An overarching conceptual framework for assessing key competences in an international context

Lessons from an interdisciplinary and policy-oriented approach

Dominique Simone Rychen

In:

Additional information on Cedefop's research reports can be found on:
http://www.trainingvillage.gr/etv/Projects_Networks/ResearchLab/

For your information:

- the **background report** to the third report on vocational training research in Europe contains original contributions from researchers. They are regrouped in three volumes published separately in English only. A list of contents is on the next page.

- A **synthesis report** based on these contributions and with additional research findings is being published in English, French and German.

  Bibliographical reference of the English version:
  Descy, P.; Tessaring, M. *Evaluation and impact of education and training: the value of learning*. Third report on vocational training research in Europe: synthesis report. Luxembourg: Office for Official Publications of the European Communities (Cedefop Reference series)

- In addition, an **executive summary** in all EU languages will be available.

The background and synthesis reports will be available from national EU sales offices or from Cedefop.

An overarching conceptual framework for assessing key competences in an international context

Lessons from an interdisciplinary and policy-oriented approach

Dominique Simone Rychen

Abstract

The OECD project DeSeCo (Definition and selection of competences: theoretical and conceptual foundations) was undertaken in response to this increasing interest in education outcomes and their effects. DeSeCo developed a common, overarching conceptual frame of reference for identifying and assessing key competences. Key competences are individually based competences considered necessary or desirable for effective participation in democratic societies and for coping with global demands, particularly those related to the so-called knowledge economy or information society.

DeSeCo was initiated in the OECD context at the end of 1997 and carried out under the leadership of the Swiss Federal Statistical Office. It is embedded in OECD's long-term programme on education indicators (INES) which aims to provide measures on the functioning, development and impact of education. The work of DeSeCo was designed to complement past and current international empirical studies, in particular the International Adult Literacy Survey (IALS), the Programme for International Student Assessment (PISA) and the Adult Literacy and Life Skills (ALL) survey. The analysis and reflection in DeSeCo is not restricted to what can be learned and taught in schools or to what is currently or readily measurable in large-scale assessments. DeSeCo has not addressed its task by an inductive method, starting from factual situations, but rather by starting at a more general level, laying out conceptual and theoretical considerations.

DeSeCo's approach is international, interdisciplinary and policy-oriented. Inputs to DeSeCo have included discipline-oriented academic contributions, commentaries from leading experts working in various fields, as well as country-specific reports. Two international symposia and various expert meetings provided opportunities for gaining interdisciplinary insight and a better understanding of the needs and concerns of policy-makers and experts from education, business, labour, health and other relevant sectors. These varied inputs have led to the construction of an overarching conceptual frame of reference for assessing and developing key competencies.

Table of contents

1. Introduction

The DeSeCo project (Definition and selection of competences: theoretical and conceptual foundations) is a response to several trends that arose independently in different sectors that are now beginning to converge, with major policy implications. One trend is a concern for people's abilities to cope with the many rapid changes that are taking place in the world, including the emergence of the so-called knowledge economy and information society. Although there is little consensus on specific competences and skills that individuals will need, there is considerably more consensus on more general requirements, such as creativity, initiative taking and adaptability. Another trend is the shift from input- to outcome-based public policies, particularly in education and training and the resulting demand for relevant statistical data and indicators. Simultaneously, large-scale educational assessments are expanding from measuring academic achievement alone to considering individuals' ability to apply knowledge and skills in non-school contexts. This expansion brings with it a number of new terms and concepts, but little consistency in their usage.

In light of these trends, an attempt to relate the demands of the modern world to abilities, skills and other qualities individuals need in order to provide useful information for policy and planning is both appealing and logical. In the context of the OECD, the natural starting point was its system of education-related indicators. Although these indicators have undergone significant development and have always been policy-relevant, a broader perspective on what should be assessed and an overarching theoretical framework for such assessments were deemed necessary to help guide future indicator development and long-term assessment strategies.

Throughout its brief history, DeSeCo has sought to include a broad range of perspectives not only from the academic world, but from the worlds of public policy, labour, education and business as well. Attention has also been given to the varying contexts found throughout the participating countries. Each input has contributed a unique combination of perspective, experience, expertise and interest that has helped shape the goals, definitions, limitations and potential of DeSeCo. By taking an approach that was both conceptual and pragmatic, it is hoped that DeSeCo will enhance the relevance of international assessments. Based on the outcomes of this study we are now prepared to establish and affirm several important guiding principles and discuss the implications of DeSeCo for further work.

2. Background information

2.1. Policy context

In light of common challenges and transformations taking place in economies and societies throughout the world, education is widely viewed as an important investment and asset for both the individual and the community. While economic growth remains a main objective for governments and societies, there are increasing policy concerns about its impact on the natural and social environments (for instance OECD, 2001a). Lifelong learning and competence or skill development have become key notions in international efforts to enhance economic and social development (for instance the World Bank, 2002; OECD, 2001b). With this heightened importance placed on education and lifelong learning, tomorrow's curriculum and educational goals have become a relevant topic in political discourses all over the world (within OECD see for instance Trier, 2003). There is a growing concern among governments, employers and the general public about the adequacy and quality of education and training. This concern is, for example, reflected in the European Commission communication, *Making a European area of lifelong learning a reality* (2001, p. 3): 'Traditional policies and institutions are increasingly ill-equipped to empower citizens for actively dealing with the consequences of globalisation, demographic change, digital technology and environmental damage. Yet people, their knowledge and competences are the key to Europe's future'.

With a shift from input- to outcome-oriented policies, the OECD and other international institutions have invested considerable effort in developing comparable outcome indicators in the education field to provide information relevant for government policy (Salganik et al., 1999; Salganik, 2001). In general, these indicators reflect traditional notions of academic achievement and skill development, such as reading and mathematics skills, either in curriculum-based or real-world-based contexts. This focus partially results from practical considerations, but also results from the fact that these skills are recognised as foundation skills, crucial to success in the so-called knowledge and information society of today. Though traditional competences such as reading literacy have been measured throughout OECD countries and beyond, there is a broad consensus that we are far from assessing a truly comprehensive set of competences relevant to human and social development and political and economic governance. OECD constituencies, recognising the need for a conceptual basis for defining and selecting relevant competences, thus welcomed the work programme of the DeSeCo project. DeSeCo's theory-based and policy-oriented work programme found broad support and interest within and outside of the OECD.

2.2. Research context and focus of the study

The DeSeCo project originated in a governmental context, the OECD, at the end of 1997 and was carried out under the leadership of the Swiss Federal Statistical Office. It is embedded in OECD's long-term programme on education indicators (INES), aimed at providing measures on the functioning, development and impact of education from early childhood, through formal education and to learning and training throughout life. The work of DeSeCo was designed to complement past and current international empirical studies, in particular the International Adult Literacy Survey (IALS), the Programme for International Student Assessment (PISA) and the Adult Literacy and Life Skills (ALL) survey. Throughout the work programme, close ties with these and other international surveys have been maintained in recognition that success in this complex field depends not only on theoretical and empirical work, but also on the iterative process entailed by constant dialogue and exchange among the various specialists and stakeholders.

The main goal of DeSeCo was the construction of an overarching conceptual frame of reference relevant both for the development of key competences in a lifelong learning perspective and for the assessment of these competences in an international setting. This study does not address the topic of education outcomes by proceeding with an inductive method, starting from factual situations, but rather by starting at a more general level, laying out conceptual and theoretical considerations. DeSeCo considers the topic of important, necessary or desirable competences from a broad, holistic and interdisciplinary perspective. Thus, the reflection on and analysis of key competences is not limited to the school context, student achievement or workers' skills and the demands of the labour market.

While recognising the value and importance of domain- or job-specific competences and technical skills, DeSeCo focuses on competences that apply across multiple areas of life (for instance, in the family, at work, in the political sphere, in the health sector, etc.) and that contribute to personal, economic and social well-being. The leading theme is: in light of the demands of democratic societies and the global challenges of modern life including those related to the knowledge-based economy or information society, what competences are important or necessary for everyone; and, what are the normative assumptions and conceptual criteria through which these competences are constructed?

Considerations of whether these competences can be assessed or measured in large-scale or qualitative studies – and if so, how – were not at the forefront. The determination of potentially 'new' competences is based, instead, on several issues that have not played prominent roles in the past, including:

(a) theoretical models and concepts – what is a competence? What makes a competence 'key'?

(b) cultural context, biographical variability – to what extent are the competences identified relevant across cultures and to individuals occupying different positions in society and the economy?

(c) political negotiation, consensus formation – which competences do policy-makers value and which do they have interest in assessing?

(d) visions of society and individuals – to what extent do the identified competences depend on a particular set of assumptions about the way the world should be and the way people should behave?

DeSeCo's approach of asking these types of questions, of stepping back from the immediate development of assessment instruments and of providing a platform for reflection and exchange among scholars, policy-makers and experts from various fields proved a useful model for furthering the conceptual and theoretical foundations of relevant competences.

3. Necessary steps in the definition and selection of key competences

The conclusions and recommendations drawn from this interdisciplinary and policy-driven research are the results of a collaborative effort among scholars from different disciplines; experts from education, business, labour, health and other relevant sectors; as well as various stakeholders at the national and international level.

The work programme consists of four main studies and two international symposia. Throughout the project, attention has been given to ensure inclusion of both theoretical considerations, as represented in many of the expert papers (Rychen and Salganik, 2001) and practical and policy-oriented needs, as described in the reports stemming from the country contribution process (Trier, 2003). Since these activities constitute the key sources and reference materials for the construction of an overarching frame of reference and for the conceptualisation of key competences, the following sections will highlight the rationale and main findings for each activity.

3.1. Analysis of international comparative studies on learning outcomes

To understand the state of the field, uncover any gaps in knowledge and work out the most promising strategy at the international level, DeSeCo began in 1998 with an analysis of three major studies on competences that had been conducted within the OECD context: the Cross-Curricular Competences Project, an explorative study; the International Adult Literacy Survey (IALS) and the Human Capital Indicators Project (Salganik et al., 1999). Several central themes were found to transcend these three studies, including: desired outcomes of education are broader than the acquisition of the subject-related knowledge typically taught in school; competences develop beyond the school context throughout life; and education is not an end in itself, but a means for making students competent and thereby prepared for life.

The authors also found that, despite common goals and a connection to the OECD, there were few explicit links between the three studies, in terms of both an overarching theory-grounded framework and a larger coordinated research effort. Since the studies arose from different purposes and focused on different types of population groups, this was neither surprising nor considered a shortcoming of their designs at that time. In all of these studies, pragmatic considerations dominated and, ultimately, priority was given to empirical testing of concepts by applying existing methodologies, instruments and, when possible, existing data. Due to the emphasis on the feasibility of measurement, theoretical and conceptual considerations such as an understanding of the nature of competences and the interrelations among various competences were not an issue. These findings confirmed the need to further advance the theoretical underpinning of competences, in particular by developing an explicit, overarching conceptual framework to guide future work.

More recent and partly still continuing projects, such as the PISA, the ALL survey and the IEA Civic Education Study (CivED), were further analysed in 2000. Two of the main findings of this review, specifically that there has been considerable investment in 'conceptual work and [the] development of measures grounded in well-established theory' (Salganik, 2001, p. 30) and that lessons learned from previous studies were more fully incorporated in the new studies, indicate potential interest in and application for DeSeCo's work.

3.2. Towards a clarification of the concept of competence

In light of the terminological and conceptual confusion associated with notions such as competence, skills, qualifications, standards, literacy and so on, an expert paper was commissioned to provide a preliminary clarification of the

concepts related to competence and key competence (Weinert, 2001). With its systematic analyses of existing terms and the theoretical and conceptual approaches within the social sciences to the concept of competence, the paper served a necessary and important function. In line with Weinert's recommendations as confirmed by subsequent discussions on conceptual issues, DeSeCo, as discussed below, opted for a functional (demand-oriented) approach to competences.

3.3. Expert opinions from multiple disciplines and sectors

In 1999, renowned scholars from different academic disciplines (anthropology, psychology, economics, sociology and philosophy) were asked to construct a set of relevant key competences from their own theoretical background and disciplinary perspective. The authors were expected to justify their selections theoretically, taking into account any available state-of-the-art research-based evidence.

The philosophers Canto-Sperber and Dupuy (2001) drew on their expertise in moral and social philosophy and the philosophy of mind not only to address the question of key competences but also to consider what constitutes 'the good life'. Haste (2001) emphasised from her sociopsychological viewpoint the need to look at individuals in a cultural, social and linguistic context. For Perrenoud (2001), a sociologist, the central question to be addressed was what competences are needed by everyone to freely exercise his or her autonomy in multiple social fields. He associated a successful life with not being abused, alienated, dominated or exploited. Levy and Murnane (2001), as well as Goody (2001), differed from the other authors in so far as they used an empirical approach to the issue of competence. Levy and Murnane used relevant economic theories and empirical results to address the question of the competences workers need to succeed in the labour market. Goody, the anthropologist, rejected engaging in a decontextualised discussion of key competences on the grounds that theory must always be considered in relation to practice.

Subsequently a commenting process was initiated (Rychen and Salganik, 2001), wherein the scholarly papers were distributed among the authors, other academics and leading representatives from various social sectors. It was a first step to explore main convergences and divergences among the different disciplinary perspectives and to gain insight on priority areas from practical and policy-oriented perspectives. The results of this commenting process constituted a starting point for further exploring common or complementary concepts and models relevant from an interdisciplinary and international perspective.

3.4. Country contribution process

Recognising that defining key competences is a process that draws not only on a scientific foundation but also on negotiations among various stakeholders in the political and economic arenas, a country consultation process was launched to gain insight on the public debate and the education needs and priorities of various national contexts and sectors both within and across countries. A summary report was prepared based on the national contributions submitted from 12 OECD countries (Trier, 2003). Convergence rather than divergence was found across countries and between the economic and education sectors within countries. Similar competence areas with almost identical content are emphasised, even if they are worded differently. Indeed, there is a broad consensus on the importance of social competences, communication, literacies, lifelong learning, personal competences and competences necessary for participation in political life. Value orientation is another aspect of particular concern in several countries.

3.5. Debates and exchange: from multiple perspectives towards interdisciplinary insight

Each of the four activities described above raised specific challenges that DeSeCo had to overcome and emphasised the need to bring together the knowledge and insights gained through these activities. Two international symposia and various expert meetings provided opportunities for moving

from the specific activities and multiple perspectives towards increased understanding and awareness of the issues at stake and eventually to a consensus on an integrated frame of reference.

The first international symposium in 1999 was a forum bringing together scholars and experts, including the authors of the papers (Rychen and Salganik, 2001). It succeeded in creating an international network of interested academics and experts, increasing the awareness of the issues inherent in dealing with questions of competences and their assessment and clarifying and prioritising avenues for further work in this area.

The second international symposium (Rychen et al., 2003), with approximately 170 participants, including policy-makers, policy analysts, assessment specialists, academics and representatives from national and international institutions, provided a forum for further consolidating concepts and ideas on key competences and working towards consensus around the question of what competences are relevant for today's societies and economies. It succeeded in outlining options and strategies for the eventual development of a coherent international assessment programme (OECD, 2002).

4. Elements of DeSeCo's overarching frame of reference for key competences

Given the initial finding of a lack of a common conceptual framework for understanding competences (Salganik et al., 1999; Weinert, 2001), the research conducted within the scope of DeSeCo resulted in a comprehensive frame of reference to situate current and future key competencies in a larger conceptual context. It includes, as core elements, the concepts of competence and key competence and a threefold categorisation for key competences considered as critical for a successful life and a well-functioning society.

4.1. Criteria for competences and key competences

4.1.1. The concept of competence

A competence is defined as the ability to meet a complex demand. Each competence corresponds to a combination of interrelated cognitive and practical skills, knowledge and personal qualities such as motivation, values and ethics, attitudes and emotions. These components are mobilised together for effective action in a particular context. This definition represents a demand-oriented or functional approach, placing at the forefront the manifold demands individuals encounter in the context of work and everyday life. It is holistic, in the sense that it integrates and relates demands, individual attributes and context as integral elements of competent performance.

To facilitate the further discussion of competence, it is important to emphasise that in the DeSeCo project, the terms 'competence' and 'skill' are not used as synonyms. The term 'competence' (a holistic concept) designates a complex action system encompassing knowledge, cognitive skills, attitudes and other non-cognitive components, while the term 'skill' is used to designate an ability to perform motor and/or cognitive acts.

4.1.2. The concept of key competence

Based on the concept of competence described above, one could imagine any number of competences. DeSeCo's policy orientation, however, requires further focus on key competences in the sense of 'competences of prime importance for a successful life and effective participation in different fields of life – including economic, political, social and family domains; public and private interpersonal relations; and individual personal development' (SFSO, 2001b). This approach is consistent with the general commitment of OECD countries to expand opportunities for individuals in various spheres of life, to improve overall living conditions in society and to invest in the development of competences for all (OECD, 2001b). Based upon a review of existing work in the area of competence and on the input of experts from a variety of backgrounds, two important criteria for key competences are put forth; namely, that key competences:

(a) contribute to broad desired outcomes of an overall successful life and a well-functioning society;

(b) enable all individuals to cope successfully with complex demands and challenges across a wide spectrum of relevant contexts and domains.

The first criterion raises the important questions 'What constitutes a successful life?' and, 'What are desirable goals for societies?'. Individual and societal ideals and goals are as varied as individuals and societies themselves. However, numerous international conventions and agreements, such as the Universal Declaration of Human Rights, the Rio Declaration on Environment and the World Declaration on Education for All, exhibit consensus around broad desirable goals for all individuals and countries that can serve as the basis for a common normative framework. For example, the World Declaration on Education for All (1990) described several goals of education that are relevant for all individuals in all societies: 'To survive, to develop their full capacities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions and to continue learning' (Article 1). Thus, basic principles of human rights, democratic values and

the broad goals of sustainable development provide a normative anchoring point for the discourse on key competences and their selection and development. While more specific normative frameworks could be developed for specific individuals and societies, this framework is considered applicable to all and is specific enough to ensure that key competences relate only to demands that are meaningful and desirable.

The second criterion narrows selection to only those competences that are transversal in the sense that they are necessary for understanding and acting effectively in and across different relevant domains or areas of life such as the workplace, personal life, the health field, the political domain, etc. Thus, competences that are domain-specific, that is, applicable in only one sector of the economy or society, are not deemed key competences. DeSeCo's focus on key competences does not question the relevance of such domain specific competences. These are necessary and often constitute important resources for coping with the demands of particular contexts and situations.

In addition, conceptualising key competences requires consideration of demands and challenges faced by individuals and societies. When speaking of the complexity and challenges of today's world, there is broad consensus that basic skills, although important, are not sufficient. Many scholars and experts agree that effective and responsible participation in today's world calls for the development of a higher mental level of complexity (Kegan, 2001) that implies critical thinking and a reflective, holistic approach to life on the part of the individual. This notion of reflectivity (though a variety of terms are used) is a common thread throughout the various contributions from scholars and experts prepared for DeSeCo (in particular, Kegan, 2001; Canto-Sperber and Dupuy, 2001; Perrenoud, 2001). This higher level of mental complexity (or, using other terms, a critical stance and a reflective/integrated/holistic approach to life) represents a central transversal feature of the identified key competences.

To summarise, key competences as adopted in the OECD are competences (each of which consists of a cluster of cognitive skills and non-cognitive dimensions such as attitudes, motivation, values and emotion, the structure of

which are defined by the demand in question) that help individuals cope with complex demands and thus require critical thinking skills and a reflective/holistic approach to life. Key competences apply to various relevant areas of life and, as such, can be considered transversal competences. They contribute to highly valued individual and societal outcomes (i.e. an overall successful life for individuals and a well-functioning society) consistent with the universal goals and values identified by international conventions.

4.2. Three categories of key competences

Based on the inputs and interdisciplinary perspectives received in the course of the DeSeCo project, we have constructed a threefold categorisation of key competences for interpreting and further conceptualising key competences. The three theory-grounded, broad categories are acting autonomously, using tools interactively and interacting in socially heterogeneous groups.

Within the three categories we have highlighted a number of key competences that are particularly relevant for coping with many of the complex demands individuals and societies face. The identified competences are the result of an analysis of the various lists of key competences presented in the country reports and the expert contributions in light of the established definitional, conceptual and normative criteria described above. In the terminology of human capital, they contribute to important outcomes such as economic resources/employment, political participation, economic growth, social cohesion and the realisation of human rights.

The three categories and the key competences identified within each category, briefly described below, are detailed in DeSeCo's final report (Rychen and Salganik, 2003).

4.2.1. Acting autonomously
To act autonomously incorporates two central interrelated ideas, the development of personal identity and the exercise of relative autonomy in the sense of deciding, choosing and acting in different social fields. Acting autonomously does not mean functioning in social isolation. Instead,

it implies that individuals are enabled to manage their lives in meaningful ways by exercising control over their living and working conditions and by playing an active part in shaping their own lives. It requires an orientation towards the future and an understanding of one's environment, its functioning and the roles one plays within that environment (Perrenoud, 2001). The following key competences are relevant when it comes to acting autonomously:

(a) the ability to defend and assert one's rights, interests, limits and needs;

(b) the ability to form and conduct life plans and personal projects;

(c) the ability to act within the big picture/the larger context (i.e. the larger historical, cultural or environmental context of actions and decisions and their long-term and indirect consequences).

4.2.2. Using tools interactively

The word 'tool' is used in the broadest sense of the term to include language, information and knowledge in addition to physical tools. To use a tool interactively assumes not only a familiarity with the tool itself but also an understanding of how the tool changes the way one can interact with the world. A tool is not just a passive mediator but is instrumental as part of an active dialogue between the individual and his or her environment (Haste, 2001). Underlying this is the idea that we encounter our world through our cognitive, social and physical tools. These encounters shape how we make sense of the world and become competent in interaction. The following key competences have been identified as relevant when it comes to using tools interactively:

(a) the ability to use language, symbols and text interactively;

(b) the ability to use knowledge and information interactively (to manage and use it as a basis for understanding options, forming opinions, making decisions and for taking informed actions);

(c) the ability to use (new) technology interactively (including the ability to see potential new uses of it).

4.2.3. Interacting in socially heterogeneous groups

In this category the focus is on the interaction with the 'other', the different other. Human beings are dependent on ties to others for material and psychological survival, for a sense of self, identity and social meaning (Ridgeway, 2001). Living and participating in multicultural societies and coping with increasing individual and social diversity require the ability to interact and coexist with people who do not necessarily speak the same language (literally or metaphorically) or share the same memory or history. By bridging these divides, these interpersonal or social competences help create social capital. The following key competences are relevant when it comes to interacting effectively with other people:

(a) the ability to relate well to others (involving, initiating and maintaining relationships with family members, friends, neighbour, boss, colleague, etc.);

(b) the ability to cooperate (to work together toward a common goal);

(c) the ability to manage and resolve conflict (in a constructive manner).

4.3. Interacting of key competences

The hypothesis is that for individuals to meet the complex demands of modern life in a successful way and to contribute to the quality of society, they need to mobilise these kinds of competences in particular contexts. The competences do not, however, operate independently of each other. They are interrelated. The resulting patterns of these interrelated competences can be conceived as constellations, whose forms or interplay – the particular relevance of each competence within this constellation – depend on the desired outcomes at the individual and societal level and the context in which they apply.

One way to illustrate the relative importance of key competences with regard to their contribution to desired outcomes in different contexts is by conceptualising a multi-dimensional space whose axis are defined by the key competences. The various contexts (a country or a social field) can then be located in the space depending on the relative importance of the key competences for meeting the demands or goals in question.

5. Implications for a coherent assessment strategy

Developing assessments and indicators for key competences is not in DeSeCo's scope of work, although such work is clearly implicated by the notions discussed above. At this point, with the establishment of a conceptual frame of reference for key competences, it is possible and appropriate to highlight some of those implications for the development of assessments and indicators. This section presents some issues that are relevant to the elaboration of a long-term data strategy for evaluating learning outcomes in the OECD.

5.1. Dealing with the complex nature of key competences

The three broad categories of key competences, acting autonomously, using tools interactively and interacting in socially heterogeneous groups, have been recognised in the OECD as a valuable conceptual tool for mapping and further conceptualising the competences for which statistical indicators are developed. DeSeCo's work also confirms the theoretical relevance of what has been measured or proposed to be measured in international comparative assessment projects such as IALS, PISA and ALL. With the exception of initial efforts related to acting autonomously (self-regulated learning in PISA) and interacting in socially heterogeneous groups (exploration of teamwork for ALL), these projects have focused on competences which are related to using tools interactively (mainly related to using language, symbols and texts). This is an area for which theory provides a strong basis for measurement. Future research efforts in the field of key competence should be directed to the development and validation of measures related to key competences identified in the other two categories, acting autonomously and interacting in socially heterogeneous groups. However, key competences in these areas are much more socially and culturally embedded, a fact that must be taken into account in the development of any measures

and particularly internationally comparable measures (Murray, 2003). Focusing on new competence domains does not, of course, preclude continued research and development of the competences included in the category using tools interactively. In particular, research is required with respect to representing the level of mental complexity that involves critical thinking and a reflective, holistic and integrated approach.

In all categories of key competences, developing appropriate and reliable measures and interpreting the significance of any results necessitates open and innovative approaches to assessment methodologies, for several reasons. One is that assessments ideally reflect the complex nature of a competence, a combination of different interrelated component elements, including knowledge, cognitive skills and social and behavioural components (e.g. motivation and ethical/moral attitudes). This requires either some method of assessing the competence itself, or assessing one or more of the component elements and developing a model to relate the results to statements about the level of competence development.

Second, because key competences are interrelated and operate as constellations that vary with cultural and contextual factors, assessing key competences in isolation will not do justice to the multi-dimensional reference points associated with key competences. A variety of methodologies and settings will need to be explored to more accurately capture the complex nature of a competence and effectively profile the constellations of key competences that contribute to highly valued outcomes.

Third, similar to the more recent conceptualisations of 'literacy' and unlike traditional notions of 'literate' and 'illiterate', assessing competence is not a matter of assessing whether an individual does or does not possess it, but rather of determining where along a continuum of competence an individual's performance falls. Such a continuum must include a comprehensive range of levels to reflect the implications of the necessary level of mental complexity, in which individ-

uals ground their decisions and actions in critical thinking and a reflective/integrative/holistic approach.

Hence, the findings from DeSeCo reinforce the importance of further developing complementary assessment methodologies to produce a system for providing policy-relevant information on key competences and to more accurately capture the expression of key competences. The complex nature of key competences – including such aspects as their demand orientation, interrelatedness and relation to broadly desired outcomes – requires data from multiple sources, including, but not limited to, the collection of large-scale assessment data through paper and pencil or computerised instruments. Interactive computer simulations hold particular promise, as they allow for broadening assessment tasks and creating dynamic assessment situations. Adaptive and interactive testing simulates a more authentic context, where an individual's actions may be judged not only in response to a single static prompt, but progressively, on multiple levels as a situation develops. In addition, performance assessments and portfolios provide other complementary approaches for reviewing individuals' development and progress in one or more areas over time. And, last but not least, video-based data collection, as pioneered in TIMSS could provide more in-depth and qualitative information and add to a more complete picture of competences within various populations.

It should be noted that assessments using these methods are not well established and are almost certainly more expensive than traditional assessments. This should not be viewed as an insurmountable barrier to developing indicators for key competences though, but rather as an indication of the challenges faced.

5.2. Towards a coherent assessment strategy

Good governance and effective policy-making rely on information, data and statistics that are based on sound foundations. The design of a coherent international assessment strategy for competences therefore needs to be guided by policy priorities and by an overarching conceptual frame of reference such as that provided by DeSeCo. With specific regard to key competences, policy-makers need to reach consensus on the value of choosing to measure some key competences or components of competences over others (considering factors such as the extent to which they are amenable to policy intervention). At the same time, researchers need to provide further conceptual input during that selection process and effective guidance on the feasibility of developing valid and reliable measures of new theory-grounded constructs. A future coherent assessment programme should take advantage of the conceptual and empirical frameworks that currently support internationally valid, reliable and comparable assessments of competences, building on the empirical experiences of current large-scale studies, in particular PISA and ALL.

A forward-looking assessment strategy should include plans and methods not only for providing data on the level and distribution of key competences over time and in different contexts, but also for using that information to learn more about the interrelatedness of key competences and their influence on desired outcomes. Containing this type of information, competence-related assessments could thus be used to answer such questions as, 'Do certain sub-populations show higher levels of development in certain key categories?' 'How has the distribution of key competences changed over time and what are possible explanations for these changes?' 'Are there correlations between levels of development of certain key competences?' and 'Do key competences in fact appear to lead to desired societal outcomes?'. Answering such questions would require a mechanism for collecting data on social contexts, a longitudinal approach, assessment of people from different backgrounds and at different stages in life and a cyclical structure of assessments. A coherent assessment programme, in turn, calls for coordinated planning and implementation at the international level and sustained political and financial support over many years.

6. Conclusions

The OECD project DeSeCo concluded with its final report entitled *Key competencies for a successful life and a well-functioning society* (Rychen and Salganik, 2003).

Through its collaborative process, DeSeCo succeeded in its missions: to propose a framework for understanding key competences based both on current theory from a variety of academic disciplines and on practical considerations. This overarching frame of reference serves several purposes: it presents a basis for a common, coherent and international discourse on competence development in a lifelong learning perspective; it has the potential to focus and improve future initiatives related to key competences, most significantly the development of a comprehensive strategy for data collection and analysis, including a determination of which competences to assess, both in the mid and long term; and to guide the development of assessment instruments and policy-relevant indicators.

Any such strategy must be linked to work already underway regarding domain-specific assessments. DeSeCo can help situate these assessments – and other empirical findings on the outcomes of learning and teaching – in a broader conceptual context and clarify what is actually being measured and what is not.

Beyond assessments and indicators, the results of DeSeCo can provide valuable input to the prioritisation of particular competences for education curricula and training programmes development and for discussions of policies and programmes aimed at enhancing key competences among specific or general populations.

Although DeSeCo has provided some answers, it has raised new questions and provided a glimpse of the significant challenges that lie ahead. It is clear, for example, that further discussion and consensus-building around the recommendations of the project presented to the OECD are necessary (OECD, 2000). In particular, OECD Member countries need to establish broad consensus on new competence areas for assessment at the international level and start mapping out a coherent strategy for the assessment of key competences of youth and adults. A significant research effort is needed to make substantial strides in the breadth of new competences that can be meaningfully included in large-scale assessments.

List of abbreviations

ALL	Adult literacy and life skills
DeSeCo	Definition and selection of competences: theoretical and conceptual foundations
IALS	International adult literacy survey
INES	International indicators of education systems [OECD's long-term programme on education indicators]
PISA	Programme for international student assessment

Bibliography

Binkley, M. et al. An overarching framework for understanding and assessing lifeskills. In: *Frameworks: working drafts*. Briefing materials for ALL Survey National Study Managers meeting held in Luxembourg, 23-24 September 1999.

Callieri, C. The knowledge economy: a business perspective. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 228-231.

Canto-Sperber, M; Dupuy, J.P. Competencies for the good life and the good society. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 67–92.

Carson, J. Defining and selecting competencies: historical reflections on the case of IQ. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 32–44.

Delors, J.; Draxler, A. From unity of purpose to diversity of expression and needs: a perspective from Unesco. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 214–221.

DeSeCo. Available from Internet: www.deseco.admin.ch. [cited 30.8.2002]

Farrugia, J.P. Competency management as an investment: a business perspective. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 93–120.

Fratczak-Rudnicka, B.; Torney-Purta, J. Competencies for civic and political life in a democracy. In: Rychen, D. S.; Salganik, L. H.; McLaughlin, M. E. (eds) *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

Gilomen, H.; Rychen, D. S.; Salganik, L. H. Concluding remarks. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 247–251.

Gonczi, A. Teaching and learning of the key competencies. In: Rychen, D. S.; Salganik, L. H.; McLaughlin, M. E. (eds) *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

Goody, J. Competencies and education: contextual diversity. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 175–190.

Harris, B. Are all key competencies measurable? An education perspective. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001 p. 222-227.

Haste, H. Ambiguity, autonomy and agency: psychological challenges to new competence. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 93–120.

Keating, D. P. Definition and selection of competencies from a human development perspective. In: Rychen, D. S.; Salganik, L. H.; McLaughlin, M. E. (eds) *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

Kegan, R. Competencies as working epistemologies: ways we want adults to know. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 192–204.

Levy, F.; Murnane, R. J. Key competencies critical to economic success. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual*

foundations. Göttingen: Hogrefe and Huber, 2001, p. 151–174.

Making a European area of lifelong learning a reality / European Commission. Luxembourg: Office for Official Publications of the European Communities, 2001 (COM(2001) 678 final).

Murray, T. S. Reflections on future international assessments. In: Rychen, D. S.; Salganik, L. H. (eds) *Key competencies for a successful life and a well-functioning society*. Göttingen: Hogrefe and Huber, 2003, p. 135-160.

Oates, T. Key skills/key competencies: avoiding the pitfalls of current initiatives. In: Rychen, D. S.; Salganik, L. H.; McLaughlin, M. E. (eds) *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

OECD. *Definition and selection of competencies (DeSeCo): theoretical and conceptual foundations* (Strategy Paper). Paris: OECD, 2002. Available from Internet: http://www. statistik. admin.ch/stat_ch/ber15/deseco/deseco_strat egy_paper_final.pdf. [cited 6.6.2003]

OECD. *The well-being of nations – the role of human and social capital*. Paris: OECD, 2001a.

OECD. *Investing in competencies for all.* Communiqué for the meeting of the OECD Education Ministers, Paris, 3-4 April 2001. Paris: OECD, 2001b. Available from Internet: http://www.oecd. org/pdf/M00008000/M00008906.pdf [cited 6.6.2003]

OECD. *Measuring student knowledge and skills: a new framework for assessment*. Paris: OECD, 1999.

Ouane, A. Defining and selecting key competencies in lifelong learning. In: Rychen, D. S.; Salganik, L. H.; McLaughlin, M. E. (eds) *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

Perrenoud, P. The key to social fields: competencies of an autonomous actor. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 121–150.

Ridgeway, C. Joining and functioning in groups, self-concept and emotion management. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and*

conceptual foundations. Göttingen: Hogrefe and Huber, 2001, p. 205–211.

Ritchie, L. Key Competencies for whom? A labor perspective. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 236–240.

Rychen, D. S. Introduction. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 1-15.

Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001.

Rychen, D. S.; Salganik, L. H. (eds) *Key competencies for a successful life and a well-functioning society*. Göttingen, Germany. Hogrefe and Huber, 2003.

Rychen, D. S.; Salganik, L. H.; McLaughlin, M. *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

Salganik, L. H. Competencies for life: a conceptual and empirical challenge. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 17–32.

Salganik, L. H. et al. *Projects on competencies in the OECD context: analysis of theoretical and conceptual foundations*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 1999.

Stein, S. *Equipped for the future content standards: what adults need to know and be able to do in the 21st century*. Washington, DC: National Institute for Literacy, 2000.

SFSO – Swiss Federal Statistical Office. *Country contribution process: summary and country reports*. Briefing materials prepared for DeSeCo's 2nd International Symposium, Geneva, 11-12 February 2002. Neuchâtel, Switzerland: SFSO, 2001a. (CCP Reports) Available from Internet: http://www.statistik.admin.ch/stat_ ch/ber15/deseco/deseco_country.htm) [cited 6.6.2003]

SFSO – Swiss Federal Statistical Office. *DeSeCo background paper*. Neuchâtel, Switzerland: SFSO, 2001c. Available from Internet:

http://www.statistik.admin.ch/stat_ch/ber15/deseco/deseco-background-paper02.pdf [cited 6.6.2003]

The World Bank. *Lifelong learning in the global knowledge economy: challenges for developing countries*. 2002. Available from Internet: http://www1.worldbank.org/education/pdf/Lifelong%20 Learning_GKE.pdf [cited 6.6.2003]

Trier, U. P. Defining educational goals: a window to the future. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 241-246.

Trier, U. P. Twelve countries contributing to DeSeCo: a summary report. In: Rychen, D. S.; Salganik, L. H.; McLaughlin, M. E. (eds) *Contribution to the second DeSeCo's symposium*. Neuchâtel, Switzerland: SFSO – Swiss Federal Statistical Office, 2003.

Weinert, F. E. Concept of competence: a conceptual clarification. In: Rychen, D. S.; Salganik, L. H. (eds) *Defining and selecting key competencies: theoretical and conceptual foundations*. Göttingen: Hogrefe and Huber, 2001, p. 45-66.

International symposia proceedings and papers

DeSeCo Symposium, Neuchâtel, October 13-15, 1999. Available from Internet:
http://www.statistik.admin.ch/stat_ch/ber15/deseco/deseco_symp99.htm
DeSeCo Symposium, Geneva, February 11-13, 2002. Available from Internet:
http://www.statistik.admin.ch/stat_ch/ber15/deseco/deseco_int02.htm

Further information

DeSeCo Secretariat
Dominique Simone Rychen
Program Manager
Swiss Federal Statistical Office
Espace de l'Europe 10
CH-2010 Neuchâtel

Phone: +41 (0)32 713 61 60
Email: dominique.rychen@bfs.admin.ch
Internet: www.deseco.admin.ch