proposed by the report to UNESCO of the International Commission on Education for the twenty-first century (Delors, 1996), it is not only a matter of students learning to know, but also learning to do, learning to be and learning to live together, that is, when they finish compulsory education, they are well prepared for active citizenship.

The LOE entrusts the Government to establish the objectives, key competences, contents and assessment criteria of the basic aspects of the curriculum. The Ministry of Education

and Science establishes 65% of the curriculum for the whole State and the Autonomous Communities the remaining 35% (except in the cases of Autonomous Communities with a co-official language whose responsibility is increased to 45%). The development of the Law (MEC) has defined, in both the curriculum for primary and secondary education, the key competences that a student must acquire in order to manage themselves personally, emotionally and professionally by the end of both educational stages.

The key competences are described in the curricula of the two educational stages; the way in which each area contributes to their development is pointed out in both stages. Although the different areas and subjects contribute to the acquisition of the key competences, there is not a one-to-one correspondence between a particular area or subject and the acquisition of a specific key competence, but rather the work in each area or subject should contribute in varying degrees to the acquisition of all the competences.

The eight key competences that have been identified in the Spanish curriculum are described below. In accordance with the proposal of the European Union, the key competences have been adapted to the reality of the Spanish education system with its specific needs and circumstances. In addition, the Spanish proposal is similar to that drawn up by other countries such as France. In accordance with the above points, the description, purpose and the distinctive aspects of these eight key competences have been included in the regulations that set out the core curriculum for the whole State, both in primary and compulsory secondary education (MEC, 2006a, b).

Furthermore, in addition to the description of each one of the key competences, the regulations establish the principal relationships between each competence and each of the areas and subjects in the curriculum, and how each of them contributes to the acquisition of the different competences. The paragraphs below give a quite detailed description of the competence in linguistic communication and, in order not to overburden this summary, a more succinct description of the statutory provisions on the other seven competences in the basic regulations, to which the reader is invited to refer. Although all the areas and subjects contribute to the acquisition and development of the different competences, the intensity of the contribution is somewhat different. The section on general diagnostic assessment includes some tables in which the people responsible for the assessment have tried to reflect the intensity of the relationship between the different areas and subjects and the key competences.

1. **Competence in linguistic communication** refers to the use of language as a tool for oral and written communication, for representing, interpreting and understanding reality, for constructing and communicating knowledge, and for organising and self-regulating thought, emotions and behaviour.

   This competence includes reading comprehension but a broader plan is formulated in the Spanish curriculum. Thus, it should be noted that reading has become an important factor in developing the key competences, and for this reason schools are urged to or-

ganise the teaching in such a way that a period of not less than thirty minutes a week is devoted to reading in the classroom in each and every year of primary and secondary education.

As the curriculum for *Spanish (Lengua Castellana y Literatura)* was conceived to place emphasis on the social use of the language in different communicative contexts, it is self-evident that it contributes directly to the development of all aspects of the competence in linguistic communication. Learning a *foreign language* based on the development of communication skills, contributes to the development of this key competence in the same way as the first language and, in addition, perfects, enriches and fills this general communicative competence with a better understanding of the subtleties of language. Learning *classical languages* makes it possible to have a greater understanding of the functional grammar of European languages derived from Romance languages and of others that have received an important lexical contribution from these languages.

Knowledge of the natural, social and cultural environment, education for citizenship and physical education, like the rest of the areas and subjects in the curriculum, contribute to improving knowledge of specific vocabulary, conceptual understanding, capacity for analysis, reflective attitude and assessment: that is, a large part of the cognitive processes that characterize this competence.

Some areas incorporate specific elements. For example, *art education* contributes to improving communicative interchanges that require a combination of skills related to speech, such as breathing, pronunciation and articulation.

Maths, on the one hand, incorporates the essentials of mathematical language and, on the other, activates the verbal description of the processes and reasoning, and creates a favourable atmosphere for listening to the explanations of others, which helps to improve understanding, critical analysis and communication skills. *Information and Communication Technology* helps to deal with a variety of communicative and informative situations and reinforces reading skills.

2. **Mathematical competence** consists of the ability to use and to relate numbers, their basic operations, symbols, and mathematical forms of expression and reasoning, both to produce and to interpret different types of information and to broaden knowledge on the spatial and quantitative aspects of reality, and to resolve a range of problems related to everyday life and to the world of work.

3. **Competence in knowledge of and interaction with the physical world** deals with the ability to interact with the physical world, both in its natural aspects and in those caused by human activity, in such a way that it is possible to understand events, predict consequences and undertake activities aimed at improving and protecting the conditions for one's own life, the lives of others and all living creatures. It includes skills in order to manage oneself appropriately, with autonomy and personal initiative, in very

diverse spheres of life and knowledge (health, productive activity, consumption, science, technological processes, etc.), and to understand the world, which requires the application of concepts and basic principles that allow the phenomena to be analysed from the different fields of scientific knowledge involved.

4. **Information processing and digital competence** consists in having skills to search, collect, process and communicate information, in order to transform it into knowledge. It incorporates different skills, from accessing information to transmitting it on different supports after processing, including the use of information and communication technologies as an essential element for obtaining information, learning and communicating.

5. **Social and civic competence** makes it possible to understand the social reality in which one lives, and to cooperate, live together and exercise democratic citizenship in a plural society, and to make a commitment to contribute to its improvement. The complex skills and diverse knowledge integrated into this competence enable citizens to participate, take decisions, choose how to behave in certain situations, and take responsibility for their choices and decisions.

6. **Cultural and artistic competence** assumes knowledge, understanding, appreciation and critical assessment of different cultural and artistic works that can be used as a source of enjoyment and enrichment, and awareness of their cultural heritage and place in the world.

7. **Learning to learn** comprises the acquisition of the skills that are necessary for further learning, the ability to persevere with and effectively manage the learning process according to one's objectives and needs.

8. **Autonomy and personal initiative** refers, on the one hand, to developing awareness and applying a set of interrelated personal values and attitudes, such as responsibility, perseverance, self-knowledge and self-esteem, creativity, self-criticism, self-control, the ability to make choices, calculate risks and resolve problems, as well as the ability to put off the need for immediate satisfaction, to learn from mistakes and to accept risks.

These key competences are not independent of one another; the acquisition, development and use of each one of them requires in turn the others. In some cases this relationship is especially intense. Thus, for example, some essential elements of the competences in linguistic communication, learning to learn and information processing and digital competence, which are closely related to one another, form the basis for developing and using the rest of the competences.

Assessment of the key competences: information on the results, guidelines for the work of the teachers

Three different areas of assessment have influenced and are going to have an even more profound influence on the incorporation of the competences into Spanish education: the international assessments in which Spain participates, particularly those developed since the nineties, the diagnostic assessments established in our new legislation and the continuous assessments performed by teachers as a way of judging a student's qualifications and whether they can progress to the next year. These three types of assessment processes provide essential information in order to verify a student's level of acquisition of the key competences.

In the external assessments of student performance, the decisions on what to assess, that is all the aspects (dimensions, scales, levels of performance, etc.) of each competence that are to be assessed, provide teachers with some very valuable indications regarding the importance and weighting given to each one of these aspects by the experts in charge of the assessments. In the case of the international assessments, the agreement on the approach, and on the development and analysis of their results, carried out by the most renowned international experts, can convert the messages of the assessment into sound guidelines on the teaching of the key competences.

International assessments

Spain continues to participate in the international assessment projects of the IEA and the OECD, and also in the most recent EU projects. The principal objects of assessment in these projects are the following three key competences: reading comprehension (PISA and PIRLS), maths and science (PISA and TIMMS). The assessment frameworks (OECD, 2006; Mullis et al, 2006; Mullis et al, 2005) in relation to these three competences provide a detailed map of contexts, cognitive processes, contents and, on occasions, the attitudes that characterize each one of these competences and that, therefore, are evaluated. Three new competences have recently been added to these assessments: civic and citizenship competence, the ICCS of the IEA (2006), with a specific European module, competence in and familiarity with ICT, PISA – ERA of the OECD (2009), and competence in learning to learn (EU, 2007).

This international panorama of assessment of the above six key competences can be used to inform and help set in motion the Spanish diagnostic assessments. But moreover, and we believe this to be of the greatest importance, it offers a very valuable guide for teachers. For this reason, the Spanish Institute of Evaluation has published the frameworks and the released questions of the reading comprehension assessments in PISA 2000, 2003 and 2006 (IE, 2008).

Diagnostic assessments in Spain

In Spain, the LOE has established two distinct, but complementary, processes for the assessment of key competences: general diagnostic assessments and the diagnostic assessments that will be carried out by all schools on the key competences achieved by their students.

The general diagnostic assessments should provide information on the functioning of the education system as a whole. The level of acquisition of the key competences achieved by students in the fourth year of primary education (9-10 years) and the second year of compulsory secondary education (13-14 years) will be assessed by applying external tests to a representative student sample of each one of the Autonomous Communities and of the entire State.

These general diagnostic assessments will be carried out with the participation of the Autonomous Communities. The Institute of Evaluation and the corresponding bodies of the education authorities have already started these assessments. The first step has been to design the framework of the assessment and to prepare a pilot test for four key competences (competence in linguistic communication, mathematical competence, competence in knowledge of and interaction with the physical world, and social and civic competence). The field work was carried out from the end of April to mid-May. In the academic year 2008-2009, the first general diagnostic assessment will be carried out with the fourth year of primary education, and in the year 2009-2010 it will start with the second year of compulsory secondary education.

As shown above, the general diagnostic assessments can provide valuable information on all the aspects they touch on: the *relationships between competences and areas* and subjects, the *dimensions* or different aspects of the competences, the *levels* of acquisition of the competences by the students, the *questions used* to assess the different competences, the circumstances and the contexts of the learning and the results.

Within the framework of the assessment, the following tables of connections among the different areas of the curriculum and the competences have been prepared as references for the assessment of the key competences, as they highlight the intensity of the relationship between the competences and the areas and subjects[1].

[1] The intensity of the relationship between the competence and each area and subject is measured from more to less with ●●, ● y □.

Primary Education

Competences	No.	Knowledge of the Environment	Art Education	Physical Education	Official Languages	Foreign Language	Maths	Citizenship
	1	●●	●	□	●●	●●	□	●
	2	●	●	□	□	□	●●	□
	3	●●	●	●	□	□	●	□
	4	●	●	□	●	●	●	□
	5	●●	●	●	●	●	□	●●
	6	●	●●	□	●	●	□	●
	7	●●	●	●	●●	●●	●●	□
	8	●	●	●	●	●	□	●

Compulsory Secondary Education

Competences	No.	Natural Sciences	Physical Education	Social Sciences Geography and History	Official Languages	Foreign Language	Maths	Plastic and Visual Education	Music	Technology	Citizenship
	1	●	□	●	●●	●●	□	□	□	□	□
	2	●	□	●	□	□	●●	●	□	●	□
	3	●●	□	●●	□	□	●	□	□	●●	●
	4	●	□	●	●●	●	●	□	□	●●	□
	5	□	●	●●	●	●	□	□	□	□	●●
	6	□	□	●●	●	●	□	●●	●●	□	□
	7	●●	□	●●	●●	●●	●●	□	□	□	□
	8	□	●	●	●	●	●	□	□	●	●

With respect to the dimensions of the competences, the summary below is provided as an example of the dimensions that refer to *the processes of the competence* and *blocks of content.*

Competence	**Processes**	**Blocks of content**
Competence in linguistic communication	Comprehension (oral and reading): • Approximation and identification • Organisation • Integration and synthesis • Reflective thought and evaluation • Transference and application	Semantic relationships Knowledge of grammar Headings and texts Contextual elements Lexical items or vocabulary
	Expression (written): • Planning • Contextualisation - Coherence - Cohesion - Appropriateness • Revision and presentation	Lexical items or vocabulary Knowledge of grammar Headings and texts Handwriting and spelling
Mathematical competence	Reproduction: • Access and identification • Comprehension Connection: • Application • Analysis and assessment Reflective thought: • Synthesis and creativity • Judgement and assessment	4th Year Primary: • Numbers and operations • Measurement: estimation and calculation of magnitudes • Geometry • Information processing, chance and probability 2nd Year Compulsory Secondary Ed.: • Common contents • Numbers • Algebra • Geometry • Functions and graphs • Statistics and probability
Competence in knowledge of and interaction with the physical world	Identifying scientific topics Explaining scientifically phenomena of the physical world Using scientific tests	Knowledge of the natural world: • Matter and energy • Living creatures • The environment and its conservation • The earth and the universe • Science, technology and society Knowledge about interaction with the physical world: • Scientific research • Scientific explanations
Social and civil competence	Using information: • Obtaining • Analysing • Synthesizing Understanding social facts: • Explaining • Empathising • Interpreting Living together in society: • Negotiating • Discussing • Participating	People and social structures • Individual • Society • Social structure Evolution and development of societies • Past • Present • Democratic systems • Human rights

Furthermore, within the framework of the assessment, a primary approach to the relationships between the processes and the blocks of contents of each one of the competences has been established through the assessment criteria for the different areas of the curriculum that contribute to its acquisition.

This relationship between the processes and the blocks of contents through the assessment criteria for the different areas offers valuable guidance to the people responsible for preparing the tests. Each one of the assessment criteria for the different areas and subjects can suggest one or more units of assessment (comprised of a stimulus and several questions) which, in turn, address the cognitive process and the corresponding block of knowledge.

Blocks of contents	Processes		
	a	b	C
A	Assessment criteria areas/subjects	Assessment criteria	Criteria
B	Criteria	Criteria	
C			Criteria
…	…		

This same information can inform the work of the teachers, who can see the relationship between the different dimensions of the competence and the assessment criteria for the area or subject they have to teach.

The information on the results will provide, in each case, the units of assessment and the proposed items. These units of assessment will gradually build up into a "question bank" which, as long as the formulation is correct, will provide teachers with a practical example of the dimensions of the competence that can be worked on in the classroom.

Blocks of contents	Processes			Weighting %
	a	b	c	
A	Unit 1		Unit	
B		Unit		
C			Unit	
…				…
Weighting %				

The results of the assessment will also allow information to be provided on the level of competence acquired by the students. These levels of competence may be a useful benchmark for the work of the teacher, both for teaching and measuring the progress of their students.

As pointed out above, the assessment of the students' level of acquisition of the key competences should be carried out taking into account the family background of the students and the social context of the schools, in which the learning outcomes are produced, so that the results can be understood. A comparison of results can only be made within a contextual framework that contributes to explaining the differences.

For this reason, context questionnaires have been prepared for teachers, school management teams, students and families so that a socioeconomic and cultural register of the students and the educational institutions can be drawn up to provide information on the variable resources and educational processes together with the context variables that contribute to explain the results.

The general diagnostic assessments of the Spanish education system must lead to a commitment to review and improve the education, on the basis of their results, contribute to improving the quality of and the equity in education, inform the educational policies, increase the transparency and the efficiency of the education system and provide information on the degree of acquisition of the key competences.

The diagnostic assessments that all schools will carry out on the key competences acquired by their students will be organised by and under the responsibility of the corresponding Autonomous Communities and will be of an internal, formative and general advisory nature for schools and informative in nature for families and the educational community. The development and control of these assessments corresponds, therefore, to the education authorities, who must provide the necessary models and support to ensure that all schools can carry them out adequately.

These diagnostic assessments based on census data are also aimed at students in the 4th year of primary education (9-10 years) and the 2nd year of compulsory secondary education (13-14 years) and the frame of reference will be the general diagnostic assessments.

Decisions about advancement and qualifications of the students

At the end of each academic year, cycle or stage of education, the teachers and the teaching staff are responsible for deciding whether students can progress to the next year (or be awarded a qualification at the end of compulsory secondary education). The LOE provides that these decisions must take into account the corresponding levels of competence achieved by a student.

In accordance with the new regulations, students in primary education will progress to the next cycle or stage as long as they have acquired the key competences corresponding to their level of maturity. If a student has not achieved these key competences, he or she can remain another year in the same cycle of primary education, but this measure must be of a clearly extraordinary nature. The objective is to ensure that no student finds him or herself in this situation and this decision can only be adopted when all the necessary resources and remedial support put into operation have proved to be insufficient. The transition to secondary education requires coordination between the two educational stages and thus at the end of primary education the class teacher must prepare a personal report on the learning achieved by the student based on the objectives and the key competences.

A similar reasoning is applied in compulsory secondary education regarding advancement to the following academic year and the qualifications awarded in this stage. As stated in the preceding pages, both the national and the international external assessments provide teachers with examples that are undoubtedly useful when they have to take these decisions.

The challenge for teachers: how to work on and how to assess the competences

Society, education systems, families and students themselves demand solutions from teachers to social and educational challenges: the problems generated by the universalization of education, the heterogeneity of students from very diverse cultures, family backgrounds and social contexts, the complexity of the relationship between young people and adults in family, school and social life, education for global citizenship, equality, the environment, security, etc.

The role of the teacher has been valued and respected and their authority is not questioned. Nowadays, new models of relationships have appeared that are more participative and more complex, and also, in turn, new types of conflicts in school harmony that demand new strategies and skills from teachers in order to resolve them peacefully and decisively through communication and participation.

Moreover, teachers are being asked to renew their working methods and assessment systems, so that they fit in with the objective that all students acquire the key competences.

While the introduction of the key competences poses educational challenges, it can be said that teachers face the most complex and delicate task: teaching, educating and working so that students acquire these competences, in spite of the small support for this task from educational research.

Undoubtedly, future teachers will shortly be provided with the new initial training programmes that will guide them in this task. In fact, the European Union and the UNESCO are determined to improve teachers' qualifications. The Spanish Ministry of Education, Social Policy and Sport, sensitive to the new training needs of teachers, has already adopted (MEC, 2007) the new regulations in this regard, which set out the basic guidelines for universities on the development of study programmes in accordance with the Bologna process. In particular, it establishes that the objectives of the university degrees for future teachers should focus on the acquisition of the necessary abilities so that they can teach their students in terms of key competences.

On the other hand, practising teachers need continuous professional development programmes and the assistance of academic thought on the theoretical and methodological aspects of the teaching work aimed at the key competences to be acquired by students.

But, there is no time to lose: teachers have to work with their students, gradually incorporating the theory and practical experience at the same time. It would thus seem opportune that they can count on the assistance of the external assessments and their experience.

The development of a key competence does not so much consist in teachers introducing fundamental modifications to the methodology or reformulating the objectives and contents of the area or subject, as in adding a new sensibility and perspective to the day-to-day work. The objective is to show this concern and to incorporate it into the classroom planning so that the students are able, at the end of the learning in each area or subject, to use what they have learnt in an active way when faced with new contexts, situations and problems. Exercises should be introduced into the day-to-day classroom activity to verify the level of acquisition of the competences (external assessments could be particularly useful here).

However, the competences should not only be worked on from within the curriculum. In order for all students to be in a position to acquire the key competences, educational institutions have to carry out organisational proposals to facilitate their development. Thus, the effective teaching of the curriculum, the organisation and running of the educational institutions, the teaching activities as well as the after school and complementary activities, and the ways in which the different components of the educational community relate to one another should contribute to the achievement of the key competences.

One of the principal new challenges that teachers also have to deal with is the assessment of the key competences acquired by a student in order to decide whether he or she can progress to the next year or the qualification to be awarded to a student. In this matter, collective decision-making, with which Spanish teachers are already accustomed, is of paramount importance. Whether a student has achieved an adequate level of competence or not to advance to the next year or to be awarded a qualification can only be decided collectively by the teachers. Although this decision is dependent upon a student's performance in each area or subject, it should transcend the individual assessment of each teacher. Once again in the assessment, teachers can rely on the guidance provided by the external assessments.

In this task, which is so complex and promising, teachers should be able to count on the efforts of all the institutions concerned with education as well as the involvement and understanding of the educational community and society as a whole.

References

Coll, C. (2007) *Las competencias básicas en educación*. Madrid: Alianza.

Delors, J. (Dir) (1996). *La educación encierra un Tesoro: Informe a la UNESCO de la Comisión Internacional sobre educación para el siglo veintiuno.* París: Organización de las Naciones Unidas.

EU (2003). Education and Training 2010: The success of the Lisbon Strategy hinges on urgent reforms: Draft interim report on the implementation of the detailed work programme on the follow-up of the objectives of education and training systems in Europe. Brussels: COM (2003) 685 final. [SEC (2003) 1250].

EU (2005). Recommendation of the European Parlament and of the Council on key competences for lifelong learning. Brussels: COM (2005) 548 final.

EU (2006). Recommendation of the European Parlament and of the Council of 18 December 2006 on key competences for lifelong learning. (2006/962/CE). *Official Journal of the European Union*, 394, 10-18.

EURYDICE (2002). *Las competencias clave. Un concepto en expansión dentro de la Educación Secundaria Obligatoria.* Madrid: Secretaría General de Educación y Formación Profesional (MEC).

Van der Heidjen, b. et Barbier, g. (1999): "La compétence, sa nature et son développement". *Education Permanente*. 141, 119-137.

Levy, F. & Murnane, R. (2004): *The New Division of Labor.* Princeton: Princeton University Press.

LOE (2006). Ley Orgánica 2/2006, de 3 de mayo de Educación. *Boletín Oficial del Estado*, 106, 17158-17207.

Marchesi, A. (2007). *Sobre el bienestar de los docentes: Competencias, emociones y valores.* Madrid: Alianza.

MEC (2004). Ministerio de Educación y Ciencia. *Una educación de calidad para todos y entre todos. Propuestas para el debate.* Madrid: Secretaría General de Educación.

MEC (2006 a). Ministerio de Educación y Ciencia. Real Decreto 1631/2006, de 29 de diciembre, por el que se establecen las enseñanzas mínimas correspondientes a la Educación Secundaria Obligatoria. *Boletín oficial del Estado*, 5, 677-773.

MEC (2006 b). Ministerio de Educación y Ciencia. Real Decreto 1513/2006, de 7 de diciembre, por el que se establecen las enseñanzas mínimas de la Educación Primaria. *Boletín oficial del Estado*, 293, 43053-43102.

MEC (2007 a). Ministerio de Educación y Ciencia. I*nforme 2006: Objetivos Educativos y Puntos de Referencia 2010.* Madrid: Secretaría General Técnica.

MEC (2007 b). Ministerio de Educación y Ciencia. Orden ECI/3857/2007, de 27 de diciembre, por la que se establecen los requisitos para la verificación de los títulos universitarios oficiales que habiliten para el ejercicio de la profesión de Maestro en Educación Primaria. *Boletín oficial del Estado*, 312, 53747-53750.

MEC (2007 c). Ministerio de Educación y Ciencia. Instituto de Evaluación. PIRLS 2006: *Estudio Internacional de Progreso en Comprensión Lectora de la IEA: Informe Español.* Madrid: Secretaría General Técnica. Subdirección General de Información y Publicaciones.

MEC (2008 a). Ministerio de Educación y Ciencia. Instituto de Evaluación. *La Lectura en PISA 2000, 2003 y 2006. Marco y pruebas de la Evaluación.* Madrid: Secretaría General Técnica. Subdirección General de Información y Publicaciones.

Merriam-Webster´s (2000). Collegiate Dictionary (10th Ed.). United States of America.

Ministère de l'Éducation Nationale, de l´Enseignement Supérieur et de la Recherche. Délégation a la communication (2006). *Le socle commun des connaissances et des compétences.* Francia : Direction générale de l'enseignement scolaire.

Ministère de l'Éducation Nationale, de l'Enseignement Supérieur et de la Recherche (2007). Décret no 2007-860 du 14 mai 2007 relatif au livret personnel de compétences. *Journal officiel de la république française,* 64 sur 311.

Ministère de l'Éducation Nationale, de l'Enseignement Supérieur et de la Recherche (2007). Arrêté du 14 mai 2007 relatif au livret personnel de compétences. *Journal officiel de la république française,* 74 sur 311.

Mullis, I.V.S., Martin, M. O., Ruddock, G. J., O'Sullivan, C. Y., Arora, A., & Eberber, E. (2005). *TIMSS 2007 Assessment Frameworks.* Boston: TIMSS & PIRLS International Study Center Boston College.

Mullis, I., Kennedy, A., Martin, M. & Sainsbury, M. (2006). *PIRLS 2006: Marcos teóricos y especificaciones de evaluación.* Madrid: Secretaría General Técnica. Subdirección General de Información y Publicaciones.

OECD (2002). *Conocimientos y aptitudes para la vida: Resultado de PISA 2000.* México: Santillana.

OECD (2005 a). *Informe PISA 2003: Aprender para el mundo del mañana.* Madrid: Santillana.

OECD (2005 b). *Definition and Selection of competences (DeSeCo): Theoretical and Conceptual Foundations: Strategy Paper.*

OECD (2008). *Informe PISA 2006: competencias científicas para un mundo del mañana.* Madrid: Santillana.

REAL ACADEMIA ESPAÑOLA (2001). *Diccionario de la Lengua Española (DRAE).* Madrid.

Rubio Carcedo, R y Fernández Martínez, A. (2005). *Evaluación Internacional de Matemáticas y Ciencias Segundo Informe de Resultados TIMSS 2003.* Euskadi: Instituto Vasco de Evaluación e Investigación Educativa.

Rychen, D.S. & Salganik, L.H. (2001). *Defining and Selecting key competences.* Seatle, Toronto, Bern, Göttingen: Hogrefe & Huber Publishers.

Rychen, D.S. & Salganik, L.H. (2003). *Key competences for a Successful Life and a Well-Functioning Society.* U.S.A. and Europe: Hogrefe & Huber Publishers.

Salganik, L.H., Rychen, D.S., Moser, U. & Konstant, J. W. (1999). *Projects on competences in the OECD Context Analysis of Theoretical and Conceptual Foundations.* Neuchâtel, Switzerland: Swiss Federal Statistical Office.

From the National Curriculum to Teaching Practice: "Unpacking" of key competences

— *Anna Valouchová and Jaroslav Faltýn*

Based on the *Framework Education Programme for Basic Education* and *key competences in Basic Education* (Handbook for teachers).

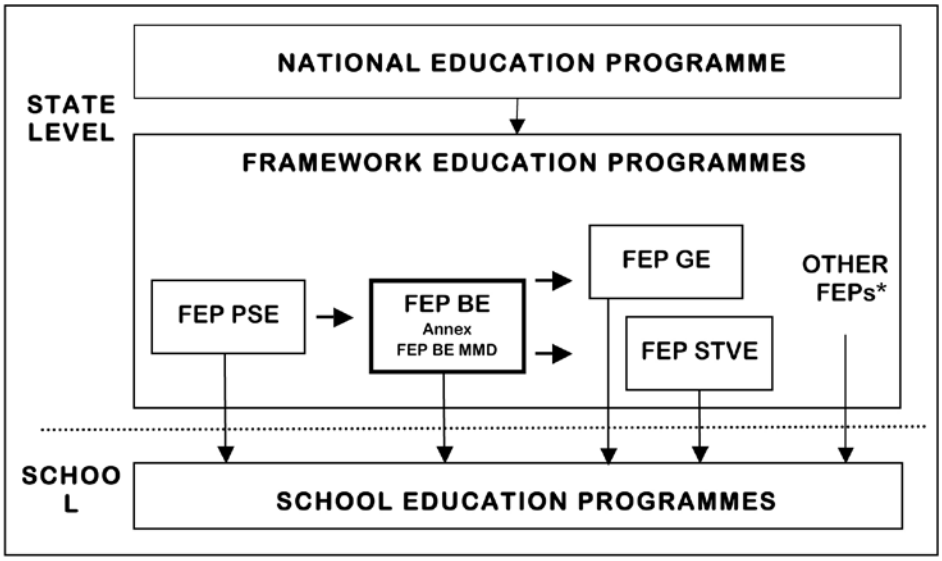
Main Characteristics of Basic Education in the Czech Republic

National Curriculum for Basic Education within the System of Curricular Documents

In line with the new curricular policy principles outlined in the National Education Development Programme for the Czech Republic ("White Book") and enshrined in the Education Act (on Pre-school, Basic, Secondary, Tertiary Professional and Other Education), a new curricular system for pupils and students from ages 3 to 19 is being introduced into the Czech education system. Curricular documents are developed at two levels: the **national level** and the **school level** (see Diagram 1).

The **national level** in the curricular documents system comprises the **National Education Programme** and the **National Curricula** (also called "Framework Education Programmes", FEPs). The National Education Programme defines initial education as a whole. The National Curricula define binding educational norms across various stages: pre-school education, basic education and secondary education. The school level consists of **School Curricula** (or "School Education Programmes", SEPs), forming the basis of education at the individual schools. School Curricula are developed by individual schools themselves, based on principles set out in the National Curriculum for the appropriate level. As a tool, the schools can use the Manual for Developing School Curriculum ("the Manual"), which exists for each level of the National Curriculum. The Manual contains instructions for the preparation of school education programmes as a whole, procedures for developing the various components of the school curriculum, and specific examples.

Diagram 1 – System of curricular documents



Captions: FEP PSE – Framework Education Programme for Pre-School Education; FEP BE – Framework Education Programme for Basic (i.e. primary and lower secondary) Education and Annex to the Framework Education Programme for Basic Education Specifying the Education of Pupils with Mild Mental Disabilities (FEP BE MMD); FEP GE – Education Framework for Secondary General Education (grammar schools); FEP STVE – Framework Education Programmes for Secondary Technical and Vocational Education.
* Other FEPs – additional framework education programmes defined by the Education Act - Framework Education Programme for Basic (i.e. primary and lower secondary) Artistic Schools, Framework Education Programme for Language Education and others.

The National Curricula:

- are based on a new education strategy, stressing key competences, their interlinking with educational contents and the application of acquired knowledge and skills in practical life;
- are based on the concept of life-long learning
- formulate the expected level of education that should have been attained by all students at the end of the respective educational stage
- promote the educational autonomy of schools as well as teachers' professional responsibility for the outcomes of the educational process.

The National Curriculum for Basic Education in its principles:

- follows up the National Curriculum for Pre-school Education and forms a basis for National Curricula for secondary education
- defines everything that is common to, and necessary within, the compulsory basic education system
- specifies the level of key competences that the pupils should have attained when finishing their basic education
- specifies the educational content - expected outcomes and subject matter
- specifies cross-curricular subjects with pronounced formative functions that should

be included as a mandatory component of basic education
- promotes a comprehensive approach to the implementation of the educational content, including the possibility of its interlinking as appropriate, and presumes choice from a variety of teaching procedures, different methods and formats of teaching suiting individual pupils' needs
- is binding for all secondary schools specifying their requirements for entrance procedures

Objectives of Basic Education

Basic education at **Stage 1** is conceived so as to facilitate pupils' transition from pre-school education and family care to compulsory, regular and systematic education patterns. It is based on learning, while respecting and developing each individual pupil's needs, skills and interests. Owing to its **activity-based** nature and use of appropriate methods, education motivates pupils to continue learning, leads them to become an active learner and to seek and discover suitable ways of solving problems.

Basic education at **Stage 2** helps pupils to acquire knowledge, skills and habits that will enable them to study independently and to respect citizens' rights. The scope and principle of Stage 2 of basic education builds on a broad development of pupils' interests, on pupils' higher-level learning potential, and on the interlinking of education and school life on one hand, and out-of-school life on the other. This makes it possible to use rather demanding work methods, along with new sources and ways of learning, to assign the pupils comprehensive and long-term tasks and to entrust them with quite a lot of responsibility in learning as well as in organizing school life.

Basic education should help pupils to **form, shape and gradually develop their key competences and provide them with solid fundamentals of general education** aimed mainly at situations that are close to their real life and at practical behaviour. Efforts are therefore made in basic education to meet the following goals:
- Create preconditions for pupils to acquire basic learning strategies and motivate them to life-long learning.
- Stimulate and encourage pupils to creative thinking, logical reasoning and problem solving.
- Get pupils to engage in efficient, effective and open communication.
- Develop pupils' abilities to cooperate and to value their own work and achievements as well as the work and achievements of others.
- Guide pupils so that they should become free and responsible individuals who exercise their rights and meet their obligations.
- Induce in pupils the urge to express positive feelings and emotions in their behaviour, actions, and when experiencing important situations in their lives; develop sensitivity and responsiveness towards other people, the environment and nature.
- Teach pupils to actively develop and protect their physical, mental and social health and to be responsible for it.

- Guide pupils towards tolerance and consideration for other people, respect for their culture and spiritual values; teach pupils to live together with others.
- Help pupils to discover and develop their own abilities and skills in the context of actual opportunities, and to use their abilities and skills in combination with their acquired knowledge when making decisions regarding the aims of their own life and profession.

Key competences in the National Curriculum for Basic Education

The Role of key competences within the Czech Curricular Reform

The pupils are expected to start using the acquired knowledge for independent reasoning, assessing and making decisions, interacting with others, working, and taking advantage of the learned knowledge at school. The world that the school should prepare them for will require extensive flexibility. The school cannot provide today's pupils with all the facts and information they will need in their future life, but it can help them develop skills and competences which will enable them to orient themselves in both work and personal life. Therefore it is necessary to move the spotlight from the facts to key competences which are more general and can be developed concurrently in all subjects and fields. In this way, the cross-subject approach to education is also strengthened. A person who has developed learning competencies will eventually be able to acquire all necessary knowledge even outside school.

The shift of focus in teaching practice from providing information **to developing key competences and achieving expected outcomes within subjects** requires that teachers become better acquainted with the new approaches to, and objectives of, their work. They need to become familiar with new teaching methods and strategies. The concept of **"unpacking of key competences"**, which will be presented below, is a possible way to approach the situation.

The Concept of key competences

Key competences represent the system of knowledge, skills, abilities, attitudes and values that are important to the individual's personal development and to the individual's role in society. The selection and concept of key competences are based on values that are generally accepted by society, and on generally shared ideas as to which competences of the individual contribute to his or her education, welfare and success in life, and to a strengthening of the functions of civil society.
The reason for and aim of education is to provide all pupils with a set of key competencies at a level they are able to attain, and in this manner to prepare them for their further education and their role in society. Acquiring key competences is a long-lasting and complex process which starts during pre-school education, continues during basic and secondary education, and takes its definite shape during subsequent life. While the level of key com-

petences that pupils attain by the end of basic education should not be regarded as the final level, the key competences acquired form an important basis for the pupil's life-long learning and his or her start in practical living and the labour market.
Key competences are not isolated phenomena, they are mutually linked and intertwined, multifunctional, have a cross-subject nature, and can only be acquired as a result of a comprehensive education process. **Therefore, their formation, shaping and development must be the ultimate aim of the complete educational content and of all of the activities taking place at school.**
In the National Curriculum for Basic Education, the subject matter of the educational content is understood as a means towards attaining activity-oriented expected outcomes which are gradually combined and interlinked during schooling and which, as a result, precondition an efficient and comprehensive use of acquired abilities and skills at the level of key competences. Key competences as itemized into individual points are not prescribed or presented to teachers as academic ideals, neither as innate qualities of a child, but as such personal and learning skills, knowledge, attitudes and values which can be **systematically developed** in any school subject or during any other activities at school.
The following competencies are regarded as key competences at the basic education stage:

- **Learning Competences;**
- **Problem-solving Competences;**
- **Communication Competences;**
- **Social and Personal Competences;**
- **Civic Competences;**
- **Professional Competences.**

In the National Curriculum, each competence is broken down into several specific points. For instance, one of the explicit aims defined by Learning Competences is:
"By the end of his or her basic education, the pupil:

- selects and uses suitable procedures, methods and strategies for efficient learning; plans, organizes and manages his or her own learning process; is willing to devote his or her time and efforts to additional study and life-long learning..." (For the complete itemization of Learning Competences see chapter 3.5).

Key competences and Educational Fields

The content of basic education within the National Curriculum is crudely divided into nine **educational areas.** Each educational area comprises one or more interlinked *educational fields:*

- **Language and Communication through Language** *(Czech language and Literature, Foreign Language)*
- **Mathematics and its Applications** *(Mathematics and its Applications)*
- **Information and Communication Technologies** *(Information and Communication Technologies)*
- **Humans and their World** *(Humans and their World)*

- **Humans and Society** *(History, Civic education)*
- **Humans and Nature** *(Physics, Chemistry, Nature, Geography)*
- **Arts and Culture** *(Music, Fine Art)*
- **Humans and Health** *(Health Education, Physical Education)*
- **Humans and the World of Work** *(The World of Work)*

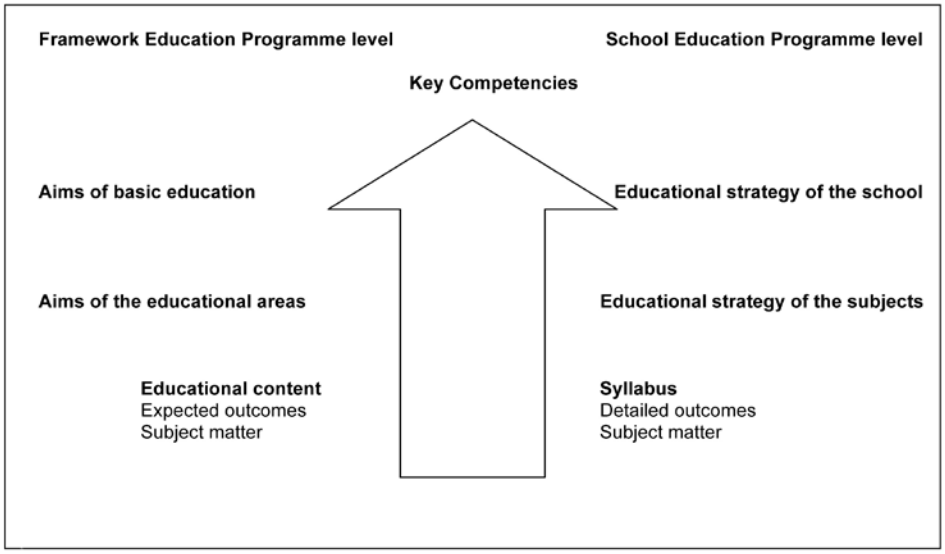
Each educational area is defined by an introductory **characteristic of the educational area,** which describes the content of each of the educational fields included in the educational area. The description is followed by the **aims of the educational area.** This section describes how the educational content guides the pupils to gradually acquire the key competences. Practical interlinking between the educational content and the key competences is provided by the fact that based on the aims of the educational area, the school defines (within the school curriculum) its educational strategy for the subjects taught - see Diagram 2.

The educational content of the educational fields comprises the expected outcomes and the subject matter. **Expected outcomes** are activity-driven, practically aimed, usable in common life and verifiable. They define the expected competences in applying acquired knowledge in practical situations and in common life. The National Curriculum for basic education identifies the expected outcomes at the end of *grade 3* (Period 1) as *tentative* (i.e., not binding), and at the end of *grade 5* (Period 2) *and grade 9* as *binding*.

The **subject matter** is structured within the National Curriculum for basic education into thematic areas (themes, activities) and is perceived as a *means to achieve the expected outcomes.* The subject matter, defined within the National Curriculum for basic education, is *recommended* to schools for distribution and further detailing for the individual grades or longer time segments. At the level of the school curriculum the agreed subject matter is binding.

The school will divide the educational content of each of the educational fields into **subjects** and, where appropriate, add subject matter to the detailed **syllabus** of a respective subject with respect to the pupils' needs, interests, inclination and talents so that *the development of the key competences is best pursued.* An educational field can comprise either one subject or multiple subjects; also, a subject can integrate the educational content of more than one educational field. The National Curriculum of basic education allows for *interlinking* of the educational content at the level of themes, thematic areas, or educational fields. The system is conceived so as to achieve a situation where the teachers would cooperate when setting up the school curriculum, *interlink* suitable themes which are common to the individual educational fields and *strengthen the cross-subject approach to education.*

Diagram 2 – The Way towards Pupils' key competences



From the National Curriculum to Teaching Practice: "Unpacking" of key competences

The National Curriculum for Basic Education, as described above, was approved in 2005 (The National Curriculum for Pre-school Education in 2004, and for Secondary Grammar schools in 2007). The schools then had two years to prepare their respective school curricula in accordance with the National Curriculum. In comparison with previous Curricula, a great deal of autonomy has been delegated to schools and teachers. The reform can also be characterized by an important shift from knowledge-based teaching to a competence-based approach. This means that there are quite substantial concepts that are new to many teachers. This is why there is currently a strong emphasis put on methodical support for teachers.

The Research Institute of Education in Prague (National Curriculum Institute for General Education) has proposed a handbook for the unpacking of key competences, to serve as an inspiration and tool for the teachers who are now expected to establish their own competence-based school curricula. This approach offers teachers a deeper insight into the objectives of the curricular reform, helps them understand the importance of key competences and suggests certain ways of working with key competences when outlining school curriculum, as well as in their teaching practice.

Working with key competences at the School Level

The National Curriculum requires that knowledge, skills, and attitudes are developed within an integrated system, rather than separately. Many schools and teachers may think

that working in this way is rather demanding and time consuming; but, they need to realize that through this approach, pupils will eventually acquire a complex set of knowledge, skills and attitudes - in other words, the key competences.

Currently, it is rather common that pupils do not apply the knowledge acquired in one subject in others, or in their daily lives. For instance, while a pupil's essays written for Czech language classes are usually spelled correctly, they can make quite a lot of mistakes when taking notes in Physics or when writing private letters. The reform strives to gradually improve this situation. Development of the key competences is thus understood as one of the main educational objectives. However, the National Curricula states that developing pupils' key competences should not happen at the expense of time necessary to provide them with knowledge. Time should be reserved to development of key competences, but this time needs to be used effectively.

The reform stresses that **the process of developing key competences should not be postponed until pupils have acquired all necessary knowledge**, but that both processes should progress concurrently. Modern psychology (see mainly Jean Piaget) has revealed that knowledge is best acquired through **complex and meaningful activity** performed by a pupil, not by memorizing or drilling.

Key competences are something that pupils develop and use in all subjects. Therefore, they can be perceived as certain universal qualifications: the ability to learn, communicate, cooperate, act democratically, solve problems, work towards a certain goal, etc.
Pupils make use of these competences or abilities in all subjects, as well in life outside school. The more often they have the opportunity to develop them, the higher level of competences they eventually attain. To attain certain competences means that a person can understand a situation s/he is facing, can react to it adequately, and can take a relevant standpoint.

Acquiring key competences is, of course, a gradual process. Even before the reform there were many teachers who tried to help pupils develop key competences, but from now on, all schools shall focus on this task systematically and intentionally.
It may appear that only some subjects are suitable for developing certain key competences, such as Civil Education for Civic Competencies. However, the opposite is true: the development of key competences can and **shall happen in all subjects**, even though the way to do so can be less obvious. For instance, Civic Competences can also be developed in Physics – even in this subject pupils can learn to cooperate, to respect others' opinions, to seek actively additional information, etc. What matters is the teacher's attitude and how he or she works with the pupils, and what skills and attitudes the teacher nurtures in them.

To summarize, we can argue that since the development of key competences is identified as one of the main educational objectives suggests that the reform has brought an important shift in the role and meaning of school subjects' content. To develop a syllabus no

longer means to simply make a list of topics to be addressed in the subject for a given year. Subject-specific knowledge still matters, but time also needs to be reserved for the systematic development of pupils‘ key competences. In other words, it is now schools‘ and teachers‘ task to **find a balance between the scope of knowledge the pupils will learn, and the level of skills they will reach, as well as the attitudes they will adopt.**
When teachers set up their own school curriculum, they must agree on how they interpret the description of individual key competences in the National Curriculum. This is essential for deciding what methods of presenting the subject matter to the pupils to choose, and for organizing and planning the activities for the school year. Some teachers believe that they progress too slowly if they do not focus solely on presenting facts to pupils, but is must be stressed that the time used for active development of pupils' key competences will be paid back abundantly when they start using the knowledge independently in their real life.

Definitions of key competences in the National Curricula - How to Approach them?

In the National Curricula, key competences are defined as a system of knowledge, skills and attitudes. In these documents, they are described at a rather general level. Teachers who are expected to work with these definitions need to first answer the following questions: *What exactly lies behind the definitions of key competences? Do I understand it in the same way as my colleagues at school do?*

Our experience has shown that a closer look at the definition of key competences, and search for common ground for working with them among school staff, makes the systematic and focused work with key competences a real part of teaching practice, and not just statements in school curriculum.

Discussions among teachers over each key competence leads to definitions of **specific activities** pupils should be able to perform when they have acquired a given competence. Consequently, teachers who have specified this and agreed on it have a much better idea of what, and how, they should teach, as well as what they should expect from their pupils. The teaching staff of a school should gradually come up with a complex answer to exactly what, and at what level of proficiency, pupils should master by the end of basic education (grade 9).

Analyzing and Unpacking key competences

What are the steps teachers should take when setting up their school curriculum? As suggested above, they first need to consider the meaning of the definition of the key competences in the National Curriculum. Based on their personal and professional experience, they should come to a consensus with their colleagues about what a pupil who has acquired certain competencies **can do**, what s/he **needs to remember**, and what **attitudes** s/he should **adopt**.

For example, in the National Curriculum for Basic education, under Civic Competences, one specific point is defined as follows:

By the end of his or her basic education, the pupil:

respects the beliefs of others; has respect for personal values of others; is able to empathize;

A possible way of analyzing, or "unpacking", this specific goal is presented below:

By the end of his or her basic education, the pupil:

- considers and assesses phenomena, processes, events and problems around from various perspectives;
- accepts the opinions or beliefs of others as one possibility; s/he presents his or her own opinion as one of the possible opinions, too; s/he uses appropriate arguments to support his/her opinion;
- expresses his or her own feelings; in various situations, does not hurt feelings of others;
- is critical towards stereotypes and prejudices in both private and public communication; tries to avoid them.

This example shows the level that a pupil should attain by the end of basic education. However, we should not forget that this level of competence can be attained only through a **long-lasting process**, and that the preceding stages need to be specified too. In the handbook for teachers, suggestions of how to unpack key competences were made at two levels: at the end of Stage 1 (i.e. grade 5) and at the end of Stage 2 (grade 9).

Let us look at an example showing how one of the specific aims of Learning Competences can be unpacked for the two levels.

In the National Curriculum for Basic Education, one of the specific points under the **Learning Competences** is:

By the end of his or her basic education, the pupil:

- *searches for and sorts out pieces of information, and based on their understanding, interlinking and systemization, uses them efficiently within the learning process, in creative activities and practical life;*

This definition can be unpacked for the two levels as follows:

	Grade 5	Grade 9
7	the pupil is able to produce, under the teacher's supervision, reasonably long notes on a text, e.g. from a textbook, and structure them correctly	the pupil makes notes individually, s/he can produce a text of a rather complex form and character (such as essay, review, project draft)

These descriptions are still rather general: topics or forms are not clearly outlined. And there is a good reason for this – it will be up to each teacher to specify these details because too much description would, limit their options, which is contrary to the desired goal.

Planning of Activity-Based Development of key competences

Key competences are not something that teachers can "tell" to pupils. Similarly to attitudes or physical abilities, key competences are shaped and formed through long-lasting processes, and therefore must be **practiced** consistently. That is why teachers need to prepare such situations and **activities** for pupils where they will have the opportunity to do so. Teachers also need to know what activities may be suitable for developing specific skills and competences, and they need to learn how to plan them for the duration of the pupils' schooling.

Every teacher needs to prepare such activities through which the pupils will be able to build up a certain skill. A detailed analysis of a key competence reveals **which activities may be relevant** to achieve the desired development of the key competence. The example above indicates that pupils will need enough time and opportunities to formulate and express their opinions, as well as enough space to listen to others' opinions. For it is in confrontation that pupils learn to respect others' beliefs and to support their statements with appropriate arguments. The teachers should therefore adopt such teaching strategies that will enable this to happen.

In the handbook, we have suggested a specification of the level of Communication Competencies achieved by the end of grade 5 as follows:

The pupil distinguishes whether s/he communicates with his/her peer or with an adult, with a friend or a stranger, and adapts the communication accordingly.

The teacher's goal is that the pupils learn to distinguish between different communication situations and partners, and to understand that they have to adapt communication means and strategies accordingly. They should therefore establish suggestions for **teaching strategies** they will use in order to achieve the desired goal. Here are some examples from the handbook:

- pupils need to experience situations at school when they speak not only to their peers or teachers, but also to elderly people, to strangers, officials etc;
- pupils need to practice how to compose and present a speech according to its intended objective and audience;
- pupils will encounter and become familiar with situations, formulations, various stylistic strategies and elements of body language which are used to show respect for others, and they will internalize their use – therefore they should analyze relevant texts, watch relevant videos, and discuss the strategies within the class;
- pupils need to realize how their verbal presentation is received by the audience – they should have the opportunity to receive feedback to their writing or speaking (e.g. receive an answer to the letter they have sent to the mayor).

Why is it necessary to go into such detail? Even though we think that everybody knows what "good communication" means, only when we start to unpack the individual key competences do we find out how different the understanding of these terms can be. Un-

packing of key competences is not an easy task, but it is worth the effort and time. During this process, the teaching staff of a school should **unify their ideas about what role the key competences play in the planning of teaching strategies**, because they will be educating **the same pupils**, and therefore their work should be coordinated and focused on the same goals.

Why Unify Ideas about Requirements towards Pupils? – Example of Professional Competences

One of the specific aims of Professional Competences is described in the National Curriculum for Basic Education as follows:

> *A pupil takes into account, in addition to the aspects of quality of work, performance, cost, and importance to the community, the aspects of protection of his or her own health and the health of others, environmental protection and preservation of cultural and social values.*

A teacher might infer from this description that pupils should be able to work with the products of Practical Education with caution, and should be able to assess their quality. Another teacher might believe that pupils should consider the quality of a final product of any activity in any subject (because key competences are applicable in all subjects), and always think of job security and the impact of their activities on the environment. Yet another could infer that quality matters, but pupils should instead consider the safety aspect of their activity and its social values, and wants to teach them to produce not only useful, but also aesthetic objects.

Each of these teachers would focus on slightly different aspects of the definition, and consequently would ask different things from the pupils, as well as assess them on a different basis. However, their pupils would miss some important aspects during this process: the pupils of the first would perhaps fall behind in planning their activities; the pupils of the other would not be so good at assessing aesthetic quality of a product; and the last group would not learn how to protect themselves at work. To avoid this, teachers need to discuss all aspects which form the descriptions of key competences in the National Curricula.

Levels of key competences

Once the teachers have defined and agreed upon what pupils should demonstrate if they have mastered certain key competences, it will be much easier for them to **plan** assignments and timetables which lead pupils to the desired competencies. At the same time, the teachers will have a better idea about the criteria that would indicate whether a pupil is developing the competences or not, which will help them to track a pupil's progress. Consequently, the teachers will be better able to adapt their teaching strategies to individual pupils, and to the class as a whole.

Let us now look at some examples from the handbook which show how the activities

leading to the development of key competences can be specified.

We have chosen one of the specific aims of the Civic Competences:

By the end of his or her basic education, the pupil:
considers and assesses phenomena, processes, events and problems around from various perspectives;

	Grade 5	Grade 9
5.3	when judging specific and not too complex phenomena, processes, events and problems, the pupil can ask the follow question: "How would I perceive this if I were someone else?" (e.g. another pupil, teacher or a parent)	considers and judges phenomena, processes, events and issues from diverse perspectives

We can ask a pupil in Grade 5 to modify his or her opinion and consider another point of view by asking himself or herself, for instance, "and what would Dad think of this"? A pupil in Grade 9 should be able to consider several points of view without even asking such auxiliary questions.

At some places, we have suggested other examples of specific and observable activities or situations in which pupils of Grade 5 and 9 display appropriate acquisition of certain competencies. These examples are not meant as activities through which the competencies should be practiced or tested, but rather as hints which will help teachers to better understand the suggested levels of unpacked competencies. Of course, it is up to the individual teacher to work with these suggestions as s/he thinks appropriate.

Another example of unpacked Civic competences:

	Grade 5	Grade 9
Sustainable Life		
5.15	- respects basic rules of sustainable life	- considers his/her needs and demands and tries to modify them with regard to the sustainability of life
Example:	*Recycles, switches off when s/he leaves the room, does not waste water, etc.*	*Differentiates between what s/he really needs, what s/he wants for pleasure, what s/he wants for prestige and what from habit (as for instance heaps of Christmas presents). The pupil compares prices and the effective value of goods. S/he is aware of different reasons for purchasing certain goods or services. S/he does not bully classmates who do not follow the latest fashion trends. S/he uses materials economically.*

Towards School Curriculum

Setting up a School Curriculum – how to become a team
How can the unpacking of key competences help in setting up a School Curriculum? By looking for common ground in interpreting the definitions of key competences at the national level, and by coordinating the system of development of key competences across all subjects, the teaching staff of a school can experience genuine cooperation, leading

to a specific and essential goal. It is therefore important to realize that each member of the staff contributes to the development of the pupils, and that the activities they use for developing pupils' key competences should **synergize with the activities prepared by their colleagues** in other subjects. A prerequisite of a successful cooperation is then that all members are included in the process, i.e. that **everybody feels that their contribution is useful for attaining a common goal.** This stage is also important for the practical realization of the School Curriculum; this is why the teachers should not skip this stage and, for instance, copy another school's Curriculum. Last, but not least, the support of the principal plays a crucial role in setting up a successful School Curriculum.

Teachers also need to **agree upon how demanding their requirements of pupils at various stages should be.** As there are almost no surveys which could help them in this respect, they need to base the agreement mainly on their own experience. As a team, they should therefore reach a consensus on:

- What the pupils will need in their life,
- What exactly the requirements contained in the definitions of key competences mean,
- How the requirements can be divided into consecutive stages appropriate for each grade.

Fair Evaluation of key competences

Evaluation in general is a complex task, and evaluation of key competences is particularly intricate. But once we have broken down the general definitions into more specific activities and have set up consecutive stages for the gradual development of the competencies, we can use this as a rather **solid ground for defining evaluation criteria.** These criteria will help us evaluate the progress of individual pupils. The criteria are useful not only for the teachers, but also for the pupils. The pupil who understands the criteria has a better idea of what he or she is expected to achieve. The pupil can better judge his or her own progress and work on it more efficiently, **following his or her own path**, rather than comparing his or her progress to that of other classmates

Subject Syllabus is not a List of Topics to Cover

Setting up a list of topics that should be covered by each grade is not the same as setting up a plan for systematic development of pupils' key competences. Besides covering relevant subject matter, teachers also have to decide upon:

- **meaningful** order of pupils' **activities**,
- **teaching and learning conditions**, as well as general conditions,
- what **teaching strategies and methods** will be most appropriate for the set goals.

Every School Curriculum must contain teaching and educational strategies. These comprise conditions for teaching as well as rules and general methods of teaching. Specification of systematic development of pupils' key competences should be stipulated in this part of School Curriculum, as well as in subjects' syllabi. We have seen that many teachers need to become more familiar with this approach to planning and organizing their

teaching methods. So far, in many schools the competences have been developed mainly outside the individual lessons, i.e. during various excursions, in projects, school government, or when conflicts between pupils are being settled. However, a substantial change in teaching style, and consequently a change in pupils' achievements, ensues only when the development of pupils' key competences becomes an integral part of all activities at school, including daily work within individual subjects.

Development of key competences through Conceptual Teaching and Learning

A prerequisite to the successful development of pupils' key competences is that both teaching and learning are conceptual. Conceptual and methodical teaching is not the same as the repeated and spontaneous process of learning, rather it is a professional and intentional procedure. During this procedure, teachers should focus on one or two main goals, knowing, however, that a pupil will simultaneously acquire other skills and competences. Thus, even though natural and spontaneous learning procedures serve as a basis, the directed and conceptual aspect is added as a meaningful extension to this basis. And it is this extension that makes the teaching and learning process more effective.

A well prepared School Curriculum aims at interlinking the conceptual teaching and learning with a child's natural curiosity and concern. We have experienced that in many schools the new School Curriculum is still a formality. However, we assume - and there are already cases which prove us right - that more and more schools will realize that the School Curriculum is a useful, and in fact necessary, tool of successful and quality teaching which results in the fulfilment of the new standards and requirements. They should also conclude that shift from a "pro-forma" Curriculum towards a practical one will be needed.

Unpacking Learning Competences – An Example

Let us now look at an example of an unpacked competency as a whole. The Learning Competences are defined in the National Curriculum for Basic Education as follows:

"By the end of his or her basic education, the pupil:

- selects and uses suitable procedures, methods and strategies for efficient learning; plans, organizes and manages his or her own learning process; is willing to devote his or her time and efforts to additional study and life-long learning;
- searches for and sorts out pieces of information, and based on their understanding, interlinking and systemization, uses them efficiently within the learning process in, creative activities and practical life;
- works with commonly used terms, signs and symbols; interlinks things with respect to their context; sets knowledge from different educational areas within a wider context, and based on this, forms a comprehensive view of mathematical, scientific, social and cultural phenomena;
- makes independent observations and experiments; compares the pieces of knowledge so gained, assesses them critically and draws conclusions from them for future use;
- recognizes the meaning and goal of learning; has a positive attitude towards learning; assesses his or her own progress and identifies obstacles or problems hindering his or

her learning progress; makes plans as to how to improve his or her learning; makes a critical assessment of his or her own learning results and discusses them."

Unpacking Learning Competences

	Grade 5	Grade 9
Learning Methods		
1.1	- the pupil is aware that there are different ways of learning; when helped by the teacher s/he tries out and judges which ways suits him/her best. Consequently, s/he uses the methods that have worked best for him/her for the next assignments.	- the pupil knows which methods and ways of learning work most effectively for him/her and uses them intentionally
1.2	- s/he asks his/her classmates politely to get quiet when s/he does not want to be disturbed; s/he respects that others do not whish to be disturbed either	- when studying s/he eliminates all disturbances and creates optimal environment for his/her learning; s/he chooses environment most convenient for his/her learning and adapt it further to his/her needs
1.3	- in case s/he needs help with his/her learning, s/he agrees on place, time and duration of a consultation should the consultant (e.g. classmate, teacher, another adult) be momentarily busy	- recognizes when it is most effective to cooperate and communicate during the learning process, and when it is best to work individually
1.4	- s/he uses the school breaks for relaxing and not for catching up with the home preparation; s/he prepares for classes continuously, s/he alternates between work and relaxation	- follows the principles of mental hygiene during the learning process – chooses the ways of relaxing that conveys him/her best, and does so regularly and according to his/her needs during the home preparation
Classes		
1.5	- interrupts the lesson if the topic is not clear to him, if it is too difficult or too easy, s/he is not afraid to ask for explanation or examples, s/he is eager to know where to find further information on interesting	- influences the progress of a lesson in order to gain as much as possible; demands actively further explanation of familiar issues; wants to know further information sources and share them actively with the others when better acquainted with the topic
1.6	- follows various class activities (individual research, cooperative activities, e.g.) according to the teacher's assignment, in cooperation with teacher proposes his/her own ways of studying	- chooses such activities in the process of learning or fulfilling a task which seem most appropriate with regard to his/her personality and the task's character; s/he can explained his/her choice (e.g. individual work when analyzing a complex text, team work when working on a long-term project etc.)
1.7	- the pupil is able to produce, under the teacher's supervision, reasonably long notes to the text from a textbook and structures them properly	- the pupil makes notes individually, s/he can produce a text of a rather complex form and character (such as essay, review, project draft)
1.8	- gives and explains examples of how s/he will use information or skills acquired at school in his/her private life, or in further studies or occupations	- explains why s/he learns, why s/he acquires divers skills and how these can be used in his/her further studies, work or private life; actively applies facts and skills acquired in one subject in other subjects too
Learning Results		
1.9	- is not afraid to seek advice form the teacher on how s/he could improve his/her results; seeks support, advice and help if need be, is not embarrassed to attend tutor classes, does not trivialize unfavourable evaluation, but understands it as a challenge for further work and studying	- scrutinizes strengths and weaknesses of his/her learning process; recognizes hindrances and problems in his/her learning process, initiates discussions on this topic; welcomes support, advice, feedback and critique; suggests his/her own plan for further improvement

1.10	- does not mock others when they do not answer correctly; does not make false excuses if s/he makes a mistake	- identifies his/her own mistake and finds out where it comes from; does not perceive mistake as failure or a reason for being ashamed, does not get discouraged by mistakes, but understands them as a challenge for further learning; seeks and finds how to redress mistakes; changes prepared steps after s/he has realized they are not effective
1.11	- with teacher's help, sets up basic conditions and criteria for successful fulfilment of a task (submits the task in due time, in agreed form and scope, answers correctly the assigned question, in case of ambiguity justifies his/her solution)	- sets up, or cooperates on setting up criteria for evaluation of his/her work, makes self-evaluation orally or in writing (in form of journals, reports, questionnaires); up-dates the self-evaluation continuously, recognizes his/her own progress as well as stagnancy
1.12	- describes briefly his/her work on a given assignment, formulates what s/he liked and disliked, assesses what s/he did well and wrong or where s/he made a mistake, admits when s/he has made mistake, can cope with negative feedback	- reflects both orally and in writing his/her learning progress, modifies his/her own learning methods if necessary
1.13	- discusses openly with the teacher and other classmates about various aspects of his/her knowledge and skills; asks for advice or help if necessary	- judges realistically how sufficient his/her knowledge and skills are in order to meet specific assignments; identifies what else s/he needs to learn; is able to formulate questions about what else s/he needs to learn
1.14	- differentiates between major and minor goals, manages the time necessary for the preparations of the task; plans his/her learning process *Works with a weekly plan.*	- can set individual learning goals based on his/her priorities (such as further studies, occupation, interests, personal progress) and can justify the choice; feels responsible for his/her personal development, sets up a plan of his/her learning progress
Working with Information		
1.15	- accomplishes a simple assignment while using proposed information sources *Searches for information on the Internet, borrows a book from the library, uses encyclopaedias, asks relevant persons for help.*	- actively uses various information sources (books, encyclopaedias, manuals, charts, diagrams, newspapers and magazines, individuals, Internet...); chooses the appropriate source and justifies the choice
Application of Knowledge		
1.16	- articulates the relevance of learned information for everyday life; interlinks new information with previous experience *Pupils find out how many litres of liquid one should drink per day. They know from previous experience that they perspire more when it's hot. They induce that in hot weather they need to drink more.*	- understands acquired information within a context; can explain the meaning and purpose of the acquired information (articulates the main idea, formulates the content and the meaning of the acquired information) *Pupils explain why people perspire more in hot weather – the body needs to cool down more. They also know that a perspiring body loses some minerals which have to be supplied. They suggest what to eat and drink in order to counterbalance the deficit.*

Future Challenges

In General

As mentioned above, the curricular reform has been successfully launched. However, there is still a long way to go towards its smooth implementation. What then are the most important steps we should now take? The main areas we need to focus on are the development and testing of suitable assessment tools, and appropriate teacher training aimed at

the development of teachers´ key competences. These are also the main areas of interest of the Research Institute of Education, a curricular institute which outlined the reform and now deals predominantly with the reform's implementation.

In the context of this work, there are some other questions we are trying to answer, such as: Is it really possible to systemize the work on the development of key competences? Does every child develop key competences in the same way, at the same pace, or is the whole process different for each individual? And what would it imply for the implementation of a competence-based curriculum?
What role does a teacher's personality and professional experience play in the process of verifying teaching methods aimed at the development of key competences? And consequently, when we verify a new teaching method in practice, do we learn more about the method itself or about the teacher? Is our system, i.e. the teachers, pupils, and their parents, as well as the institutions of tertiary education, ready to accept and adopt tools for the assessment of key competences? And if not, what steps must we take in order to provoke a change? How can we motivate teachers to become more open towards the changes outlined in the new curricula? Will changes in management or a different approach to how a teacher's work is appreciated and rewarded help, and if so, to what extent?
Another issue to consider is whether we should shift the spotlight from the development of key competences so some more general concepts and ideas, where the key competences would function rather as a certain "side product". The reason for this would be that many teachers are still quite sceptical towards the term key competences, and probably towards the concept itself, and show resistance to the term, even though the message itself might seem compelling to them.

"The KEY" Project Proposal

A particular reaction to the questions, or challenges outlined above is a project that the Research Institute of Education is preparing at the moment. The project, which is called "The Key", should be completed within the next three years, and focuses on two main areas:

Developing a system of methodical tools for implementing competence-based teaching practice

As suggested in the previous text, many Czech teachers still feel insecure about how to tackle the key competences, which are presented as one of the main objectives of Czech education. There have been several handbooks published, as well as other methodical tools which have been presented to teachers. What they lack, however, is a systematic and organized approach to this issue. There are several key aspects that the teachers struggle with: First, what exactly they need to do in individual lessons in order to develop a pupils' key competences, and how to interlink the development of key competences with the educational content; second, how to assess the development of key competences; and third, what are the stages a pupil has to go through in order to attain certain key competences. Within the project, teaching methods which lead to the development of pupils key competences will be collected and adapted to specific educational content and teaching

situations. The stages of key competences development will be described; this description will serve as a basis for so-called Development maps suggested for each key competence. This tool, which has been successfully used in New Zealand and Australia, will also help teachers "diagnose" individual pupil's progress towards mastery of particular key competences, and consequently to choose appropriate teaching methods, from among the methods collected and evaluated during the project's first stage.

At the end of the project, after the methods have been verified in practice, all schools in the Czech Republic will receive

- a collection of methods described in the particular context of individual subjects and their educational content
- suggestions of Development maps for all six key competences defined in the National Curricula with references to particular methods that can be applied in order to develop the key competences at particular stages
- guidelines for the use of the development maps and assessment of pupils' activities leading towards their key competences development
- DVD with examples of good practice

Teachers' skills necessary for developing pupils' key competences

A condition for successful development of pupils' key competences is that teachers themselves have certain skills and competencies. Many teachers need and ask for training which will enable them better to develop pupils' key competences. The practice reveals that there are roughly three categories of teachers in this respect:

- Those who don't apply any methods aimed at key competences development; those who are against the whole concept or who don't know how to work with key competences development.
- Those who do use some of the methods, but they do so randomly and without much success.
- Those who use the methods in a successful way see the benefits of it but they lack a systemic approach to their work.

Of course, these three categories have different needs.

- They first need basic and practical information, they need to feel that this kind of work will help them in their teaching practice and in this way be motivated to find out more about the issue.
- They need to become more secure with the use of methods developing pupils' key competences, in other words, they need coaching and sharing of best practices.
- They need help creating a systemic approach to their work so that they can plan and organize the teaching more effectively.

A part of the project will therefore focus on developing a complex training system that will involve all three groups, and that will be based on cooperation and peer learning among teachers of all three categories. Last, but not least, we hope this work will help us hone teachers' skills and competences necessary for competence-based teaching.

References

Research Institute of Education in Prague: *Framework Education Programme for Basic Education and Annex to the Framework Education Programme for Basic Education Specifying the Education of Pupils with Mild Mental Disabilities (FEP BE MMD).* Prague 2005. http://www.rvp.cz/soubor/RVPZV_2007-07.pdf (in Czech).

Research Institute of Education in Prague: *Manual for Developing School Curriculum for Basic Education.* Prague (2005).

Research Institute of Education in Prague: *Key competences in Basic Education (Klícové kompetence v základním vzdelávání).* Prague (2007).

Implementing key competences, Hungary

— *Katalin Falus, Márta Hunya, Attila Varga*

Main features of the Hungarian School System

In Hungary most pupils attend state schools maintained and organized by various organs of public administration – mainly by local governments. Funding of educational institutions is irrespective of sectors: both public and private institutes are financed along the same criteria. The school system is decentralized, there is no inspectorate, and the maintainers are responsible for the appropriate operation of the schools.

In Hungary the education system is flexible regarding the starting age of compulsory school education; pupils can start their education any time between the ages of 5 and 7. Public education starts with a preparatory year organized in pre-school institutions, and is followed by general school education. Pupils may progress to secondary schools either after grades 4, 6 or 8. There are three types of secondary schools: general secondary school, vocational secondary school and vocational training school. These latter schools also provide general education up to the age of 16. Secondary school leaving examinations are taken after completing general or vocational secondary school studies, and passing this examination is the pre-condition for entering higher education. Education is compulsory up to the age of 18.

General schools are obliged to enrol all pupils living in their districts. Parents, however, can choose any other school provided there are free places after having enrolled all district pupils. Secondary schools may organize entrance examinations; the organization of these examinations is regulated by the Ministry of Education and Culture. Integrated education is compulsory at all levels of schooling.

During the school year the performance of pupils is measured several times based on oral or written tests. The performances are assessed on a scale ranging from 1 to 5; 1 being the lowest (inadequate performance or failure) and 5 the highest (excellent performance). Marks in the school certificates (after the first half and at the end of the school year) are based on the marks pupils receive during the year. In the first two and a half years there are no marks in school certificates; pupils' performances are analysed and assessed in a report form. During the first three years pupils may repeat a grade only on their parents' request. All schools have to develop a comprehensive system of assessment and marking of their own, which has to be approved of by parents and the school maintainer. There is only one uniform and standardized examination organized by the state, the secondary school-leaving examination.

An organic part of the reform processes aiming at the renewal of education is the shift

from traditional content-based education to competence-based one. This is reflected in legislation, in-service teacher training and content development as well.

Levels of content development

The document regulating the content of public education in Hungary is the National Core Curriculum (NCC), which is a government decree, a law obliging all. Framework curricula and educational programmes, programme packages – accredited recommendations in compliance with NCC – are all based on it. The third, local level of regulation includes educational programmes and local curricula of schools, which contain regulations obliging the given schools. The two-level secondary school-leaving examination serves as an entrance examination to higher education, the requirements are adjusted to NCC. Framework curricula also have to be in compliance with the specifications of the secondary school-leaving examination.

The main function of the National Core Curriculum is to lay down the principles and conceptual basis of public education. While ensuring the autonomy of schools in selecting educational content, it defines the national objectives of public education, identifies the main areas of knowledge to be transmitted, provides guidelines how to spread this content over the various phases of public education, and defines the key development tasks of the various content phases. By giving a summary of the values, knowledge and skills to be acquired at school and interpreting knowledge and learning NCC ensures the consistency and coherence of public education. It is regularly revised by a committee called for by the minister of education and culture. As a result of the 2007 revision NCC now has several new elements that serve the adaptation of the key competences framework of the European Union.

The EU key competences are present in the introductory chapter of NCC *'Shared values in school education'*, the only difference being the separation of competences in science and mathematical competences. The chapter *'Key development tasks'* has been completed by tasks resulting from EU membership and by the main objectives related to active citizenship (education for active citizenship, educating for democracy, learning-to-learn, classroom management; the chapter on *'Economic Knowledge'* has been completed by a separate part). NCC stipulates that both framework curricula and educational programmes include inclusive educational approaches, aspects and contents of health improvement, educating for environment-conscious behaviour, and educating for consumer protection.

The framework curricula/educational programmes issued by the minister of education and culture reflect the shared values defined in NCC. The prerequisite of accrediting such programmes is that children's and pupils' rights and equal chances for learning be exercised while using them. Their contents, requirements and tasks are suitable for developing and improving competences; they provide guidelines for achieving both key develop-

ment tasks and development tasks connected to various cultural domains while at the same time they are open to further improvement and adaptive use. Together with NCC the framework curricula, the educational programmes and the programme packages serve as reference points for authors and editors of textbooks, developers of resource materials, examination specifications, national assessment and evaluation tools, and mainly for teaching staffs of schools who develop or compile local curricula.

The basic requirement for local curricula is compliance with the NCC. There are three options for schools in preparing their local curricula: (1) the school may adopt a completed framework curriculum; (2) the school may compile its local curriculum using the available curricula, educational programmes or programme packages; (3) the school may develop its own local curriculum or use the one it already has. When adopting completed framework curricula or developing local curricula of their own, schools have to take into account the requirements of the secondary school-leaving examination. Local curricula show an increasing influence of national assessment tests and secondary school entrance tests.

Research data on developing competences prove that in Hungary primary education does not allow enough time and assistance for pupils to acquire the basic competences that are essential for further studies. Therefore the last amendment to the Act on Public Education orders that as of September 2008 in grades 5 and 6 of public education (in the so-called consolidating phase) 25 to 50 percent of the available teaching time be used for increasing the effectiveness of consolidating competences and this should be done in a non-subject context. The main feature of such a context is that there is no need for breaking down knowledge to be transmitted into subjects (so the subject structure can be passed by) and thus the key competences defined in the NCC can be developed more effectively.

Schools can get assistance for introducing changes effectively from various sources. The Ministry of Education and Culture had the old framework curricula revised, and these curricula now provide content and methodological guidelines for schools in adapting their local curricula to the new legislation. A new framework curriculum will be developed with the aim of giving professional assistance to school in developing local curricula complying with the requirements of the National Core Curriculum and the new legislation.

According to this recommendation a new subject is introduced in the first four grades (regarded by the NCC as one phase), which is aimed at developing the thinking, learning and social competences of children in a complex way by using activating, cooperative methods and innovative ways of classroom management. This module-like subject is organized around eight issues (developing learning techniques, self-image and self-knowledge, relations, rules, behaviour, healthy life, community and value system) and in grades 1-4 these issues, the content of which is spirally extended through the years, are discussed in a way that suits the various ages of pupils. This framework curriculum is more detailed than the previous ones were and offers nearly syllabus-like descriptions to facilitate the achievement of the aims of developing competences.

According to the new framework curricula in grades 5 and 6 as much as 50 percent of the available teaching time is organized in non-subject context, in so-called "knowledge and skill domains" organized as problem areas. These domains are: *Communication, Everyday life, Homeland, Rules, Space and time, Developing thinking and learning.* The framework curricula use the time frame traditionally used for Hungarian language, science, history, ICT, technology and lifestyle and the lesson spent with the form teacher. The description of the various "knowledge and skill domains" is also more detailed here than it was in the previous framework curricula. On the level of "themes" it refers to the cultural domains and the key competences to be developed as defined in the NCC, while on the level of "topics" the contents and related activities are listed. This non-subject-based framework curricula for grades 5 and 6 is characterized by inter- and multidisciplinary approach: the skills areas and the subjects are approached from the complexity of real phenomena and not from fragmented scientific aspects. In the framework curriculum it is emphasized that the significance of learning has increased, and that teacher's roles are changing. Teachers can find appropriate help in the curriculum for developing competences, using new methodology, classroom management and assessment.

In addition to the curriculum guidelines the educational government helps the introduction of non-subject-based education in grades 5 and 6 by in-service teacher training courses as well. The main target groups of the 120-hour in-service courses are subject teachers who previously taught their subjects in these grades. In the in-service courses these teachers acquire the competences required for non-subject-based teaching and receive the qualification required for competence-based education. The qualification of primary teachers generally entitles them to teach in grades 1-4 but having completed the in-service course they may teach in grades 5 and 6 as well. The in-service courses focus on the educational procedures serving the development of basic competences. (OKM 2007)

The assessment system, its objectives and relation to key competences.

In Hungary regular national measurement of competences was first introduced in 2001. All pupils in grades 4, 6, 8 and 10 take the tests. Competences are measured in two areas: in reading comprehension and in mathematics. The PISA tests influenced both the content of the assessment and the development of the framework of references (content framework) serving as a basis for assessments. The framework of references describes the content areas that where reading comprehension competences and mathematical problem solving skills are measured and also the operations appearing in the tasks. Assessment materials and the measurement itself as well as the scores that the schools receive as feedback influence the content of education in an indirect way. The function of such an assessment is double: evaluate and give feedback and to give a diagnosis on the levels of schools, settlements and regions or nationally. Teachers on the other hand can use the results to draw up individual develop plans for their students. The requirements of the secondary school-leaving examination have a similar regulating function.

'The aim of the assessment of the [reading comprehension] competence is to find out whether pupils can use their abilities to read and understand various texts in real life, whether they are able to use them for further learning and information-seeking, i.e. whether they have the abilities that are essential for progression." (Tartalmi keret ... 2006).

In mathematics the aim of assessing competences is to assess "the abilities of applying the elements of mathematical literacy". This "*includes the ability to understand and analyse the role of mathematics in real life, to use the basic elements of mathematical literacy, the desire for and the ability of using mathematical knowledge in real life situations, the use of mathematical tools in social communication and cooperation at the level appropriate for the age of the pupils" (Tartalmi keret ... 2006).*

Hungary has participated in three regular international measurements: PISA (2000, 2003, 2006), IEA PIRLS (2001, 2006) and IEA TIMSS (1995, 1999, 2003, 2007).

Policy support for the implementation of key competences

Secondary school-leaving examinations, development tasks

Seeing the increasing role of examinations in regulating public education all over the world the educational policy recognized that these exams influence the content and methodology of education in a direct way. If the knowledge and skills measured at the examinations follow the system and the concept of learning of key competences, the chances will increase for competence-based approaches to become widespread in the practice of public education. That is why in Hungary one of the cornerstones of developing key competences is the development of examinations and related task development.

In Hungary the old school-leaving exam was replaced by a new output regulation in 2005. In developing examination specifications experts relied on the National Core Curriculum encouraging competence development and the European processes of defining competences. The requirements shifted from being knowledge-centred towards ability-centred, competence-oriented assessment. In compliance with the NCC, the framework curricula, and the reform processes in general, the examination contains an increasing number of cross-curricular elements, and the tasks are increasingly similar to the problems of real life.

Students themselves can choose whether they wish to take an intermediate or a higher level exam in various subjects. Institutes of higher education may require higher level exam as a precondition for entrance. Intermediate level examinations are administered at schools with external control, while higher level examinations are administered in examination centres. Secondary school-leaving examinations function as entrance examinations to higher education institutions as well. In the case of a successfully completed school-leaving exam in foreign language or in informatics students receive a certified language exam certificate or an ECDL certificate, respectively. (Horváth-Lukács 2006a).

The new secondary school-leaving examination is uniform and standardized. Examiners are prepared centrally for assessing performances. Compulsory subjects are: native language and literature, foreign language, history and mathematics. Students have to choose a fifth, optional subject as well.

The new examination system in itself could not bring about sweeping changes in everyday educational practice, it is also necessary that teachers and students receive help for this change. The introduction of the new system was preceded by pilot examinations and public surveys between 2000 and 2005. In this period electronic manuals were compiled to assist teachers in preparing themselves and their students for the new exam. A system of examiners' training was developed and introduced. The experiences accumulated in this process gave rise to the idea that a central task bank is necessary. This collection of competence-based tasks increases continuously due to significant resources and contains tasks that help students and teachers to perform successfully in the new system; it also gives plentiful samples of the task types preferred in the reform process. These tasks that focus on formative assessment were developed for the following domains or subjects: reading comprehension, creating a text, mathematical problem solving, foreign language competences (English, German, and French), digital literacy, social, life and environmental competences (biology, physics, chemistry, geography, history, art and visual culture).

"The development task is a teaching aid for teachers; it contains clear instructions and requires various problem solving activities. Task completion is based on students' activities (a series of activities, a system of activities). Task contents are interesting, motivating, sometimes give a flow-experience. The task is usually a part of a set of tasks, i.e. of a didactic bloc, within which development aims (competences to be developed), activities, procedures, steps in learning and problem solving can be identified. Development tasks are suitable for and require giving supportive, evaluative feedback, i.e. formative assessment. Reflective teacher's behaviour, supportive emotional climate and formative, criteria-oriented assessment create an ideal teaching and learning environment, in which these tasks become effective." (Horváth-Lukács 2006b)

Competence-based educational programme packages

The most significant, new practical element of the educational reform is the development of competence-based educational programme packages. These programme packages create an educational environment favourable for competence-based education.

"The programme package is a complex set of teaching aids coming into existence with a concrete aim and serving the teaching-learning process that connects knowledge transfer with a consciously planned development of skills and abilities offering a kind of knowledge that can be mobilized and used in the long run as well. In addition to various learning tools it includes tools that help to plan, organize and evaluate the process. Accordingly, an educational programme package contains in a complex way all the elements that are traditionally represented in the teaching and learning process by curricula, textbooks, workbooks, collections of texts and tasks, teachers' books and teaching aids, and the tools for assessment and evaluation." (Pála 2006).

An educational programme package is based on a professional concept (defining the competences to be developed, the system of abilities and the strategy and methodology for their development), contains a programme curriculum (aims, requirements, principles of assessment, selection of the content, organization of the content in time, the focus and nodes of ability development). The detailed module descriptions give teachers help how to process a topic; they list pupils' activities, recommended tools, methods, procedures of organizing and evaluating learning. Learning aids in the programme packages can be diverse: they may be information carriers, task carriers or the combination of the two, traditional or digital learning aids, e.g. printed workbooks, textbooks or digital teaching materials such as simulations or animations. Assessment and evaluation tools can also be found in the programme packages. In-service courses accompany them, in which teachers are prepared for introducing, using and adapting the programme packages. A support system makes the use of these packages easier and workshops are organized to provide counselling and mentoring.

The competence-based educational programme packages are developed and piloted gradually, with the help of the European development funds. In 2005 more than a hundred pre-schools and schools (1,380 teachers) piloted and helped to finalize the products of the first development phase. Since the autumn of 2006 several thousand of teachers and pupils have used the programme packages in further 361 educational institutions that won competitions. Several service providers organized trainings for 6,300 teachers from 1,600 educational institutions prior to the introduction of these packages. Until March 2008 as a result of continuous feedback and development 39 programme packages have been developed connected to six priority competence areas. These programme packages help consolidating the competences and abilities for lifelong learning throughout the whole time-span of public education.

Based on the highest level regulatory documents of public education in Hungary and on the documents of the working group of the European Commission dealing with key competences for life long learning, programme development has started in the following areas: pre-school education, understanding and creating texts, mathematical-logical competence, foreign language competences, social, life and environmental competences, career-building competences, ICT. In all these areas special emphasis is given to competences that cannot be linked to disciplines, subjects, or cultural domains such as learning-to-learn, co-operation, problem solving competences, creativity, motivation, etc. (Pála 2006).

Digital competence

Developing digital competence and increasing the level of digital literacy has been a priority of educational policy in Hungary for long. The three-year Educational Information Strategy of 2004 says: "*the goal of the Educational Information Strategy is to create a framework for the establishment of information devices, educational methods and an educational information network meeting the requirements of the modern knowledge-based society that*

effectively supports the work of students and teachers participating in the public and higher education, as well as for the introduction and operation of management information systems that effectively assist the best use of public and other educational resources." (Oktatási ... 2004)

The main strategic objectives for 2004-2006 are as follows:

- developing, adapting and distributing educational methods supported by ICT at all levels of education;
- digitalising learning contents, providing electronic access to all digital learning contents;
- ensuring a continuing provision of the institutional information infrastructure
- establishing a unified educational identification system, ensuring a continuous development of the infrastructure and ICT applications serving educational, controlling and other administrative processes;
- setting up monitoring and statistical systems and setting standards for educational information applications.

Although the new educational information strategy has not been developed yet, priorities have not changed. Digital competence – together with the other EU key competences – is present in the National Core Curriculum, the former (2003) version of which had already introduced informatics as an independent subject for the first 4 grades and defined requirements for the end of grade 4. Information and communication culture is still a priority area in the NCC, and the use of ICT is a priority at cross-curricular level as well. NCC has taken over the competence-definition of the EU framework of references without major alterations in this area as well.

A comprehensive programme has helped the use of ICT for educational purposes since 1994. In addition to the development of school information infrastructure content development, in-service teacher training and the development of a portal (Sulinet Digital Knowledge Base, http://sdt.sulinet.hu) providing access to digital teaching material gained momentum in 2004 and have been going on ever since. This comprehensive development is connected to the national digitalisation programme as a result of which a significant part of the treasures of our national culture can now be found on the Internet. The development is funded from European and Hungarian resources; the digitalised contents are available for everyone free.

Although the infrastructure does not lag behind the European average, survey results show that digital competence is developed mainly in lessons of informatics; the use of ICT is not common in other subjects. About 50 percent of teachers use ICT during their lessons once or twice a year, the proportions of those who use ICT regularly is very small, it is between 10 to 30 per cent in various subjects, the higher numbers are found in science subjects.

The adequate use of ICT is facilitated by in-service teacher training connected to developments. The majority of teachers had already learnt how to use the devices in previous courses and now training in methodology is necessary. In the framework of several na-

tional and international projects pupils and teachers have the opportunity to deal with motivating tasks by using ICT in teaching and learning.

Social competence

Curriculum level

The definition of social and civic competences in the NCC is identical with the relevant definition of the EU document. In the chapter *'Key development tasks'* key competences are given a special emphasis. In this part the development of social and civic competences is served by the tasks formulated in *Homeland and national culture, European awareness – global culture, Education for active citizenship and democracy, Economic education, Education for environment-consciousness, Preparing for the roles of adult life and partly in Self image and self knowledge, Learning-to-learn.* The chapter *'NCC and local level regulation'* identifies the shared values of school education, and states that all schools – irrespective of their maintainers – have to ensure that their pupils acquire basic knowledge and competences of ethics. This is where the significance of the non-subject-based education in grades 5 and 6 is stressed. Besides all this, all the ten cultural domains prescribe competence-based development. To develop social competences is the task of all the cultural domains while education for active citizenship is emphasized in the cultural domain of *Man and society*.

The precondition for accrediting a framework curriculum is that pupils' and children's rights as well as equal chances for education be exercised when the curriculum is used; it should be in compliance with the key competences identified in the NCC; its contents, requirements and tasks should be suitable for developing competences; and should offer guidelines for completing both priority tasks and tasks connected to separate cultural domains.

The framework curricula recommended by the Ministry of Education and Culture has already been rewritten and adapted to the revised NCC of 2007. Primary education in its first phase (grades 1-4) prepares the process of developing key competences, strengthens the competences required for a successful school career and lifelong learning, and for acquiring uniform basic knowledge. In this phase social competences can mainly be developed by using cooperative techniques for processing teaching contents. The education of young children has to build on the cooperation of pupils, exciting activities arising from problem situations and tasks encouraging creativity. Examples and training grounds are provided for acquiring norms and rules of conduct, for learning how to participate and cooperate in communities, for problem solving and conflict management. It reinforces humane behaviour patterns, habits and by shaping the character of the child it facilitates the development and maturing of the personality and the formation of responsible citizen's behaviour.

In the further phases of education the work started in the first phase, i.e. the development of key competences, basic skills and abilities is continued. In the process of socialization

children become aware of the democratic operation of a community and learn some general rules of it at school. The concepts of individual and common interests, majority and minority are made clear and also why they are important in our relation to each other or to the community. It prepares pupils for exercising their rights and doing their duties. The democratic norms are extended to the responsibility for the natural and constructed environment, to everyday behaviour. A main task of the school is to educate pupils for identifying and keeping national, national minority and ethnic traditions. With its teaching-educating activity the school develops in its pupils a sense of national identity and creates a desire for knowing the various cultures of peoples living next to each other. It strengthens the sense of belonging to Europe and urges to learn and respect other people's traditions, culture, customs, and ways of life. At the same time it also presents the common problems of Mankind. (Framework curricula recommended by the Ministry of Education and Culture).

The development of social competences in all the knowledge and competence areas of the framework curriculum of non-subject-based education (grades 5 and 6) is a priority. It is especially emphasized in the domains of *Everyday life* and *Developing thinking and learning* but it is also present in all other domains especially in the forms of alternative ways of classroom management (projects, cooperative and other methods encouraging cooperation). The curriculum stresses the following social competences: norm awareness; basic concepts related to individual, group, non-discrimination, society and culture; effective communication; considering and understanding various viewpoints; empathy; tolerance; responsiveness to changes; cooperation; recognition of diversity; socio-economic development; interest in communication between different cultures; overcoming personal prejudices; readiness to compromise; democratic and ethic behaviour; solidarity and interest in solving community problems; full respect of human rights; respect for equality and democracy; a sense of belonging to the settlement, the country, the European Union and to Europe in general; openness to responsible participation; expressing the acceptance of and respect for shared values; respect for others' values and private lives; support for sustainable development; respect for social diversity and cohesion.

Support System

More than ten years ago in the National Institute for Public Education (today Hungarian Institute for Educational Research and Development) we started to develop programmes that not only gave information on *Man and society* but were also aimed to develop thinking-learning and social competences. As a result of our development work that ended recently modular teaching materials for developing competences were published in four books (*Man, Ethics, Society and Citizenship*). We have also developed the specifications of the two-level secondary school-leaving examination for the cultural domain *Man and Society*, according to which students can choose a centrally set topic and do project work (do research, prepare questionnaires for surveys, conduct surveys, create multimedia products or do organizational work).

In the last three years central content development work has been done in the framework

of the National Development Plan with the leadership of suliNova Public Benefit Company. As a part of this work six programme packages have been produced for developing social competences (separate packages have been produced for grades 1-6 and 7-12, and for activities in the classes, for cross-curricular activities and for leisure time activities). Each of these packages aim at the joint development of the following skills and abilities: critical thinking, planned and motivated work, willpower, stamina, creativity, problem solving thinking, conflict management, keeping the rules, empathy, tolerance, openness, cooperation, organizational skills, independence, self awareness, self-confidence, meta-communication, adequate behaviour in social situations, communication, participation in the institutions of democracy, representation. Training and mentoring accompanied the programme packages thus facilitating the use of the modules. Now these materials representing a new way of thinking are used in 600 schools.

In the framework of central development Educatio Public Benefit Company created a central digital database of digital teaching materials and teaching aids called Sulinet Digital Knowledge Base. In the cultural domain *Man and Society* training materials were prepared for the following subjects: history, the study of man, European Union, citizenship and human rights. This knowledge base, however, is not user-friendly enough and therefore the advantages of digitalisation cannot be fully exploited, and as of today it does not support innovative, activating ways of organizing work in the classroom.

Plans, problems to be solved in integrating key competences.

In Hungary a significant part of the European development funding will be used for improving public education, creating the conditions for and disseminating competence-based education in the period of 2007-2013 as well. Recent developments are aimed to increase the effectiveness, quality and efficiency of education. One of the tools for modernising educational culture is to develop further programme packages and disseminate the methods, tools, e.g. ICT essential for the institutional implementation of the new methods. Another important tool of development is the involvement of school maintainers and their partners and the modernisation of services and institutional developments. Besides the developments influencing classroom practice directly, training of experts facilitating the efficient, quality implementation of existing or modified educational programmes supporting the implementation processes is also part of the programme.

Creating a context supporting educational practice is one of our plans. The elements of such a context is: acquiring competence-based information for measuring performance and evaluating institutions, feeding this information back, and developing quality management systems in public education. Resources are available for improving the infrastructure context of the educational system (renovating old, and building new schools). It is very important that these improvements go together with the necessary professional (content, methodological) developments and facilitate their implementation, as this is the only way to increase the effectiveness and efficiency of education. (TÁMOP 2008)

References

Nemzeti alaptanterv, (2007). http://www.okm.gov.hu/main.php?folderID=723&articleID=229605&ctag=articlelist&iid=1

Horváth Zsuzsanna-Lukács Judit (2006): A kétszintù érettségi vizsga: In: Horváth Zs. Lukács J. (szerk) Új Érettségi Magyarországon, OKI 2006. http://www.oki.hu/oldal.php?tipus=cikk&kod=Uj_Erettsegi-02_Horvath_Lukacs_A_ketszintu (2008.04.16.)

Horváth Zsuzsanna – Lukács Judit 2006b: Kevesebb kudarc több önbizalom. InDemeter K. (szerk): Kompetencia, OKI 2006. http://www.oki.hu/oldal.php?tipus=cikk&kod=kompetencia-09_kudarc_onbizalom (2008.04.16)

OKM (2007): Módszertani ajánlás a nem szakrendszerù oktatás megszervezéséhez az 5-6. évfolyamon http://www.okm.gov.hu/main.php?folderID=723&articleID=229398&ctag=articlelist&iid=1 (2008. 04. 16.)

Pála Károly (2006): Kompetencia alapú oktatási programcsomagok fejlesztése Magyarországon InDemeter K. (szerk): Kompetencia, OKI 2006. http://www.oki.hu/oldal.php?tipus=cikk&kod=kompetencia-08_programcsomagok (2008.04.16)

Kerettanterv az alapfokú nevelés-oktatás bevezetò és kezdò szakaszára. Kerettanterv az alapfokú nevelés-oktatás alapozó és fejlesztò szakaszára http://www.okm.gov.hu/main.php?folderID=390&articleID=231081&ctag=articlelist&iid=1(2008.04.18)

TÁMOP (2008): TÁRSADALMI MEGÚJULÁS OPERATÍV PROGRAM 3. prioritás: A minòségi oktatás és hozzáférés biztosítása mindenkinek Akcióterv 2007-2008. http://www.nfu.hu/download/6895/TAMOP%203%20r%C3%B6vid%20AT_0218_jav.pdf (2008.04.16.)

Oktatási informatikai stratégia, OKM, (2004). http://www.okm.gov.hu/main.php?folderID=734&articleID=322&ctag=articlelist&iid=1

Available support: the role of educational research

Key competences

— *Ljudmila Ivšek*

The key competences are the transferable, multifunctional knowledge, skills and attitudes that all individuals need for personal fulfilment and development, social inclusion and employment. These should be developed by the end of compulsory education and should act as a foundation for further learning as part of lifelong learning.

A key competence needs to be seen as an outcome if it is to be grasped as a directive in gaining knowledge in any kind of context, but with regard to every individual in a society.

Recommendations of the European Parliament and Council

The recommendation of the European Parliament and Council of 18 December 2006 on key competences for lifelong learning, published in The Official Journal of the European Union, states in its preamble: *"This Recommendation should contribute to the development of quality, future-oriented education and training tailored to the needs of European society, by supporting and supplementing Member States' actions in ensuring that initial education and training systems offer all young people the means to develop key competences to a level that equips them for adult life, and which forms a basis for further learning and working life, and that adults are able to develop and update their key competences through the provision of coherent and comprehensive lifelong learning." (L 394/10, page 13)*

European Parliament and European Council recommend that "Member States develop the provision of key competences for all as part of their lifelong learning strategies, including their strategies for achieving universal literacy..."

With a European Reference Framework educational systems of Member States should therefore ensure that:

1. initial education and training offers all young people the means to develop the key competences to a level that equips them for adult life, and which forms a basis for further learning and working life;
2. appropriate provision is made for those young people who, due to educational disadvantages caused by personal, social, cultural or economic circumstances need particular support to fulfil their educational potential;
3. adults are able to develop and update their key competences, or their knowledge and skills due to the civic needs throughout their lives;
4. appropriate infrastructure for continuing education and training of adults with a special emphasis on the teachers and trainers is in place;
5. coherence of adult education and training provision for individual citizens is achieved

through close links with employment, social, cultural, innovation and other policies and through collaboration with social partners and other stakeholders. (L 394/10, page 11)

A Reference Framework of eight key competences

1. Communication in the mother tongue;
2. Communication in foreign languages;
3. Mathematical competence and basic competences in science and technology;
4. Digital competence;
5. Learning to learn;
6. Social and civic competences;
7. Sense of initiative and entrepreneurship;
8. Cultural awareness and expression.

A Reference Framework contributes to Member States' efforts to develop their education and training systems, to facilitate peer learning and the exchange of good practices on both micro and macro level, and to follow up developments, progress, the acquisition of key competences and efficiency of education and training programmes.

The path from the European document to its implementation on the national level is the one each Member State has to choose on its own; for example, each country decides on the national framework of key competences to be included in the system of education and training. Based on the recommendations of experts, the National Policy finally makes decisions about which key competences to develop in view of the social and cultural context.

Tri-layered structure of key competence

By structure, key competences are to be understood as a combination of three elements: (1) knowledge, (2) skills and (3) attitudes (also bearing) – managing one's knowledge, an attitude towards gaining it, in other words, one's own attitude towards oneself as an individual in the process of education, and one's attitude towards the subject, or subject of study; for instance,
an attitude towards Slovenian language as one of the subjects in the school curriculum. In short, key competences are what the learner knows, what he can do and what he is able to understand, think about and reflect upon.

If we see key competences from this angle, we can observe that the monitoring of each individual's process of learning increases and in this way his responsibility towards learning, and knowledge as a special value.

The structure of competence is illustrated with the first competence – Communication in the Mother Tongue – as entered in the document. A report on the two-day workshop key competences' Development and Implementation in the Republic of Slovenia (30 and 31 March 2005) states: "The question of the name for the first key competence Commu-

nication in the mother tongue still remains open; in our environment Communication in Slovene would be more appropriate and acceptable. "After consulting with the Group B coordinator (Tapio Saavala) from the European Commission and based on the Focus Group report – a group of experts that assessed the document of eight key competences (June 2005) - in reality this is communication in the mother tongue although it is not the language of the state, or official language of one particular country. We can also read in the footnotes of the document, published in UL EU that the mother tongue is not necessarily an official language of a Member State, but that it is absolutely necessary for each individual to communicate in the official language of the country he lives in. It needs to be emphasized that immigrants who come to Slovenia learn Slovene as an official language and not as a foreign language.

Definition:
Communication in the Mother Tongue is an ability to express and interpret contexts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing), and to interact linguistically in an appropriate and creative way in a full range of societal and cultural contexts; in education and training, work, home and leisure.

Essential knowledge, skills and attitudes related to this competence:
Communication competence results from the acquisition of mother tongue, which is intrinsically linked to the development of an individual's cognitive ability to interpret the world and relate to others. Communication in the mother tongue requires an individual to have knowledge of vocabulary, functional grammar and the functions of language. It includes awareness of the main types of verbal interaction, a range of literary and non-literary texts, the main features of different registers and styles of the language, and the variability of language and communication in different contexts.

Communication in the mother tongue is a key competence although sometimes it is hard to understand that the mother tongue is complicated; for instance in a family with a few mother tongues, it is up to each individual to choose which language is the mother tongue for him (a child adopts the mother tongue from the person who spends most time nurturing him and bringing him up – in most cases that is his biological mother, but not always). This kind of choice is important for each individual, because plurilinguism of each individual in the knowledge society begins with mastering the mother tongue, but also any kind of other knowledge is gained an shaped by the language – in the mother tongue or through it.

An individual has to have an ability to communicate in oral and written form, and to interact linguistically in an appropriate way in a variety of situations, as well as monitor and adopt his own communication to the requirements of the situation. This competence also includes the ability to write and read different types of texts, search, muster and process data, use aids, formulate and express own arguments in a convincing way appropriate to the context.

A positive attitude towards communication in the mother tongue involves a disposition to critical and constructive dialogue, an appreciation of aesthetic quality and willingness to strive for them, and an interest to interact with others. This implies an awareness of the impact of language on others, and a need to understand and use language in a positive and socially responsible manner. (L 394/10, page 14)

In the Reference Framework all key competences are equally important and are interconnected in a holistic sense. Key competences are those needed for personal fulfilment and development, active citizenship, social cohesion and employment.

Competences in formal education

Competences in formal education can be understood as a global aim of education, or even better, as basic directives which tally with the directives of society as a whole.

A general problem in education nowadays is due to the fact that a competence-focused curriculum requires a major shift in methodology and understanding of teaching and learning in relation to all target groups in the curriculum. The concept of competences is based on the learning philosophy that includes the following elements: active learning, participation, cooperation and interaction, focus on students' needs and interests, differentiated learning, critical thinking, teacher-student partnership, "transparent" testing and assessment.

Communication in the Mother Tongue Competence

Communication in the mother tongue (for the majority of Slovenian students Slovene) as a key competence is materialized in school practice in Slovene as a subject and Slovene as language across the curriculum.

In pedagogic speech language across the curriculum goals are achieved in both elements – cognitive and interactive. In the cognitive, a teacher or a student communicates ideas and discoveries of a particular subject, and in the interactive, we talk about the teacher-student, student-student(s) relation. The readiness or motivation of students to take an active part in the learning process and acceptance of cognitive speech depend greatly on the efficient use of interactive speech, which undoubtedly has an effect on a successful performance and achievement of goals. Interactive speech comprises motivation, identifying pupils' interests, readiness to take an active part, teachers' encouragement, commendation, etc. Therefore, it is mainly the interactive speech that builds and shapes student's image and self-esteem.

When a teacher uses language across the curriculum appropriately, he forms a concept of a scientific discipline of the subject, which is also true for a teacher of Slovene, but at the same time he forms a concept of teaching and learning. A student - a partner in this edu-

cational process - accepts a scientific concept of a certain subject and develops professional language and his attitude towards it through a teacher's cognitive speech. In interactive speech, a teacher raises awareness about the role and importance of language in personal and cognitive development of an individual in a knowledge society that does not neglect a social and economic role of the language.

A language competence is the key to learning and teaching of all subjects. By introducing concepts and specifics of scientific disciplines, each subject contributes to students' understanding and thinking. From this standpoint, each teacher is also a language teacher, and teachers of all subjects take full responsibility for developing students' communication competence within the framework of general and specific aims of each subject.

Language across the curriculum

Language across the curriculum is a cross-curricular competence requiring commitment and dedication from all the teachers in the process of education.
One day we might talk about an autonomous curriculum of language across the curriculum as a common communication paradigm in all subjects. If this should happen, the convergences in aims, content and methodology will have to be identified, and an integrated communication approach to language or the development of communication competence of an individual will have to be formed.
Special approaches to designing a curriculum for language across the curriculum as common communication paradigm will comprise:

- materializing communication as transferable competence, to which all school subjects contribute;
- teaching communication in all its dimensions (receptive and productive, oral and written; communication and interaction);
- teaching diverse means of communication (verbal, non-verbal, language-based, image-based, sound-based);
- discussing a wide range of texts: artistic (literature, film, theatre, music, fine arts), non-artistic (mass media, digital media);
- identifying and taking into account different roles of communication (to inform, to explain, to convince, to provoke, to manipulate and disseminate aesthetic pleasure, etc.);
- identifying and taking into account different discourses (narrative, descriptive, argumentative, informative, etc.);
- applying grammatical rules in different language-in-use contexts, in a wide range of contexts (formal / informal, literary /non-literary, colloquial, dialectal, etc.);
- identifying and understanding general and special aspects of each culture;
- promoting students' interest in intercultural dialogue and evoking dialogue about multi-cultural values;
- establishing a dialogue between the reader and the text which evokes personal reactions and understanding;
- encouraging students' own critical thinking about the type of message he receives and forms;

- testing and evaluating skills and competences of oral and written communication;
- discussing students' values and attitudes related to communication and culture;
- developing strategies of self-assessment for both teachers and pupils;

A curriculum for language across the curriculum would enable an integrated communication approach to the language and the development of flexible, efficient communication competence of a learner. (F. Sâmihaian, 2006)

Aims and objectives for teaching/learning a language across the curriculum

These aims enable the development of Communication in the Mother Tongue Competence for the majority of students in Slovene. Knowledge and skills are presented and gained "through language", or its use in all subjects. Students read, write, speak and listen in all subjects throughout the learning process. Each subject therefore contributes to the students' understanding and thinking about the concepts and specifics of one particular subject and its scientific disciplines. From this point of view every teacher, even though he is not a language teacher, is a teacher of language. A teacher monitors and observes students' needs and enables them to master the language and use it, but at the same time he draws attention to his own language, which new structures and options he can present by teaching and using the language appropriately. A teacher has to be aware that the reading and writing strategies are also teaching and learning strategies.

A lot of teachers are only focused on what students know and how they can use this knowledge in their subject, but they are unaware of the difficulties students encounter in reading and understanding different texts – formal speech, maps, tables, charts, etc., or when they strive to express themselves appropriately (use social language, vocabulary, etc.). It would be unrealistic to expect that the formal language of a particular subject will develop in Slovene, but the explicit or implicit cognitive, communicative and semiotic competences specified for each subject in the curriculum can develop in every subject and not only in language across the curriculum (Slovene).

Language meta-perspective, communication abilities as competences and learning-to-learn competences are primarily materialized in Slovene both as language and as subject, but we cannot ignore the fact that all this also has a positive effect on teaching and learning in the whole school curriculum.

Not only does each subject contribute to development of students' competences, but it is absolutely necessary for all the teachers to take full responsibility for the development of a language competence within the structure and objectives of the subject they teach. Diversity in the use of methods that enhance the ability of using the language in various different ways also enhances the efficiency of the learning process.

Aims for teaching/learning a language across the curriculum are:
- developing subject-specific concepts and genres;
- developing varied strategies for learning through language use;

- developing meta-perspectives on knowledge;
- learning to learn;
- developing mediation skills (mediation, summarising, paraphrasing)
- developing cognitive academic language proficiency (L. Aase 2006)

Multidimensional texts

"Multidimensional" texts are new forms of texts. Young people communicate in new ways, through new means of communication, especially through electronic and data-based media. The concept of reading and writing has a wider meaning if new genres are included in the corpus of texts. In modern society, texts play a much more important role than in any other period before. Young people live in a world that is dominated by language and texts. These texts include both traditional and new genres, such as "multimodal" texts, consisting of language, voice and images.

There is a period ahead of us, in which we will pay special attention to accepting and creating a series of genres, and will focus on the role of language in oral and written texts, with an emphasis on understanding, that is on the semantic language level. This way we are going to ensure a better quality and efficiency of the education process.

Understanding can be perceived as a sequence of active and thought-demanding processes which primarily depend on an appropriate and efficient language performance in diverse settings. Perkins (1997) breaks knowledge down to three elements: (1) knowledge, (2) skills and (3) knowledge for understanding. I presume that this classification can be compared to a three-dimensional breakdown of a key competence (1) knowledge, (2) skills and (3) attitudes, on condition that the third element is perceived as understanding the process, the form (attitude to the form) and ourselves, how we build our knowledge (process it), therefore the attitude to our own disposition to the form, to the results of learning.

Leopoldina Plut – Pregelj (2004), an expert on teaching for understanding, has summarised three levels of understanding by Perkins. On the first level, "understanding fluctuates between naive and sophisticated", on the second "between simple and complex", and on the third "between personal and wider social". It is important to realize that the complexity of mental processes does not only include cognitive processes, but also emotions, interests, will and intentions.
The same author interprets Wiggins's six facets of understanding that students develop in the process of education as follows:

- can explain - when we can explain an occurrence; this is a so-called analytically logical approach in which we deal with objective reality;
- can interpret – when we can interpret an occurrence; a logically analytical approach is joined by linguistic emotivity, determination, willingness, readiness; learners develop their own understanding which may differ from that of a teacher or other adults;
- can apply – when we can apply it in different contexts that is why a learner has to have

enough opportunities to develop this kind of understanding by putting his knowledge into practice;
- has perspective – when understanding enables us to see different points of view on a certain subject; this is what we call critical understanding;
- can empathize – this kind of understanding concerns an individual's viewpoints; at the same time we develop ability to empathize; if we ignore empathy in class, we have no grounds for developing any kind of dialogue;
- has self-knowledge – when it is about understanding the student's own process of learning, how students get new ideas, make new discoveries;

This kind of understanding can only be developed in a group where each individual manifests his own understanding of the subject and learns to understand another individual by listening to him. The knowledge a student already has is interlinked and enhanced, but at the same time he evaluates it in the process of thinking.
Here a question is raised about how an individual with his knowledge and experiences contributes his share in the group, and what he "accepts and takes" from other members of the group, to enhance or relate his knowledge to the knowledge and experiences of others. What we see here is the process of mutual learning which is essential for the knowledge society, in this particular case on a micro level, but the same can happen on a macro level.

Formal language (content, language and thinking)

A language competence is the key to teaching and learning of all subjects. Language is a means of teaching, disclosing topics, for formulating the concept of a certain discipline, for generating knowledge of a specific area of study. The use of language in the learning process is in close connection with the learners' thought-forming; it is some sort of aid that helps them cultivate mental activities and precision/accuracy in understanding. Language is a bridge between the tasks, between internal processes to solve each task and external message formulating, or presenting solutions. It materializes in different discursive roles such as defining, describing, explaining and evaluating.

The model of specific competence of a subject area comprises (1) knowing the content, (2) knowing the process/ procedure and (3) a discourse competence. To simplify: content, activities done by students, and presentation of solutions or results.

Specific subject discourse competences (abilities) consist of:
- understanding, identifying, selecting, integrating new information, restructuring information;
- representing "reconstructed« knowledge in a new way, and cultivating mental habits of connection-making with the already existing concept network;
- formulating and presenting cohesive and coherent pieces of information;
- deducting perceptions, insights, understanding the meaning and the role in interaction with the knowledge attained in other subjects;

Language descriptors for describing a specific subject competence are:

- performances of understanding in the right terminology (in one word or more – concepts, ideas, definitions);
- the use of intelligible (scientific) formal language;
- logically structured (whole) texts;
- applying descriptions by observing the rules of description;
- stating reasons in the process of discovery, and using appropriate/cogent arguments;

Essential characteristics of formal (scientific) language are:

- language across the curriculum in relation to formal language – cognitive language of pedagogic speech;
- the canon of formal language;
- formal language in relation to practical (colloquial) language; and
- formal language serves as a foundation for developing scientific literacy (literacy = to be able to use language for a certain purpose), which has to be clear between the subjects; (H. J. Vollmer, 2006)

Formal language has its own canon which in a way differs from the informal language. This canon does not concern only the terminology, but is much more complex in that it also affects grammar, the use of appropriate and correct utterance, from the word choice to clauses or sentences, which we might not always be aware of. Formal language is very demanding for learners, because of the nominal phrases, nominalised adjectives, verbs and sentences, combinations of lexical items with word-classes or categories, cleft sentences, apposition, etc. Although this kind of combining makes utterances more coherent and intelligible, it makes texts more demanding and more difficult to understand. Very often a student encounters problems due to the concise grammatical structures of the text, which results in non-completion of the task, for instance, in mathematics. This problem cannot simply be assigned to the students' inability to read. We have to distinguish between reading for understanding and a grammatically demanding text, no matter how closely related they might be. The development of formal language leads to the development of scientific thought-forming, which is done by using a language, or grammar. *"So a technical dictionary and nominalised grammar are two viewpoints of a single semiotic process."* (T.Sajovic, 2007)

Halliday talks about different types of grammar, about the one that we can relate to and have knowledge of, and about the "hidden" one, full of metaphors, which we mainly find in the formal language. Knowing the grammar and how it works in texts, including metaphors, helps us understand texts. The "hidden" grammar helps us understand the natural language which affects unconscious understanding of an individual and the environment, but also a particular area, science, or subject matter. The grammar of simple sentence style - the use of verbal phrases and nominal phrases are complementary. Standard language is more typical in everyday speech since it helps us formulate and present our thoughts and ideas.

Nominal phrase style, typical of the non-standard language, sheds light on structures and links between their parts – together with their lexical structures or taxonomies (Halli-

day, V. Sajovic 220). The style of nominal phrases was formed from a verb phrase style by formulating grammatical metaphors. Both these styles distinguish between the written and spoken language and complement each other, which should be done by the teachers, since cognitive theories (cognitive speech) in the process of education are based on that. Holliday favours dynamic style, which is spoken word, and raises a question about the use of dynamic style in science.

This is in close connection with the pedagogic speech and understanding of cognitive and interactive speech, with a special emphasis on understanding cognitive speech and encouraging students to develop it in the process of education.

Advantages and obstacles of a competence approach

With the implementation of the competence approach in education we can expose an individual who is developing his inner cognitive competences which are manifested in different contexts. The most important thing is that it is possible for him to enhance these competences and retain them in the process of lifelong learning.

Introduction of key competences into education requires a vision

We can only succeed in introducing the key competences into our education if we set ourselves aims and goals that we want to achieve. Once this is clear, we can tackle the European document and adapt it to the national cultural and social context with a great measure of criticism so as not to end up in behaviourism, or compare key competences with aims. Development of key competences is focused on an individual, regardless of age, economic and social status, which is why the European document often mentions vulnerable groups, underprivileged groups, special needs groups, drop-outs, adults, etc.

The key competence of each individual is not a set of different competences, but an inextricably intertwined knowledge, including the attained skills and attitudes, the attitude towards one's own knowledge and oneself as the "owner" of this knowledge, how one is prepared to "cash it in", in other words, share it with others. Here individuality transcends narrow boundaries in a sense of connection, and cooperation. We are therefore talking about building a key competence of an individual who will further enhance key competences of a particular community, and a society as a whole. When discussing key competences in practice, the following issues are raised – teach each other, learn with others and learn from each other.

The trappings of introducing key competences into formal education

Introduction of key competences into an educational system does not only present a big challenge for all the education experts, but it is also a great responsibility for the future generations; that is why it needs a thorough consideration and an immediate dialogue.

Under no circumstances are we to allow a non-reflective development. We have to open discussions on different levels before we assume conscious decision-making and sensible search for a balance between the systematics and employability.

What problems might we encounter?
If we examine the strategic goals of the Lisbon Strategy, we cannot ignore the fact that education arises from social needs, and that it responds to the directives of modern economy where knowledge and its results are of great significance; therefore the knowledge of an individual as well as that of the "learning society" as a whole carries a lot of weight.
Education has to follow a holistic approach, and the results have to be oriented towards measuring the efficiency of each individual in many different areas of knowledge – testing the results of complex knowledge and not only that of a subject.
A teacher's lesson planning is undoubtedly a developmental task, since it requires daily reflection. In the new teaching paradigm, lesson planning is focused on a student as an individual and student as part of a group, on the development of his abilities as well as achieving the goals and the content of the school curriculum

Student-focused lessons encourage bigger responsibility of a teacher and student. A student is not only acquainted with the aims, but also with the criteria used by the teacher to assess his performance and measure his progress. In addition to this, it will be essential and rational to establish which competences are being built while achieving individual goals of the school curriculum, so that we can easily ensure realization of the chosen key competences, and that we can avoid overvaluing some and undervaluing others. The competence approach requires team work at planning and monitoring key competences in practice.

If a learning process is competence-based, it will interconnect certain aims and contents of different subjects, or even subject areas; it will be student-focused, focused on mastering his strategic knowledge; therefore it will require different internal and external assessment, since the testing should reflect the teaching methods as well as performance assessment and students' achievements.
New knowledge concepts require entirely different ways of learning, teaching, testing and assessing, so the teachers are facing totally different requirements.

Competences cannot be compared with aims. When we try to achieve aims, a student is building his competences which are demonstrated through different contexts. That way we proceed from individually gained knowledge towards more complex knowledge, which results in lasting knowledge. A student adopts an attitude to his own knowledge. We have to strive to preserve competences and to enhance them, which will be of great help to an individual in the process of lifelong learning.

Are we bound by the European document on key competences?

The answer to this question could be positive or negative. Each country is responsible for

its own educational system and is totally sovereign; therefore such document is not entirely binding. But each country wants to know how efficient its system of education is, how to improve it to make individuals and the whole society on a national as well as European level as efficient as possible. This is the reason why comparisons under the agreed terms and criteria are necessary for them to be efficient. An open coordination method enables mutual learning so that we can test good practices and put them into effect. The European document is a framework which will be a constant subject of discussion in politics, profession and practice.

References

Aase, L. (2006): Aims in the Teaching/Learning of Language(s) of Education (LE), Intergovernmental Conference, Strasbourg (16.–18. oktobra)

Križaj Ortar, M. (2006): Ucenceva sporazumevalna zmožnost v slovenščini. V: Vzgoja in izobraževanje 2006/1

Kunst Gnamuš, O. (1992): Sporazumevanje in spoznavanje jezika. DZS. Ljubljana.

Marentic Požarnik, B. (2006) Uveljavljanje kompetencnega pristopa terja vizijo, pa tudi strokovno utemeljeno strategijo spremljanja pouka. V: *Vzgoja in izobraževanje*, 2006, letn. 37, št. 1, str. 27–33.

Perkins, D. (1998): What is understanding? V: Teaching for Understanding. (M. S. Wiske, ed.) San Francisco: Jossey-Bass Publishers.

Plut Pregelj, L. (2006) Znanje z razumevanjem – temeljni cilj vsake šole. V: *Slovenščina v šoli*, 11, 3–4, str. 36–49.

Sajovic, T (2007): Paradoksnost kvantnega sveta in jezik. V: Proteus 69/5, str. 213–220, Prirodoslovno društvo Slovenije, Ljubljana

Sâmihaian, F. (2006): Content Considerations for a Framework of Reference for Language(s) of School Education, Intergovernmental Conference, Strasbourg (16.–18. oktobra)

Skela, J. (1998): Komunikacijska metodologija poucevanja jezikov. V: Usvajanje in ucenje jezika. Uporabno jezikoslovje. Ljubljana.

Vollmer, J. H. (2006): Towards a Common European Instrument for Language(s) of Education, Intergovernmental Conference, Strasbourg (16.–18. oktobra)

Priporocilo Evropskega parlamenta in Sveta z dne 18. decembra 2006 o kljucnih kompetencah za vseživljenjsko ucenje (2006/962/ES) L 394/10;

Hellenic national report on key competences

— *Dr. Christos Doukas and Dr. George Palios*

Introduction

The Hellenic National Report is based on the analysis of two cross-curricular competences (Digital Competence and Learn to Learn Competence) in relation to a thematic Competence (Physics Competence). The rationale behind this analysis is that the cross-competences have common characteristics (criteria), which are connected in specific ways with each thematic competence regarding its conceptual and methodological dimensions. However, the analysis of their interrelation could lead to a model applicable in different competences along the curriculum as well as general conclusions concerning competences
For this reason the analysis identifies criteria for each selected competence and explores if and how they are embedded in the legal texts. As legal texts it is considered to be the official documents of the National Curriculum and the respective Educational Material (textbooks). Furthermore, strategies/obstacles are investigated and finally future prospects are examined. The two last parts are non-restricted to Physics Education but are extended to general policy issues concerning competences.
Specifically the report is structured along the following parts:

- A short description of the Hellenic Educational System and the organisation of competences within it.
- An identification of criteria for the three selected competences according to the recent key competences for Life-Long Learning discussion in the EU. The Cross- Curricular Competence in relation to the Thematic Competence (physics) is investigated in the areas of the Hellenic Curriculum and Educational Material
- Strategies/obstacles in the design and implementation periods
- Strategies for the near future

Short description of the Hellenic Educational System
Hellenic School education is provided at three levels: Primary education (5-12 years old) and Lower Secondary Education (12-15 years old). These two levels constitute the compulsory education. Upper Secondary Education (two types: General Lyceum and Technical-Vocational Lyceum)
Students' assessment is internal for all levels. At the end of the General Lyceum students have to take an external national examination in order to receive the Baccalaureate and to be accepted by the Institutions of Tertiary Education.

The Pedagogical Institute prepares School curricula for all levels.
Since 2003 a new curriculum named "Cross-Thematic Curriculum Framework" (CTCF) has been introduced and is being implemented gradually (to be completed by 2008-09). It includes the broad aims of compulsory education, the general objectives for each level

and each course of disciplines. This curriculum is structured around subjects, which are interconnected through main concepts such as change, balance, etc aiming to promote the development of meta-cognitive skills. Within the general aims of curriculum the "learn how to learn" and the "positive attitude toward learning" are clearly stated.

The courses are as follows:

Primary education: religious education, modern Greek language, mathematics, history, science, geography, aesthetic education, English language, physical education, social studies and civics.

Lower secondary education: the main courses remain the same. Additional subjects such as technology, second foreign language and ICTs are introduced. ICTs are taught separately as well as in combination with all subjects. All the educational material introduced recently includes appropriate software for each subject and grade. The science lessons such as physics, chemistry and biology are taught separately.

For each subject there is a general framework for compulsory education as a part of CTCF and a more detailed description, the "Individual Subject Curricula" (ISC), where the specific objectives, the content, and the methods of assessment for each subject, level, grade and teaching unit are presented. Indicative direction concerning activities, means and methodologies are included as well.

Educational material and timetables: the educational material is common for all schools and it is produced under the supervision of the Pedagogical Institute. It includes student textbook, notebook for exercises, laboratory guide (for sciences), software for school and homework and teacher's guide. The material is unique for each subject and grade.

The timetable is common as well. All schools have the opportunity to devote part of the time schedule to activities decided by each school unit (flexible zone). The environmental and health education activities consist part of taught subjects but they are carried out supplementary as extra curricular activities voluntarily after school.

Key-competences: Criteria and Interrelations

The basis for the identification of criteria for the key competences is the background of the working group of the EU (EU, 2002). This background is enriched by related basic policy documents on the field (Eurydice, 2002, OECD-DESECO, 2005, EU, 2006 PISA, 2006). The purpose of this work is not to explore the theoretical aspects but to define a description on research-based policy documents regarding the formulation of criteria for policy and practice implementation of the competences.

Physics Competences

In the relevant working group document, physics is incorporated in science education. The definition given is that *"scientific competence is the ability and willingness to use the body of knowledge and the methodology employed in the field of science to explain the natural world"*. Furthermore the competence is analyzed into its three elements, which are knowledge, skills and attitudes. The Hellenic report is focused on Physics Education since science education in the Hellenic Curriculum is divided in separate subjects and their common study would need a more extended analysis.

Taking into account the working group elements and a broad base of an ongoing discussion on science competence and especially the PISA context (PISA 2006), we identify the following criteria of physics competence:

Knowledge

- Understanding of fundamental concepts to explain the physical world
- Knowledge of scientific methodology (pose questions, predictions, experimentation, theorising, evidence-based conclusions)

Skills

- Skills of problem solving, analysing, critical reasoning and creative skills, communication abilities
- Application in life-situations
- Laboratory skills

Behaviour

- Interest and positive dispositions
- Critical appreciation and support for Physics inquiry
- Respect and responsibility towards resources and environment

In this context, science literacies appear as a complex combination of reasoning, data processing, phenomena, concepts, social attitudes and values reflected in scientific discourse. The modes of communication used in scientific discourse are not just verbal, but they also include visual representations and socio-cultural interaction (Lemke, 1998, Osborne 2003). With reference to Lemke, science literacies involve such a complexity of concepts that the "physical language" alone proves inadequate to express and communicate the various aspects of science architecture. Consequently the access to scientific language presupposes a wider scale of literacies/multiliteracies (Cope- Kalantzis, 2000). The multiliteracies refer to the competences of comprehension and the design of new meaning via the diverse multimodal semiotic systems. Their structure leans upon the synergy of various symbols representing elements, quantities, entities, graphs and maps depicting quantitative relationships, taxonomies, time and space, data tables, mathematic expressions etc. Specifically Physics Educations in order to explain physical phenomena is better represented by a multimodal "language" through the convergence of oral, printed and visual channels of communication which are main characteristics of the digital competence. For this reason digital competence is a constituent element of physics competence.

All the above stated lead to some implications for physics education: That it is necessary for all people to acquire and develop the competences for processing the information presented in multisemiotic systems as well as to build physics literacies on the stable grounds of positive attitudes/dispositions towards scientific discourse. These dispositions carry properties such as «open mindness", inquiry, familiarization with the unknown, imagination, creativity and collaborative spirit (Carr-Claxton, 2002, Allal, 2002, Perkins-Jay-Tishman, 1993, Klopfer, 1976). These dimensions are mostly connected with the "Learning to Learn" competence. For this reason the competence (Learning to Learn) is an essential one in the development of Physics competence.

The interrelations between the two cross-curricula competences and the thematic competence (physics) will be further examined in the following parts.

Digital Competence in Physics

According to EU working groups, competence in the use of digital science is the "use of multimedia technologies in receiving, storing, producing and exchanging information". The ICT competence includes three elements: knowledge, skills and attitudes.

Specifically the compulsory education graduate should know about :

- Main functions of a computer
- Word Processing
- Spreadsheets
- Internet
- Electronic Mail
- Data base
- Information Storage Management

Knowledge

Be able to :

- Manage large amounts of information and to discern relevant and crucial pieces of information from irrelevant, superfluous or wrong pieces of information
- Communicate via email
- Visit and possibly create websites

Skills

Have the ability to:

- Work on one's own or in groups
- Look for and approach each piece of information with a critical mind
- Be aware that he/she should not approach information beyond acceptable morals and good taste
- Have the capacity to discern accessible from acceptable
- Treat personal matters with sensitivity

Attitudes

Based on the above criteria digital competences related to physics competence could be identified as follows:

Knowledge

- In-depth Knowledge
- Processes knowledge (multi-modal representations)

Skills

- Critical ICTs use for information management
- Communication via Internet

Behaviour

- Increase interest
- Communication networks

Learning to learn competence in Physics

The Working Group offered the following definition for "learning to learn" (EU, 2002): "...the disposition and ability to organize and regulate one's own learning, to manage one's time effectively; to solve problems; to acquire, process, evaluate and assimilate new

knowledge; and to apply new knowledge and skills in a variety of contexts-at home and at work, in education and training..."

With reference to this definition, it is possible to assume indicative criteria for this competence within physics education.. For this reason we studied common reference points in some other policy documents (Hautamaki J., et.al., 2002, OECD-DESECO, 2005, PISA, 2006). In this context cross-competence of Learning to Learn could be identified through the following criteria:

Knowledge

- Basic Concepts
- Processes for acquiring new Knowledge

Skills

- Application in new situations
- Self-management of knowledge (autonomous learning)

Behaviour

- Positive dispositions
- Persistence on tasks
- Group cooperation

The three competences are represented in the following diagram:

Key competences (Physics – Digital Competence – Learning to learn)			
Key Competences / Elements of key competences	**Digital Competences**	**Learning to Learn Competences**	**Physics Competences**
Knowledge	- In-depth knowledge - Processes knowledge (multi-modal representations)	- Basic concepts - Processes for acquiring new knowledge	- Understanding of fundamental concepts to explain the physical world - Knowledge of scientific methodology (set questions, predictions, experimentation, theorising, evidence-based conclusions)
Skills	- Critical ICTs use for information management - Communication via Internet	- Apply in new situations - Self-management of knowledge (autonomous learning)	- Application in life-situations - Laboratory skills - Skills of problem solving, analysing, critical reasoning and creative skills, communication abilities
Behaviour	- Increase interest - Communication networks	- Positive dispositions - Persistence on tasks - Group cooperation	- Interest and positive dispositions - Critical appreciation and support for Physics enquiry - Respect and responsibility towards resources and environment

The competences and their criteria/elements are stated targets in the general guidelines for each thematic competence in the Hellenic Curricula for Compulsory Education. Specifically in the "Cross-Thematic Curriculum Framework" (CTCF) the guidelines for the organization of thematic competences are defined to be:

- Knowledge and Methodology which includes content and processes of each domain as well as cognitive skills for acquiring new knowledge
- Skills of cooperation, communication, logical reasoning, demonstration, management of information, application in life situations.
- Behaviours and values concerning interest, persistence, readiness etc

More concretely:
The general part of CTCF sets the priorities for educational system. The "access to lifelong learning" and the "development of a critical attitude towards new information and communication technologies" are the 2nd and 3rd priority (CTCF, p.10).
These competences are also included in the general aims of education:
Under the aim b "to develop pupils' skills, abilities and interests" (DEPPS, p.11), the "learn how to learn" and the development of a positive attitude towards knowledge acquisition are considered as the main aim of school education (CTCF, p.12).
The general aim f "prepare pupils to explore new information and communication technologies" (CTCF, p.11), is further described "the pupil will be prepared to critically access "information society" as well as "knowledge society" (CTCF, p.14). For that purpose educational software was developed for each one individual subject.
These general aims and priorities are specified in the "individual subject curricula"(ISC), (CTCF, p.14). The digital competence is delivered as a separate subject and it is promoted in all individual subjects.

Digital competence in Physics Legal Texts

Main directions of Information and Communication Technologies in compulsory education
In order for compulsory education graduates to know and use digital information effectively, school curricula include ICTs, which is taught as a separate subject in lower secondary school, and through diffusion of ICT knowledge and skills into other subjects throughout primary school. One of the aims of the CTCF for ICTs , mentions that "The aim of teaching ICTs in compulsory education is for pupils to acquire an introductory but global understanding of the operating principles of a computer, in the context of technological literacy and recognition of Information and Communication Technology, while developing broader capacities of critical thinking, ethics, social attitudes and behavior, as well as disposition towards creativity at a personal as well as cooperative and team level."

Information and Communication Technologies (ICTs) in Compulsory Education
To enhance the capacity of compulsory education graduates to use digital technology, use of ICTs is included in school curricula and teaching textbooks. At the same time, the attainment of teaching aims of other subjects is facilitated by the use of ICTs. In particular, the CTCF and ISC for Physics and Chemistry mention *"the attainment of aims is undoubtedly assisted by the use of new technologies. New teaching tools (educational software, Internet, systems of reception and representation of measurements) multiply students' capabilities to collect, analyze, visualize, model and announce data, so that students, by their own active participation understand basic laws and principles of Physics and Chemistry"*.

Curriculum Aims. The Physics curriculum for Lower Secondary Education includes activities, experimental work, projects, which are carried out using ICTs. Teachers are encouraged in their didactic methodology to use digital material during the teaching process. ICTs are mentioned in the CTCF and ISC for Physics at the following points:

References in CTCF and ISC for Physics				
Grade	Reference	Page	Notes	Relevance
B	Use of IT for table graphs and experimental data processing, including measurement and mathematical relations describing relations among physical quantities	530	APPS:Activity	Knowledge - Word Processing - Spreadsheets
B	Graph analysis of rectilinear motion	530	APPS:Experimental work	Knowledge - Word Processing - Spreadsheets
B	Study of motion-rest, uniform and changing velocity, with activities which use postion sensors.	530	APPS: Activities with Position-time and velocity-time graphs	Knowledge - Word Processing - Spreadsheets
B	Study of temperature variation (using temperature sensors) of two bodies in thermal contact	532	APPS: Experimental work	Knowledge - Word Processing - Spreadsheets
B	Based on the sun clock, students do library or Internet search about the ways humans used celestial bodies' movements for measuring time.	534	APPS: Suggested project:"Time-Measuremnet of time"	Skills - Discernment for vital and relevant information - Website visit Attitudes Search and critical approach of information
B	Construction of a calendar, using images and videos or other Internet and library material regarding travel of man to the moon.	534	APPS: Suggested cross-curricular project "From the Earth to the Moon (Space travel)"	Knowledge Word processing Skills - Discernment of vital and relevant information - Website visiting Attitudes Search and critical approach of available information
C	Collection of information from media, Internet, or literature regarding nuclear accidents and their consequences on human health and the environment.	537-538	APPS: Activity	Skills - Discernment of vital and relevant information - Website visiting Attitudes - Search and critical approach of available information
C	Computer or microphone aided mixing of different natural sounds.	538	APPS: Suggested cross-curricular project "Sound, music and musical instruments (From Orpheus, Pythagoras to Xenakis and Papathanasiou)"	Knowledge Use of special software
C	Attempt to produce sounds which evoke special emotions, by mixing natural sounds, so that they acquire a first experience of contemporary music writing.	538	APPS: Suggested cross-curricular project "Sound, music and musical instruments (From Orpheus, Pythagoras to Xenakis and Papathanasiou)"	Knowledge Use of special software

B,C	New pedagogical tools (software, Internet, Sytems of simultaneous reception and imaging of data) multiply students' capacitiy to collect, analyse, visualise and announce data, while with their active participation they understand some basic principles and laws of physics.	539	APPS: Didactic methodology	
B,C	Use of simulations where the student can change and study the parameters which determine the outcome of a physical phenomenon or function.	540	APPS: Didactic methodology	
B,C	Educational material and video tapes ought to complement conventional teaching material, making use of the ability to different representations of offered information. Software should include simulations for studying the factors affecting physical phenomena, experimental data and computer imaging using sensors (MBL). Software should also facilitate team work in class. It is also necessary to allow for the collection, processing and presentation of data, to be best utilised during individual and team lesson projects.	541	APPS:Didactic material for teachers	

Educational Material Targets. The following table shows the references on instructions, activities, laboratory work using ICTs, in Physics teaching materials.

References in Teaching Materials:

A. Teacher's guide:

Drade	Reference	Page	Notes
B	Computers and educational applications	48	Virtual Lab
B	Point of reference	53	Virtual Lab
B	Point of mass and position	54	Virtual Lab
B	Position and time points	56	Virtual Lab
B	Point of reference and displacement	57	Virtual Lab
B	Uniform Motion	58	Virtual Lab

B.Laboratory Guide

Class	Reference	Page	Notes
B	Rest and Motion	59	Lab Exercise MBL
B	Uniform Motion	64	Lab Exercise MBL
B	Heat transfer, thermal equilibrium, Conservation of energy	69	Lab Exercise MBL

We should note that ICTs in Physics teaching are used mainly in order to extract information via the Internet, to create simulations and virtual laboratories, to perform experiments with simultaneous reception and sensor imaging (MBL). Simulations and systems of simultaneous imaging are recommended when teaching time is very limited, for experiments in which measurements would be too time consuming or for experiments in which physical quantities change too rapidly, in general, whenever conventional lab work is not easily performed.
In order to equip schools with digital material, 27 CD in Physics and related subjects have been distributed to all school units.

Learning to learn Competence in Physics Legal Texts
In relation to Physics, the Learning to Learn competence can be approached according to the following elements:

Knowledge
Basic Concepts
Curriculum Aims. In the Physics "Individual Subject curricula" (ISC) there is no declarative statement on key or fundamental competences of the domain. However the general aims of the domain focuses on "theories, laws, principles and concepts" which are connected to the life-long learning development of pupils in personal and social life and for their participation in public scientific communication and understanding (ISC, 443). The emphasis is on understanding, explaining, interpreting, applying concepts in physical situations
Educational Material Targets. They are organized along fundamental concepts like Veloc ity, Force, Work, Energy and its types. For the coherence of the approach the key- concept of Energy is taken as an overarching-unifying concept for the understanding and exploration of physical phenomena. The emphasis on the core-concepts is characteristically demonstrated through the description of the concrete targets of Physics. The description is identified by verbs like "recognize", "become familiar", "understand", "relate", "appreciate", "apply", which are the descriptors of the approach to the content knowledge (ISC, 526-528).

Processes for acquiring new Knowledge
Curriculum Aims. In the Physics ISC it is declared as basic aim of Physics Competence the "familiarity of pupils with the scientific methodology (observation, management of information, generation of hypotheses, experimental investigation, analysis and interpretation of data, submission of conclusions, generalization and modeling)" (APPS, 443). This is a crucial methodology for creating Learning to Learn competence across the Physics discipline
Educational Material Targets. In the introduction of the educational material a specific reference clarifies the scientific methodological approach. Moreover, the textbook presentation of the content is organized along the scientific methodology (observation, questions, conceptualization, experimentation, analysis and explaining, transfer of learning in life-situations through activities etc).

Skills

Apply in new situations

Curriculum Aims. As is demonstrated in the ISC of Physics the aims of the Competence focuses in the promotion of skills of setting questions, of investigating, transferring knowledge in life situations, systemic thinking skills, evidence-based conclusions, argumentation, communication skills etc. According to the General Aims of the discipline the emphasis is on Life-Long Learning for a future citizen able to participate and change life conditions for the improvement of natural and social environment (ISC, 443)

Educational Material Targets. These general aims are more identified in the educational material. Many applications from life-situations are documented, for example many references in phenomena like the ozone depletion and its consequences, the green-house effect on the planet, activities about technology applications in daily life electric devices, simple technological construction embedding physics concepts etc (Textbooks of Physics B and C Grades for Lower Secondary).

Self-Management of knowledge (autonomous learning)

Curriculim Aims. It is stated in the CTCF that the constructivist approach is the basis for building the skills of autonomous learning. Specifically in Physics the skills of planning, experimentation, application, evaluation is a declared aim. Finally the contextualization in real world situations is also stressed in the aims.

Educational Material targets. Although the meta-cognitive skills of self-management are not referred as a concrete target in ISC, the enhancement of these skills are evident in the organization of learning in the education material through laboratory activities, questioning, real life contexts etc.

Behaviour

Positive dispositions. Persistence on tasks. Group cooperation

Curriculum Aims. As already has been argumented this competence is identified in the general guidelines for all the competences (CTCF, 10). In the domain of physics there are references in the promotion of "the disposition of persistence, of acquiring aesthetic values concerning the relations with nature, the communication and cooperation with other people" (ISC, 443)

Educational Material targets. Evidence of this competence could be identified in the education material in the following areas:

- alternative concepts/ideas of pupils related to daily experiences (concepts of force, gravity, velocity, energy, temperature and thermal energy etc)
- presentation of phenomena through photographs, pictures etc which are constituents of content description
- connection with life situations and especially with technology advancement
- an explorative approach
- questioning methodology
- team-working
- experimental work laboratory-based

Strategies/Obstacles in the Design and implementation periods

Policy Makers

The issue of incorporating the key competences in the curriculum is not a technical one. It is connected to educational and social aspects. It has to be based on pedagogical aspects, learning and didactic approaches. Moreover it has to be based on the cultural and organisational dimensions of each community. It is correlated with a "whole system approach" concerning curriculum changes and teachers's professional development. In this context the main strategic points at designing and implementing the competences changes have been the following:

- A crucial point in the Hellenic case was to organise competences in unified ways thought out compulsory education. In this context the relative competences have been developed in a spiral mode along three areas: Structure of matter, Energy transformations, Forces and Motion.
- A second point was the elimination of the knowledge content in order to avoid the overloaded education material.
- The cross-curriculum aspect of competences was based on the so-called cross-thematic approaches (systems, models, change and stability, time-space etc). This interconnection added a new dimension to the competences. The influences of this approach have to be carefully evaluated regarding its effectiveness.
- Time is a crucial parameter for the success. The emphasis on competence-based curriculum demands more time for acquiring higher order competences. As a result the transition from facts-based learning to competences-based presupposes changes not only in the curricula organisation but also in the culture of learning.
- The centralization of the Hellenic educational System is another crucial variable. Although this type of school organisation is supposed to promote "equal opportunities for all", it is not for sure that this goal is fulfilled. This is due to the expanding diversity of school population for which uniformity may be not the better approach. This is an important aspect as far as it is connected with policy issues like the dominance of the single-state textbook for each subject. Once again this is an educational measure aiming at the equality of results but it is a necessity to reconsider its impacts on an environment of diversity, rapid changes and new technologies tools.
- Another difficulty met in the introduction of the new competence is the role of the assessment system, which is dominated by the national exams for the entrance in Higher Education. This selective system poses specific demands on knowledge accumulation that are not always compatible to many pedagogical, learning and assessment innovations introduced at earlier levels of education. Assessment methodologies are crucial for the incorporation of new competences and especially the process-based dimension. Traditional assessment tools are not always the appropriate means. Alternative tools are necessary especially in competences like Learning to Learn.

Besides these aspects what counts more in the competences agenda is the "how" of its implementation. Surely the processes of its implementation matters the same as the content of the curriculum changes. Specifically any top-down process has limited opportunities

to change the pedagogical relations within the school communities. As a result a debate process was followed from the early stages of the elaboration of the curriculum. Targeted informative meetings have been taken place in all Hellenic Regions regarding the main points of the curriculum.
The new textbooks were introduced this year after an in-service seminar for all teachers.
Concerning the ICTs introduction in schools: even though much digital material has been sent to schools, new technologies are hardly used in class. Teachers are sceptical about using it. A large number still find difficulties in using ICTs in classroom. Computer literacy rates vary but tend to be lower among humanities' teachers. Efforts have been made to train teachers in ICTs but results are not yet visible.

Trainers of Teachers

As already noted, training of teachers was an element of the new curriculum/materials. The trainers were consultants, the authors of the new textbooks and experienced teachers. They have been trained themselves by the Counsellors of the Pedagogical Institute.
The training of teachers was not restricted to the few days seminars. It is also incorporated in main in-service activities of teachers like the in-service training for newly appointed teachers, as well as the seminars carried out by consultants in the regional/provincial level. However, the long-term reflection of teachers for the ownership of the new contents and processes of the curricula/teaching materials is considered to be a necessity.
Concerning ICTs an effort has been taken during the last few years for an extensive in-service training of teachers but the results are not visible so far. It is considered necessary for the future training courses to focus more systematically on the educational uses of ICTs in practice.
Generally speaking according to the recent research of PI about quality in education, the professional development system lacks a systematic approach in areas like coherence and continuity, which are necessary elements of a LLL approach. Moreover, there is a need for closer links between in-service training and school improvement as well as incentives for teachers.

Schools/teachers

Since the ISC in Physics has been introduced during the year (2007-2008) it is premature to come to conclusions on the impacts at teachers/schools level. For a more systematic evaluation of these impacts a research is scheduled to be carried out at the end of this year concerning curriculum changes and the new education material. The research is based on the replies to a questionnaire prepared by the PI distributed to teachers, pupils and consultants. It is a quantitative research carried out in schools of Primary and Secondary education.
A second research is carried out by PI concerning the "Evaluation of qualitative and quantitative characteristics of the Hellenic System of Primary and Secondary Education" (PI, 2006). It is a two years research (2006-2008) in the main nine domains of school education. It took place in 100 schools of primary and secondary education. It aims to evaluate and to set targets for the quality of the educational system.
These two studies are the research background for redesigning school education during

the new action plan 2007-2013.
All Schools are equipped with computer labs. However, these facilities are inadequate for the increased needs of all subjects. Moreover, most teachers do not necessarily wish to use new technologies to aid their teaching. This obstacle could be overcome if one laptop and a projector were available in each classroom. Broadband facilities are also poor, since access is not available for every classroom. Furthermore, many teachers believe that they should first teach conventionally and use ICTs afterwards for better understanding. As a result of which, time always runs short to cover the whole syllabus. So, it is imperative that teaching instructions sent to schools should include lesson plans with ICTs use.

Strategies for the near future

This period is an extensive consultation period for the implementation of the new planning in education within the so called National Strategic Reference Framework (ESPA, 2007-2013). A central issue in the new planning is the *"upgrading of the curriculum in Primary and Secondary education and specifically in the context of new technologies and equal opportunities in education"* (ESPA, 2008). Although the final detailed plan is not yet accomplished some reflections of the new policies could be presented:

Decision makers
- Clearer targets in the definition of competences. Possible changes will be implemented after the concrete results of the research on the new curriculum are accomplished.
- Focus on key-competences instead of length of content in order to release time for higher order learning
- Reflective and flexible modes of organisation of KC - validation of competences
- Priority in deepening the involvement of ICTs in teaching/learning with an emphasis on web-based instruction
- An emphasis on the motivation in Physics Learning. This issue is an important one in order to make science more attractive for all pupils.
- Assessment as learning new modes of assessment to promote feedback and positive behaviour in physics education (authentic assessment, portfolio, descriptive assessment, performance assessment, self-assessment questionnaires etc)
- Enhancement of a more autonomous and LLL perspective in physics/science and the whole curriculum. An important dimension of this target is the interrelation between formal, non-formal and informal learning environments
- Process-based changes. Instead of a top-down approach, new policies promote a double way process both bottom-up and top-down

Teacher trainers
- The general target is the empowerment of human and social capital of schools in order for them to take over a participative and more decisive role in the educational system.
- Professional Development of Teachers is considered an important challenge. The respective redesign of training of teachers is based on a coherent system embracing initial

education, in-service training after the appointment and a career-long LLL professional development.
- Regarding the content, the priorities are in-depth subject knowledge, pedagogical content knowledge, management of diversity in schools and building the capacities for teaching competences and especially the transversal ones. As regards ICTs training a specific programme has been scheduled for training of trainer in Universities in order to train teachers in the different disciplines.
- New methodologies for professional development favouring active, participatory and team-working models. The target of these methodologies is capacity building, reflection on previous teaching experiences and contextualized learning.
- Networking competences as well as competences for the design of learning settings and localized materials is also a new area in professional development.

Schools/teachers
- Schools -under the new policies agenda- are considered to become "learning communities" taking greater responsibility in promoting learning. For schools to be more autonomous and open learning environments, teachers should be supported to resume more responsibilities in identifying needs and redesigning local curricula and educational material. In this context
- LLL Professional development is a basis for schools upgrading. In this context the identification of a profile of competences of teachers under continuous improvement as well as tools for the identification of changing teachers needs is a valuable process.
- Teachers as change agents, which necessities a policy for Leadership in areas like curriculum educational material designers, promoters of learning partnership, evaluators of pupils' improvement, experts in action research and training experts. Accreditation of these experiences accumulated through practice such as laboratory and ICTs activities in Physics education.
- Cooperative learning networks between schools, Universities, Research Institutes, local communities and workplaces

References

Allal L. (2002), The Assessment of Learning Dispositions in the Classroom, Assessment in Education, Vol. 9, No 1, 55-58.
AAAS (American Association for the Advancement of Science), (1989), Science for All Americans, New York: Oxford University Press

Carr, M.-Claxton, G.L. (2002), Tracking the Development of Learning Dispositions, Assessment in Education, 9 (1), pp. 32-44
CTCF, Hellenic Single Framework for Curricula (online). Available: http://www.pi-schools.gr/download/programs/depps/english/3rd_b.pdf (Translated from the Official Gazette issue B, nr 303/13-03-03 and issue B, nr 304/13-03-03 by members of the P.I. main staff and teachers seconded to the P.I).

Δούκας Χ. (2005), Εκπαίδευση στις Φυσικές Επιστήμες στις Κοινωνίες της Μάθησης: Η προσέγγιση των Σχεδιασμών Διδασκαλίας, Ελληνικά Γράμματα.
Doukas C. (2007), Connecting Formal and Informal Learning in Science, International Journal of Learning, Vol. 13, N 10.
ESPA (2008), National Strategic Reference Framework, 207-201, Education and Life-Long Learning, Hellenic Ministry of Education

EU (2002), Working Group on key-competences, in Education and Training 2010 (online). Available: http://ec.europa.eu/education/policies/2010/objectives_en.html (04-12-2007, latest update)

EU (2006), Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning, Official Journal of the European Union, 2006/0962/EC, 30-12-2006

Eurydice (2002), key competences. A Developing concept in general Compulsory education (Survey 5) (online). Available http://www.eurydice.org

Hautamaki J., et.al. (2002), Assessing Learning-to-Learn, A Framework, National Board of Education, Helsinki University Printing House

ISC, Hellenic Analytical Framework for Curricula in Physics-chemistry (online). Available(http://www.pischools.gr/download/programs/depps/21depps%20Fisikon%20Epistimon.pdf) (in greek language).

Kalantzis M.-Cope B. (eds.) (2000), Multiliteracies, Routledge, London and New York
Lemke, J. (1998), Teaching All the Languages of Science Worlds, symbols, images and actions. (online) Available: http://academic.brooklyn.cuny.edu/education/jlemke/papers/barcelona.html

Klopfer, L. (1976), A Structure for the Affective Domain in Relation to Science Education, Science Education, 60

Lemke, J. (1998), Teaching All the Languages of Science Worlds, symbols, images and actions. http://academic.brooklyn.cuny.edu/education/jlemke/papers/barcelona.html

NRC (National Research Council), (1996), National Science Education Standards, Washington, National Academy Press.

OECD (DESECO) (2005), The Definition and Selection of key competences (DESECO), Executive Summary (online). Available: http://oecd.org/edu/statistics/deseco (27 May, 2005)

Osborne, J.-Simon S.-Collins S., (2003), Attitudes towards Science: A Review of the Literature and its Applications, International Journal of Science Education, 25(9)

PI, (Pedagogical Institute), (2006), Evaluation of quality and quantity characteristics of the Hellenic System of Primary and Secondary Education, Publication of Pedagogical Institution, PI.

PI (2008), Evaluation of the new educational material in Compulsory education, (research under evolution), PI

Perkins, D. N., Jay, E. Tishman, S. (1993), Beyond abilities: a dispositional theory of thinking. Merril-Parker Quarterly, 39 (1), 1-21.

PISA (2006), Assessing Scientific, Reading and Mathematical Literacies, A Framework for PISA 2006, (online). Available: www.oecd.org, (OECD 2006)

Rychen D. S., Salganik L.H. (Eds) (2001), Defining and Selecting key competences, Seattle, Toronto, Bern, Gottingen: Hogrefe and Huber Publishers

TIMSS (Trends in International Mathematics and Science Study (2003), Assessment Framework and Specifications 2003,http://timss.bc.edu/

Watts, D. M. & Alsop, S. J. (1997), A feeling for learning: modeling affective learning in school science, .The Curriculum Journal, 8,351-365.

Key competences: the foundation stone for vocational training

Key competences in Vocational Education & Training
The Dutch Case

— *Gert van den Brink*

Introduction

In the Netherlands, a new nationwide, competency-based Qualification Structure for vocational education and training (intermediate level) has been established in February 2008. This structure comprises 237 so-called Qualification Profiles, specifying the qualification requirements for a starting professional. Each Qualification Profile covers a professional domain (e.g. a profile for the professional group Hospitality/Bakery Entrepreneur). Implementation by the schools ("ROC's") is mandatory as from 2010. The schools are responsible for translating the Qualification Profiles into their own programmes, according to their own (didactic) views on competency-based education and to specific, regional workforce-conditions.
From 2009 onwards, approximately one fifth of the Profiles will be revised yearly.

In this contribution, *the format* that underlies each Qualification Profile is described and illustrated. Part of this format is a general Competency Model of the Dutch Centres of Expertise on Vocational Education, Training and the Labour Market (*powered by SHL*)[1]. This model consists of 25 competencies. It has been derived from the international SHL Universal Competency Framework (UCF) that includes 20 competencies (see: www.shl.com).

Examples of competencies from the 'Dutch' framework are 'presenting and communicating information', 'persuading and influencing', 'showing the need for achievement', 'acting businesslike', 'applying technology', 'adapting and responding to change', and 'following instructions and procedures'. In the Qualification Profiles these competencies are linked to specific *professional* key Tasks and Task-related, specific work processes. Matrices clarify the qualification requirements: every Key Task has one overall 'process & competency matrix'; the subordinated work processes have been specified separately, showing e.g. performance indicators and conditional knowledge and skills.

Some of the features of *working with* this Dutch Competency Model will also be highlighted.

A brief comparison with the eight "key competences for lifelong learning" recommended by the European Parliament and the Council of the European Union (Brussels, December 18 2006), will finalise this contribution to the Cidree Yearbook.

[1] This competency model will be referred to as the 'Dutch Competency Model KBB'; the addition (powered by SHL) is always implied.

The format of the Dutch Qualification Profiles (Q-profiles)

The format

For all qualification profiles, one format has been established to promote comparability and transparency. COLO - the Dutch Association of national Centres of Expertise on Vocational Education, Training and the Labour Market - stresses this is unique in the world.

The format comprises (i) four complementary parts and (ii) the Dutch Competency Model containing particularly 25 competencies with 126 components.

The four parts are:

a. a description of the profession. This part is meant for everyone who is interested in knowing: e.g. employers, teachers, employees, parents, students. It contains sections as 'Where can you work as a ...', 'what kind of work do you do as a ...', and 'what are you good at as a ...?';
b. the qualification profile, showing the qualification requirements (diploma demands). This part comprises among other things a list of qualifications within the professional group this qualification profile is meant for, a description of the professional group, trends and innovations, and an overview (matrix) of links between key tasks & work processes on one hand and the distinguished qualifications on the other hand. For each qualification and key task a description is given. Additional matrices show the competencies (from 'the' list of 25, see par. 1.2) required to carry out the work processes involved in a key task;
c. a more detailed description of the qualifications, especially meant for developers of educational programmes (curricula) and developers of exams & school-based assessments. For each work process, a matrix shows the relevant competencies with the (subordinated) components, the performance indicators and the professional knowledge and skills. In fact, the 'unpacking of the competences' is done in the matrices of part c;
d. an explanation and justification of the choices made.

Each Centre of Expertise on Vocational Education, Training and the Labour Market (18 in total) has applied this format. All 237 Qualification Profiles are illustrations of this format.

The Dutch Competency Model KBB: a summary

This Competency Model comprises particularly:
- 8 factors (see par. 1.3, 1st column) that underpin
- 25 competencies, and
- 126 subordinated components (the behavioural level); these components constitute the very core of the model.

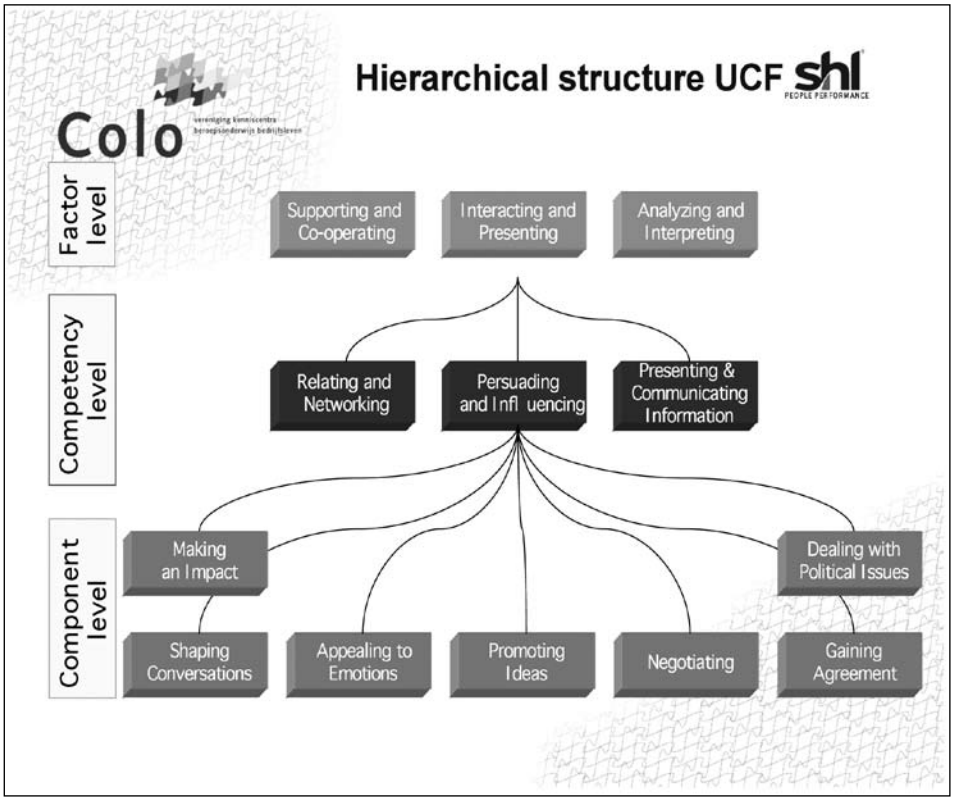
We here show the full set of 25 competencies (based on the SHL Universal Competency Framework):

- *Deciding and initiating action*
- *Leading*
- *Coaching*
- *Caring and understanding*
- *Cooperating and consulting*
- *Adhering to principles and values*
- *Relating and networking*
- *Persuading and influencing*
- *Presenting and communicating information*
- *Writing and reporting*
- *Applying expertise*
- *Applying technology*
- *Analysing*
- *Investigating and exploring*
- *Creating and innovating*
- *Learning*
- *Planning and organising*
- *Meeting customer expectations*
- *Delivering results*
- *Following instructions and procedures*
- *Adapting and responding to change*
- *Coping with pressures and setbacks*
- *Showing the need for achievement*
- *Entrepreneurialand commercial thinking*
- *Acting businesslike*

Examples of specifications of competencies (= 'components') are:

competences	**Components (behavioural level)**
persuading and influencing	making an impact shaping conversations appealing to emotions promoting ideas negotiating gaining agreement dealing with political issues
analysing	analysing and evaluating information testing assumptions and investigating producing solutions making judgements demonstrating systems thinking
adapting and responding to change	adapting accepting new ideas adapting interpersonal style showing cross-cultural awareness dealing with ambiguity

The hierarchical structure of the SHL Universal Competency Framework is illustrated below:



A comparison of the Dutch Competency Model KBB and the Universal Competency Framework (UCF) of SHL

The original framework 'SHL-UCF', from which the Dutch model has been derived, comprises:

- 20 competencies/dimensions, and
- 112 subordinated components.

Below you find a comparison. Some of the SHL-UCF competencies have been split up, e.g. 'Working with people' is subdivided into 'Caring and understanding' and 'Cooperating and consulting'.
The full set of subordinated components of both models can be obtained from SHL Nederland B.V. / SHL Europe B.V. (www.shl.com).

MATCHING SHL-UCF & the DUTCH COMPETENCYMODEL KBB *powered by SHL*

Factor (n=8)	Dimensions SHL-UCF (n=20)		competences KBB (n=25)
1. Leading and Deciding	1.1 Deciding and initiating Action	→	A. Deciding and initiating Action
	1.2 Leading and Supervising	→	B. Leading
		→	C. Coaching
2. Supporting and Co-operating	2.1 Working with People	→	D. Caring and Understanding
		→	E. Cooperating and Consulting
	2.2 Adhering to Principles and Values	→	F. Adhering to Principles and Values
3. Interacting and Presenting	3.1 Relating and Networking	→	G. Relating and Networking
	3.2 Persuading and Influencing	→	H. Persuading and Influencing
	3.3 Presenting and communicating Information	→	I. Presenting and communicating Information
4. Analysing and Interpreting	4.1 Writing and Reporting	→	J. Writing and Reporting
	4.2 Applying Expertise and Technology	→	K. Applying Expertise
		→	L. Applying Technology
	4.3 Analysing	→	M. Analysing
5. Creating and Conceptualising	5.1 Learning and Researching	→	N. Investigating and Exploring
	5.2 Creating and Innovating	→	O. Creating and Innovating
	5.3 Formulating Strategies and Concepts	→	P. Learning

6. Organising and Executing	6.1 Planning and Organising	→	Q. Planning and Organising
	6.2 Delivering Results and Meeting Customer Expectations	→	R. Meeting Customer Expectations S. Delivering Results
	6.3 Following Instructions and Procedures	→	T. Following Instructions and Procedures
7. Adapting and Coping	7.1 Adapting and Responding to Change	→	U. Adapting and Responding to Change
	7.2 Coping with Pressures and Setbacks	→	V. Coping with Pressures and Setbacks
8. Enterprising and Performing	8.1 Achieving Personal Work Goals and Objectives	→	W. Showing the need for Achievement
	8.2 Entrepreneurial and Commercial Thinking	→	X. Entrepreneurial and Commercial Thinking Y. Acting Businesslike

Illustrations of Format-use

To illustrate a Qualification-Profile (Q-Profile) and some crucial format-features we present below some Q-information / Q-matrices pertaining to the professional group "Hospitality/Bakery Entrepreneur" (version 2007-2008, COLO/Kenwerk, Zoetermeer).

This Q-Profile has four Key Tasks:

a. engaging in enterprise;
b. managing the business;
c. working in the bakery, and
d. working in hospitality.

Each Key Task comprises a number of work processes (n ranging from 5 to 15).

A part of the Process & Competency matrix for Key Task 4 is shown below; work processes are linked to a choice of competencies:

Process & competency matrix for Key Task 4 'Working in Hospitality'

Key Task 4 Working in Hospitality		*Work processes*	4.1 Carries out preparatory hospitality tasks	4.2 Informs/advises the guest and takes the order	4.3 Prepares drinks for serving	4.4 Prepares for the production of fast food products	4.5 Prepares products and dishes	4.6 Serves the order	4.7 Presents and settles the bill for the order	4.8 Creates and manages the atmosphere
Competences	A	Making decisions and initiating activities								
	B	Directing								X
	C	Supervising								
	D	Being attentive, showing interest and understanding								
	E	Collaborating and conferring	X			X		X		X
	F	Acting ethically and with integrity								X
	G	Building relationships and networking								
	H	Convincing and influencing		X						
	I	Presenting		X						X
	J	Formulating and reporting								
	K	Using professional expertise	X	X	X	X	X	X	X	
	L	Using materials, resources and equipment	X		X		X	X		
	M	Analysing								
	N	Conducting research								
	O	Creating and innovating								
	P	Learning								
	Q	Planning and organising								
	R	Focusing on 'customer' needs and expectations		X					X	X
	S	Delivering quality			X	X	X	X		
	T	Following instructions and procedures	X	X	X	X	X	X	X	X
	U	Dealing with change and adapting								
	V	Dealing with pressure and setbacks								X
	W	Showing enthusiasm and ambition								
	X	Showing enterprise and acting commercially								
	Y	Financial acumen								

Every work process within a Key Task is further elaborated in the 3rd part of a Q-profile. An example:

Key Task 1: Engaging in Enterprise			
1.1 Work process: Develops a business plan			
Description:	The Bakery Entrepreneur decides how to develop the business in the short term and in the long term. He defines the business objectives and the core activities of the business and specifies the way in which the objectives are to be achieved. The Hospitality/Bakery Entrepreneur decides on a business formula. In drawing up his business plan, he is guided by the market and the legal and social frameworks. He continually takes trends and developments into account and adjusts the business plan in light of these developments if necessary		
Desired result:	A business plan that anticipates and responds to trends and developments so the company can strengthen and expand its commercial position. The business plan contains the information needed to start a new business or to direct and manage an existing business		
Competency	Component(s)	Performance Indicators	Professional knowledge and skills
A Making decisions and initiating activities	- Decision-making - Considered risk-taking	Makes a clear decision regarding the business formula and the objectives and policy of the bakery and takes carefully considered risks in responding to the opportunities and threats for the bakery in order to be able to draw up a business plan	Knowledge of: - how to draw up business plans - the market - legislation and regulations - methods of analysis and (modern) means of communication - trends and developments Skills: - writing skills: Dutch - skills required to develop commercial policy
J Formulating and reporting	- Production of accurate and complete reports - Use of structure - Fluency and consciousness	Writes a complete, accurate, logically structured and very readable business plan, on which decisions regarding the starting and direction of a bakery can be based	
M Analysing	- Generating information from data - Drawing conclusions - Identifying connections	Analyses relevant information regarding the market, finance, legislation and regulations, the growth strategy and the positioning of the bakery within the market and determines the consequences of this information for the business formula and the objectives and policy of the bakery, in order to be able to make well-founded decisions regarding the business	
O Creating and innovating	- Demonstration of a vision for the future - Development of future-oriented strategies	Draws up a business formula and objectives based on future possibilities for the bakery and determines policy in light of the business formula, objectives, trends and developments, so the business anticipates future developments	
X Showing enterprise and acting commercially	- Knowledge of the market and the players - Identifying and creating opportunities and possibilities - Exploiting opportunities and possibilities - Strengthening and expanding the company's commercial position	Monitors developments in the bakery industry, identifies opportunities and threats for the business, translates opportunities into objectives and policy, and anticipates possible threats, in order to strengthen and expand the commercial position of the bakery	

Working with the Dutch Competency Model KBB and the Q-Profiles[2]

Below we summarise some experiences with the implementation of the new Dutch qualification structure:

- schools appreciate the increase in comparability and transparency within the whole Qualification Structure
- especially the 3rd part (see 1.1.c) is considered helpful with its high rate of concreteness, though the current mandatory status is occasionally doubted
- schools experience problems with (i) the assessment: how can progress in competency-acquisition by students be assessed? The formulation of performance indicators is often considered (too) complex, and (ii) the position of knowledge & skills: schools fear for under-estimation of knowledge & professional skills in promoting competency-based education
- in order to support schools in translating the new Qualification Profiles into educational programmes, the web based tool CurriculumPlanner® has been developed by the Dutch national institute SLO (NB: many Q-files have more than 200 pages!). Summer 2008 this tool will be linked to the central D-base with Q-Profiles (XML-files have been made available by COLO in May 2008). Users of CurriculumPlanner® can insert the needed Qualification Profiles into their school-specific curriculum structure; local curriculum-policy can be determined, and developers/teachers can insert and develop assignments within the predetermined local curriculum-policy. Moreover, managers can monitor the whole process and check coverage of the Qualification Profiles.

NB: in addition to the profession-related Q-Profiles, schools also have to take account of qualification requirements pertaining to 'Learning, Career and Citizenship' (LCC) and Dutch. Q-Profiles and LCC-requirements (including Dutch) constitute the 'full' set of diploma demands. In the foreseeable future requirements for arithmetic's/mathematics and modern foreign languages will be added. It is up to the schools to decide whether the teaching of LCC and the related assessment is intertwined with specific professional contexts. In Chapter 4 and 5 attention will be payed to the Dutch LLC-requirements.

Key competences for Lifelong Learning: the European 'Reference Framework' (ERF) and the Dutch requirements for 'Learning, Career and Citizenship'

In 2006, the European Parliament and the Council of Europe published a recommendation on key competences for lifelong learning. To compare this recommendation with the current Dutch competency framework for vocational education & training, (only) the labels of the European key competences will be given. The full description can be found in the contribution of Mr. Tapio Säävälä (see ...).

[2] in October 2007, the Secretary of Education announced the development of so-called Exam-Profiles by 'the' Centres of Expertise. The meaning of these profiles for the implementation of the Dutch Competency Model and the Qualification Profiles is not tackled is this contribution to the CIDREE Yearbook.

Prior to listing the key competences the 'Recommendation' (2006, p. 13) gives the main aims of the European Reference Framework (ERF):

1. "to identify and define the key competences necessary for personal fulfilment, active citizenship, social cohesion and employability in a knowledge society;
2. to support Member States' work in ensuring that by the end of initial education and training young people have developed the key competences to a level that equips them for adult life and which forms a basis for further learning and working life, and that adults are able to develop and update their key competences throughout their lives;
3. to provide a European level reference tool for policy makers, education providers, employers, and learners themselves to facilitate national and European level efforts towards commonly agreed objectives;
4. to provide a framework for further action at Community level both within the Education and Training 2010 work programme and within the Community Education and Training Programmes."

In the ERF 'Competences' and 'key competences' are clearly distinguished:

- a competence is defined as a combination of knowledge, skills and attitudes appropriate to the context. So this concept of a competence deviates from the SHL-definition[3]: the latter is context free;
- key competences however are "those, which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment".

The Reference Framework comprises the following eight key competences (KCs):

1. Communication in the mother tongue
2. Communication in foreign languages
3. Mathematical competence and basic competences in science and technology
4. Digital competence
5. Learning to learn
6. Social and civic competences
7. Sense of initiative and entrepreneurship, and
8. Cultural awareness and expression.

These key competences "are all considered equally important, because each of them can contribute to a successful life in a knowledge society. Many of the competences overlap and interlock: aspects essential to one domain will support competence in another. Competence in the fundamental basic skills of language, literacy, numeracy and in information and communication technologies (ICT) is an essential foundation for learning, and learning to learn supports all learning activities." (Recommendation, 2006, p. 13-14) Moreover, many competence-related notions are relevant for all key competences, e.g.: critical thinking, creativity, initiative, problem solving, risk assessment, decision taking, and constructive management of feelings.

[3] SHL uses the term 'competency' in stead of 'competence'.

In fact many European key competences show similarities with the Key Tasks mentioned in the Dutch document 'Learning, Career and Citizenship' (LCC). To unveil some similarities, we will list these Key Tasks and the subordinated work processes. Key Tasks 1 & 2 concern lifelong learning, learning to learn and the ambition to invest in personal development. Key Tasks 3 to 7 focus on citizenship[4]:

The Dutch LCC-Key Tasks:

1. **Denominates his personal development and uses means/methods to achieve relevant learning objectives** (KC **5**)
   - denominates learning objectives for the own development
   - collects appropriate ways of learning
   - chooses ways of learning with a high rate of relevancy (personal & situational)
   - plans his own learning process and implements it
   - evaluates the chosen way of learning
2. **Guides the personal career** (KC **5**)
   - reflects on own qualities and motives
   - examines opportunities in the workforce with personal relevancy
   - guides the own career and behaves in a pro-active manner
3. **Participates in the political domain, in decision-taking and policy-influencing** (KC **1**, **6**, **7**)
   - gains information about themes that are subject to political decision-taking
   - develops his own opinion
   - undertakes actions
4. **Functions as an employee in an professional organisation** (KC **1**, **2**, **3**, **4**, **6**, **7**)
   - behaves as an employee in performing professional tasks
   - uses employee's rights
   - behaves comradely
5. **Functions as a critical consumer** (KC **1**, **4**, **6**, **7**)
   - orientates oneself on the consumer market and takes own wishes and possibilities into account
   - undertakes actions to purchase products and services
6. **Participates in social contexts and behaves respectfully in the public domain** (KC **1**, **2**, **6**, **7**, **8**)
   - participates in a variety of social contexts and lives in the public domain
   - performs activities for the livability of his social environment
7. **Cares for his own health** (KC **1**, **4**, **5**, **7**)
   - looks for information about a healthy life-style
   - decides while taking relevant information into account and is led by this information.

For each of the seven Key Tasks, 'process & competency matrices' are given comparable to the example given in chapter 2 of this contribution (see the 2nd part of a Q-profile).

[4] Between brackets you will find a code referring to the related European Key Competence (KC)

A brief comparison of the Dutch Competency Model KBB and the European key competences for lifelong learning

Whereas the European framework lists 8 *key* competences that *all individuals* need, the Dutch model allows for profession-relevant *selections*[5] out of an overall-list of 25 competencies; these selections are embedded in nation-wide qualification requirements, agreed upon by the labour market and vocational education & training.
In the European framework (the notion of) each key competence is extended with 'essential skills and attitudes'. In the Dutch Model, however each specification of knowledge and skills is the result of a match between a competency and a profession-specific work process.

The Dutch Competency Model KBB:
- is derived from the SHL Universal Competency Framework (UCF) comprising 20 competencies; this UCF "encompasses all current thinking, around the world and in all job types, about what makes people perform at work. In addition, it provides a practical structure within which you can sort and prioritise competencies for a particular role or candidate. The framework is rooted in the science of psychometrics ..."
- is a subject- and profession-neutral framework
- comprises 8 factors that are basic to 25 competencies
- each competency is specified in components
- in total 126 components are distinguished; these components constitute the very core of the Dutch Competency Model KBB

Examples of components:

The competency 'presenting and communicating information' comprises six components:
- speaking fluently
- explaining concepts and opinions
- articulating key points of an argument
- presenting and public speaking
- projecting credibility
- responding to an audience.

The competency 'writing and reporting' encompasses four components:
- writing correctly
- writing clearly and fluently
- writing in an expressive and engaging style
- targeting communication.

- the relevancy of the 25 competencies depends on (profession-specific) key tasks en task-related work processes
- mandatory Qualification Profiles for Vocational Education and Training highlight a *selection* of competencies within 'process & competency matrices'.

[5] In the Dutch document 'Learning, Career and Citizenship' the same principle has been applied.

The European key competences:
- constitute a 'reference framework' that embodies a mixture of general and subject-related[6] competences
- the framework comprises eight key competences that *all* individuals need, irrespective of academic or professional preference
- each key competence is clarified by 1. a definition and 2. a text summarising essential knowledge, skills and attitudes related to the key competence

An example of a definition:

The key competence 'communicating in the mother tongue':
Communication in the mother tongue is the ability to express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing), and to interact linguistically in an appropriate and creative way in a full range of societal and cultural contexts; in education and training, work, home and leisure.

Future oriented proposals

In comparison to the European Framework, the Dutch Competency Model KBB allows for more specific, profession-related clarification of competency-based education.
Countries that are preparing a shift in their qualification structure for vocational education and training, could organise pilots using (a version of) the Dutch Competency Model KBB. In addition, an (adapted) use of the web-based tool CurriculumPlanner® - that has a multi-language function - could be considered; each term in CurriculumPlanner® can be easily replaced by a linguistic equivalent.

[6] e.g. communication in foreign languages, mathematical competence and basic competences in science and technology

References

Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC), in: Official Journal of the European Union , 30-12-2006, p. 394-10 to p. 394-18

Prepared for the Future. (March 2008), Dutch qualifications for the labour market. COLO, Zoetermeer

Dutch national secondary vocational education qualifications; Professional Group: Hospitality/Bakery Entrepreneur, Version 2007-2008, COLO/Kenwerk, Zoetermeer

SHL Universal Competency Framework, setting a new standard, talking a new language. (2005), SHL Group, (a leaflet)

www.kwalificatiesmbo.nl: the full collection of 237 Dutch Qualification Profiles, with a search engine

www.colo.nl: the Dutch Association of 18 National Centres of Expertise on Vocational Education, Training and the Labour Market

www.kenwerk.nl: the Dutch Centre of Expertise on Vocational Education, Training and the Labour Market for hospitality, bakery, tourism, recreation and facility services

www.shl.com: the gateway to the SHL Universal Competency Framework

www.opleidingplanner.nl: information about the web based tool CurriculumPlanner® that facilitates VET schools in translating the 237 Dutch mandatory Qualification Profiles into competency-based educational programmes

About the Authors

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Anna Valouchová graduated in 2006 for English and Norwegian at Charles University in Prague; she spent a year (2003-2004) at the Department of Interdisciplinary Studies of Culture at University in Trondheim, Norway and worked in a company producing educational online programs (CFME). She lobbied for an NGO (Gender Studies). Since 2008, she has been working for the Research Institute of Education in Prague where she specializes in key competences and Comparative Education.

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