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**DIRECTORATE FOR EDUCATION, EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS
EDUCATION COMMITTEE
GOVERNING BOARD OF THE CERI**

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**DEFINITION AND SELECTION OF COMPETENCES (DESECO):
THEORETICAL AND CONCEPTUAL FOUNDATIONS**

STRATEGY PAPER

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(Note by the Secretariat)

1. This document describes the main conclusions reached over the course of the program of work on the Definition and Selection of Competencies (DeSeCo) conducted under the OECD programme on education indicators (INES) over the period 1998-2002. The project was led by the Swiss Federal Statistics Office and supported by the US National Center for Education Statistics and Statistics Canada.

2. The focus of this Strategy Paper, prepared by the DeSeCo team, is on the theoretical and conceptual foundations for the definition and selection of key competencies, and their implications for the development, in the short, medium and long-term, of a coherent program for the assessment of key competencies.

3. This document has been considered by the INES Strategic Management Group (SMG) in preparation for the Joint Meeting of the Education Committee and the CERI Governing Board. SMG comprises members of those two bodies and also representatives of the Employment, Labour and Social Affairs Committee to which this document will also be referred.

4. The work of DeSeCo and this Strategy Paper along with the forthcoming Final Report, in particular, are of direct relevance to the development of the OECD Programme for International Student Assessment (PISA) and to any future programme assessing adult competencies. The document has been referred to the INES Network A on educational outcomes which undertakes developmental work for PISA. It will also be provided to any developmental group established to plan for assessments of adult competencies.

5. In the terms proposed by the Strategic Management Group, the meeting is invited to:
- EXPRESS its appreciation of the great value of the DeSeCo activity, and the effort which had gone into it;
 - WELCOME the report of DeSeCo and endorse its value as a foundation for further work;
 - NOTE and ENDORSE the particular importance of an overarching conceptual framework, such as that provided by DeSeCo, in underpinning the assessment of competencies;
 - DRAW ATTENTION to the value of the threefold DeSeCo categorisation (acting autonomously, using tools interactively, and functioning in socially heterogeneous groups) in mapping and further conceptualising key competencies.

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**DEFINITION AND SELECTION OF COMPETENCIES (DESECO):
THEORETICAL AND CONCEPTUAL FOUNDATIONS**

STRATEGY PAPER¹

**AN OVERARCHING FRAME OF REFERENCE FOR A COHERENT ASSESSMENT AND
RESEARCH PROGRAM ON KEY COMPETENCIES**

1. This document describes the main conclusions reached over the course of the DeSeCo program of work, 1998-2002, in particular as these concern theoretical and conceptual foundations for the definition and selection of key competencies, and their implications for the development, in the short-, medium- and long-term, of a coherent program for the assessment of key competencies.
2. The DeSeCo Steering Group² invites the OECD to:
 - ENDORSE the need for member countries to focus on and invest in key competencies for all that contribute to personal, social, and economic well being – as well as to invest adequate resources in foundation learning to ensure that everyone acquires and maintains the basic skills of reading, writing, and calculating.
 - AFFIRM a commitment to pursue a coherent program for the assessment of competencies to include both young people and adults and to be conducted on a regular cycle.
 - ENCOURAGE the use of the overarching conceptual framework provided by DeSeCo as a frame of reference for a coherent assessment program, including the development of assessment instruments, appropriate methodologies, and policy relevant indicators on the competencies of both young people and adults, as well as a coordinated research program.
 - ACKNOWLEDGE that future assessments should be further developed by building on the experiences of existing studies, in particular the Programme for International Student Assessment (PISA) and the Adult Literacy and Lifeskills (ALL) Survey. Significant research and development work is indispensable.
 - RECOGNIZE the benefits of international and interdisciplinary collaboration and the need to invest in a coherent research and development program that includes both theoretical and empirical work.
 - NOTE that the building and conduct of such a coherent assessment program is a long-term endeavor that will need sustained political and financial support over many years.
 - ESTABLISH, as a necessary first step, a coordinated long-term, interdisciplinary research and development activity under the auspices of OECD, and appropriate mechanisms for setting priorities and coordinating investments.

¹ This paper, an executive summary of the DeSeCo final report (forthcoming), was authored by Dominique Simone Rychen (Swiss Federal Statistical Office) and Laura Hersh Salganik (Education Statistics Services Institute, American Institutes for Research). The authors would like to acknowledge the valuable contributions of members of the DeSeCo Steering Group and express their thanks to the many individuals who commented on earlier drafts.

² The DeSeCo Steering Group is composed of senior officials of the sponsoring institutions, the Swiss Federal Statistical Office (Heinz Gilomen), the U.S. National Center for Education Statistics (Eugene Owen), Statistics Canada (Scott Murray), and of the OECD Secretariat (Barry McGaw, Andreas Schleicher).

- ENCOURAGE governments to implement, as a means to furthering the work on adult competence, a cyclical assessment, starting with the current ALL survey (with the possibility of a second round, provisionally scheduled for 2004-05) and followed by a common coherent assessment beginning in 2010.
- SEEK partnerships with other international organizations and to establish appropriate mechanisms for coordinating efforts related to international comparative assessments and indicators – as well as to the development of competencies in a lifelong learning perspective.

INTRODUCTION

Background

3. In response to an increasing interest in information about education outcomes and their effects and also to a need for a common overarching conceptual frame of reference for identifying and analyzing key competencies, the program “*Definition and Selection of Competencies: Theoretical and Conceptual Foundations*” (DeSeCo) was launched in December 1997 under the auspices of the OECD. DeSeCo is led by Switzerland and supported by the United States and Canada.

4. The conclusions and recommendations presented here result from this 4-year study conducted under the leadership of the Swiss Federal Statistical Office, in collaboration with the U.S. National Center for Education Statistics, Statistics Canada. It involved scholars representing different disciplines, experts from education, business, labor, health and other relevant sectors and leading representatives from international and national institutions and organizations.

5. The purpose of DeSeCo is to provide a theoretical and conceptual basis for defining and selecting key competencies and a solid foundation for the continued development of statistical indicators of individually based competencies in the future. It also aims to establish a reference point for interpreting empirical results in relation to the outcomes of learning and teaching. Further, it offers an input to the debate about which competencies should be given priority when education curricula and training programs are being reformed or reorganized.

6. The work of DeSeCo was designed to be complementary to past and current OECD international empirical studies, in particular the International Adult Literacy Survey (IALS), the Programme for International Student Assessment (PISA), and the Adult Literacy and Lifeskills (ALL) survey. Throughout the life of the project, DeSeCo has recognized the value of ongoing iteration between theoretical and empirical work, and has maintained close ties with these and other international surveys.

7. Recognizing that sustainable development, social welfare, cohesion and justice, as well as personal well-being, are closely bound to human and social capital, DeSeCo – as a theory- and policy-oriented study – has focused on fundamental questions related to desirable and important competencies from a broad interdisciplinary and international perspective.

8. DeSeCo’s focus is on competencies that matter both at the individual and societal level and in working life as well as life outside of work. The analysis and reflection in DeSeCo have not been restricted to what can be learned and taught in schools or to what is currently or readily measurable in large-scale assessments. The main goal of DeSeCo’s work is the conception of a broad overarching frame of reference relevant for both the development of individually based key competencies in a lifelong learning perspective and for the assessment of these competencies.

9. DeSeCo has concentrated on individually based competencies³. Defining competencies at the individual level, however, does not preclude the relevance of group or institutional competencies. However, the concept of collective competence raises other fundamental questions not addressed by DeSeCo.

10. The various contributions to the DeSeCo Program and the elaborated findings which are published in *Defining and Selecting Key Competencies* (2001), the symposium volume and final report (forthcoming in spring 2003) constitute relevant source and reference material for the continuing discussion about key competencies and for future research and development in this field.

Contribution of DeSeCo

11. DeSeCo offers theoretical and conceptual foundations for the definition and selection of competencies that lead to important economic and social outcomes. The conceptual insights produced by DeSeCo provide a basis for the elaboration of a coherent assessment and research program, which will result in a stronger theoretical underpinning for international surveys. DeSeCo offers a basis for building a consensus as to which new areas of competence should be included in future international comparative assessments, and which new statistical indicators of competencies should be developed for both young people and adults. Further, the proposed frame of reference constitutes a basis for situating existing domain-specific assessment frameworks and empirical results – particularly those from the PISA and ALL studies – in a broader conceptual context, and for making more explicit what is actually being measured and what is not.

12. DeSeCo's overarching frame of reference offers a starting point for the discussion of policies and programs for the development of key competencies in a lifelong learning perspective.

Relevance of information on key competencies for policy

13. Comprehensive comparative data on key competencies of young people and adults would serve a broad range of uses and users. Such data would be particularly important to public policy makers in two broad domains – economic policy and social policy, including education policy.

14. In the area of economic policy, comparative data would shed light on the degree to which a shortage of key competencies constitutes a barrier to achieving high rates of economic growth that, in turn, flow from high rates of technical, organizational and product innovation. These concerns are particularly acute given the rapidly increasing demand for competencies implied in advanced information-intensive production technologies and organizational structures. The relatively small size of incoming youth cohorts in OECD member countries, the removal of barriers to trade and the rapid growth of skilled labor in a range of developing countries contribute to the urgency of understanding the macroeconomic impact of key competencies on the performance of OECD members.

15. In the area of social policy, comparative data on competencies would contribute in several ways. Most importantly, such information would shed light on the degree to which competence, or the lack of it, poses a barrier to full and equitable participation in the labor market, generally or for specific groups. It

³ The terms “skills and “competencies” are not used as synonyms. Skills is used to designate an ability to perform complex motor and/or cognitive acts with ease, precision, and adaptability to changing conditions, while the term competence designates a complex action system encompassing cognitive skills, attitudes and other non-cognitive components.

would also allow for more thoughtful analyses of how competence fosters the development of social capital, including broader civic and democratic engagement and the maintenance of independence for senior citizens. Finally, monitoring the levels and social distribution of competence flowing out of the education system provides an important measure of educational efficiency.

Purpose of the paper

16. This paper presents, in a succinct form, the relevant elements of an overarching frame of reference that would make possible a common understanding of those competencies that are important for OECD member countries and possibly beyond, and would enable a coherent discourse to take place. It establishes definitional, normative, and conceptual criteria for the individually based competencies required for effective participation in modern democratic societies and for coping with broad societal problems and demands. It highlights a number of competencies that matter for an overall successful life and for a well-functioning society.

17. The main propositions and conclusions about competencies and related topics which have emerged from the DeSeCo project, together with some implications for a coherent assessment and research program, are put forward here for consideration by the OECD, and most specifically its Education Committee, the Employment, Labour and Social Affairs Committee and the Governing Board of its Centre for Educational Research and Innovation.

AN OVERARCHING FRAME OF REFERENCE FOR KEY COMPETENCIES

18. **For the purpose of strengthening the assessment of competencies and the indicators related to them, the OECD is invited to ENCOURAGE the use of the following perspectives as an overarching common framework.**

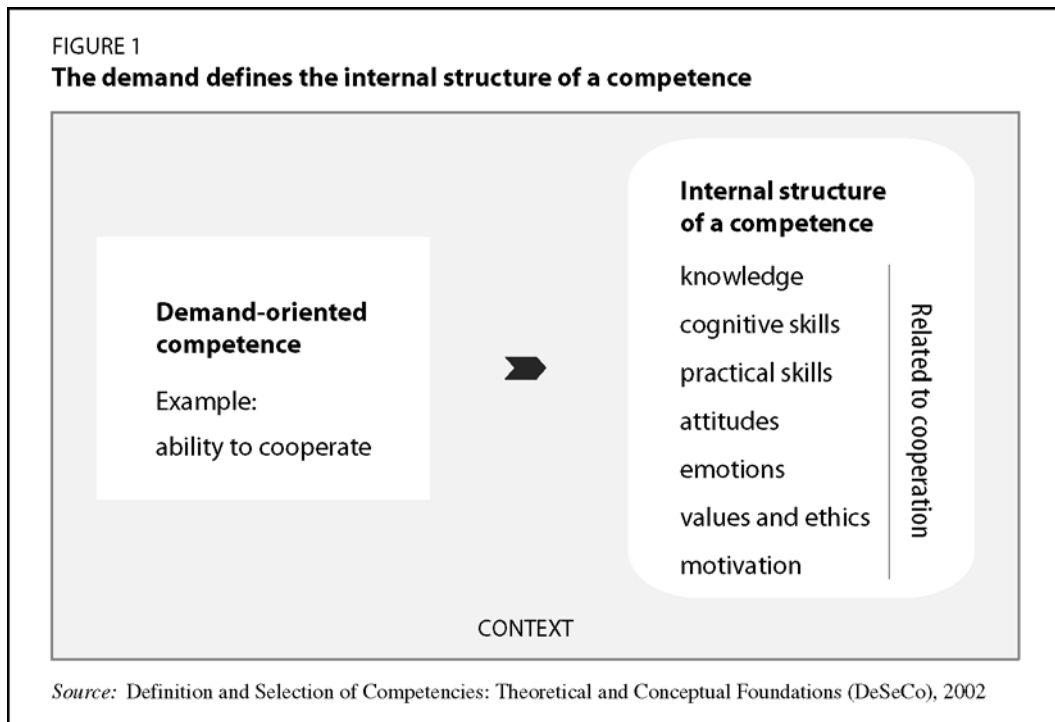
DeSeCo recommends:

The concept of competence

ADOPTING a concept of competence in which a competence is defined as the ability to meet demands or carry out a task successfully, and consists of both cognitive and non-cognitive dimensions.

19. A competence is defined as the ability to meet individual or social demands successfully, or to carry out an activity or task. This external, demand-oriented, or functional approach has the advantage of placing at the forefront the personal and social demands facing individuals. This demand-oriented definition needs to be complemented by a conceptualization of competencies as internal mental structures – in the sense of abilities, capacities or dispositions embedded in the individual. Each competence is built on a combination of interrelated cognitive and practical skills, knowledge (including tacit knowledge), motivation, value orientation, attitudes, emotions, and other social and behavioral components that together can be mobilized for effective action (Figure 1). Although cognitive skills and the knowledge base are

critical elements, it is important not to restrict attention to these components of a competence, but to include other aspects such as motivation and value orientation.



RECOGNIZING that competencies are only observable in actual actions taken by individuals in particular situations. External demands, individual capacities or dispositions, and contexts are all part of the complex nature of competencies.

20. Competencies are manifested (or observable) in the actions an individual undertakes in particular situations or contexts (i.e. both the immediate surroundings and the larger socio-economic and political environment). They do not exist internally, independent of action (which implies intentions, reasons and goals). This conceptualization is holistic in the sense that it integrates and relates external demands, individual attributes (including ethics and values), and context as essential elements of competent performance.

ACKNOWLEDGING that competencies are acquired and developed throughout life and can be learned and taught in a variety of institutions and other settings. A favorable material, institutional and social environment is necessary for the development of competencies.

21. A competence is developed through action and interaction in formal and informal educational contexts. Thus, competence development does not only refer to school-related teaching and learning. Besides the education system other institutions are also responsible for the transmission and development of the necessary competencies: the family, the workplace, the mass media, religious and cultural organizations and so on. Further, while the acquisition and maintenance of competencies is in part a matter of personal effort, it should be recognized that it also is contingent upon the existence of a favorable material, institutional and social environment, and appropriate social arrangements.

The concept of key competence

FOCUSING on key competencies, i.e. competencies that are important across multiple areas of life and that contribute to an overall successful life and a well-functioning society.

22. The notion of key competence is used to designate competencies that enable individuals to participate effectively in multiple contexts or social fields, and that contribute to an overall successful life for individuals and to a well-functioning society (i.e. that lead to important and valued individual and social outcomes). Consistent with the general commitment of OECD countries to expanding opportunities for individuals in various spheres of life, to improving overall living conditions in society, and to investing in the development of competencies for all as a means to these ends, key competencies are defined as being necessary for everyone.

23. Competencies that are domain-specific – i.e. do not apply across multiple relevant areas of life (for example, playing the piano or developing policy-relevant indicators), are not necessary for everyone, or are irrelevant to the betterment of individual and societal life – are not deemed to be key competencies. Some competencies, such as playing the piano, may be important for a successful life for particular individuals in some areas of life (such as making a living), but at this level of specificity they are not necessary for everyone and do not apply across multiple social fields (for instance, in the workplace, in family life, in the political sphere or health field).

24. DeSeCo's focus on key competencies does not question the relevance of domain-specific competencies. In fact, key competencies do not substitute for domain-specific competencies. These are necessary, and often constitute important resources for coping with the demands of particular contexts and situations.

RECOGNIZING that the definition and selection of key competencies depends on what societies value.

25. The definition and selection of key competencies is influenced by what societies value and by what individuals, groups, and institutions within those societies consider important. Therefore, as well as the definitional criteria outlined above, a common vision of the world as a normative reference point is necessary for identifying those competencies that foster social, economic, and personal well being.

ENDORISING the idea that basic principles of human rights, democratic values, and objectives associated with sustainable development constitute a common, normative basis for selecting key competencies.

26. A number of international conventions and agreements related to human rights and sustainable environmental, economic and social development constitute a solid basis for describing life and society as they *should* be (for example, The Universal Declaration of Human Rights or the Rio Declaration on Environment and Development). Thus basic principles of human rights, democratic value systems and postulated objectives of sustainable development (i.e. integrating environmental protection, economic well-being and social equity) can serve as a normative anchoring point for the discourse on key competencies, their selection, and development in an international context.

27. One way to validate key competencies is through examining their relationship with important desired outcomes. Consistent with these international agreements and broad societal objectives, some central characteristics of a successful life at the individual level include: access to economic resources; political participation and influence; access to intellectual resources and information; social networks; close relationships with others; physical and psychological health; personal security; and a sense of accomplishment and enjoyment. At the societal level, peace and security, equality and absence of

discrimination, economic productivity, democratic processes, social cohesion, the realization of human rights and environmental sustainability are critical dimensions that characterize the quality of a society. The question for validation is: Do the identified competencies make significant contributions to a successful life and a well-functioning society, in the sense of these broad desired outcomes?

28. It is also crucial to recognize that investment in individually based competencies constitutes only one strategy for generating sustained socio-economic development and improving living conditions in the world. Economic and social policies related to the production and distribution of goods and services remain a key issue.

Links between demands and the level of competence

RECOGNIZING that coping with the manifold complex demands and challenges of modern life facing individuals and society as a whole calls for the development of critical thinking and a reflective and holistic approach to life.

29. Increasing complexity and interdependence are central features of today's world. Societies and individuals are confronted by a plethora of old and new global problems and issues as well as by technological transformation, with varying effects and manifestations at all levels of life: substantial inequality of opportunities and poverty in its various forms; economic change; environmental threats; the digital divide; political instability and insecurity; the fragmentation of communities; new means of communication; and so on. These wide-ranging and varied demands of modern life challenge countries, communities, institutions, organizations, and ultimately individuals.

30. Many scholars and experts agree that coping with these complex demands – whether they are manifested in the workplace, in the political field, in the family, or in other areas of life – calls for the development of a higher mental level of complexity, a so-called self-authoring level that implies critical thinking and a reflective and holistic approach on the part of the individual. A self-authoring order of mental complexity means that individuals can step back from the many expectations and claims of their environment, think for themselves, act against the backdrop of a complex, interdependent and conflict-prone environment, take control over their actions based on their own feelings, thoughts, and values, act rather than be acted upon, and author their own life rather than play out the scripts of others. The requirement for this level of mental complexity is an important feature of the key competencies constructed in DeSeCo.

Three categories of key competencies as a conceptual basis

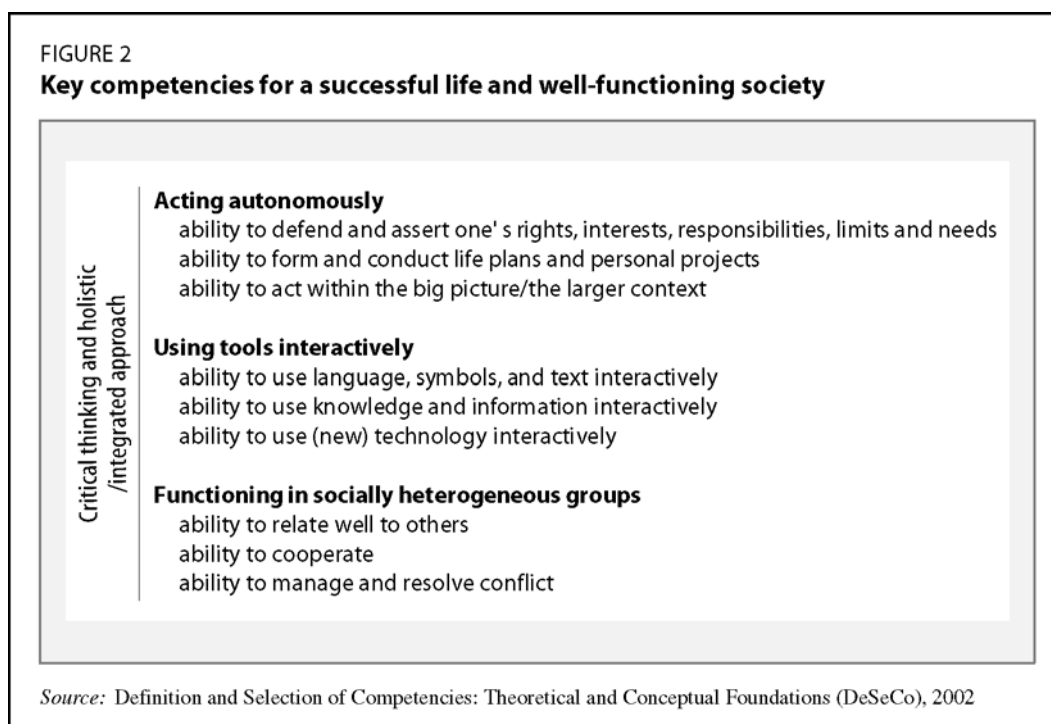
USING the three categories of key competencies established by DeSeCo - acting autonomously, using tools interactively, and functioning in socially heterogeneous groups - as a conceptual basis for mapping and describing key competencies.

31. Successful participation in the world of work, in the surrounding community and society, and in family and other social fields requires competent individuals. Based on a body of scholarly literature and on interdisciplinary insights, three theory-grounded, broad categories of key competencies have been constructed. The three categories of key competencies are acting autonomously, using tools interactively, and functioning in socially heterogeneous groups. These categories constitute a conceptual basis for mapping and further conceptualizing the key competencies identified.

32. Both the three categories and the key competencies proposed below (Figure 2) reflect the definition and criteria established in DeSeCo: they depend on a normative frame in which democracy and

respect for human rights are central features; they are considered valid internationally; and they are necessary for coping with complexity of modern life.

33. Although these three constructs are interrelated, each has a specific focus. The focus of “acting autonomously” is on relative autonomy and identity. “Using tools interactively” concerns an individual’s interaction with the world through physical and socio-cultural tools (including language and the traditional academic disciplines.) And the category “functioning in socially heterogeneous groups” emphasizes the individual’s interaction with the other, the different other.



Acting autonomously

34. 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 a given context. The concept concerns enabling and empowering individuals to develop and express a sense of self, exercise rights, and take responsibilities in the different spheres of life. The exercise of autonomy requires a general orientation toward the future, an awareness of one’s environment and an understanding of it that includes how it functions and how one fits into it. Acting autonomously does not mean functioning in social isolation. Instead it means that individuals manage their lives in meaningful ways by exercising control over their living and working conditions and by playing an active part in making their own lives.

35. The following key competencies are relevant when it comes to acting autonomously:

- the ability to defend and assert one’s rights, interests, responsibilities, limits and needs:

This key competence empowers individuals to put themselves forward as a subject of whom account has to be taken and to make choices as a citizen, as a family member, as a worker, as a consumer and so on.

- the ability to form and conduct life plans and personal projects:

This key competence enables individuals to conceptualize and actualize goals that make sense in their lives and are consistent with their values.

- the ability to act within the big picture/the larger context:

This key competence implies that individuals understand how the larger context functions, their position in it, the issues at stake, and the possible consequences of their actions and take these factors into account when they act.

Using tools interactively

36. The adverb “interactively” is important. To use a tool interactively and effectively 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. The word “tool” is used in the broadest sense of the term. It encompasses instruments that are relevant to meeting many important everyday and professional demands of modern society, including language, information and knowledge (including the content of the traditional school curriculum), as well as physical entities (such as computers and machines). A tool is not just a passive mediator but instrumental as part of an active dialogue between the individual and his or her environment. 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 with it, how we deal with transformation and change, and how we respond to new long-term challenges.

37. The following key competencies are relevant when it comes to using tools interactively:

- the ability to use language, symbols, and text interactively:

This key competence concerns the effective use of language and symbols in various forms and situations to achieve one’s goals, to communicate with others, to develop knowledge and potential. It allows individuals to make sense of the world and to participate in dialogues, and thus to interact effectively with their environment.

- the ability to use knowledge and information interactively:

This key competence concerns the effective use of information and knowledge. It enables individuals to manage knowledge and information and to use it as a basis for understanding options, forming opinions, making decisions, and taking actions.

- the ability to use (new) technology interactively:

This key competence concerns not only the technical skills required to use the technology in question – for example, a computer and its software – but an awareness of the new forms of interaction that are possible through the use of technology. This competence enables individuals to adapt their behavior in daily life to this potential.

Functioning in socially heterogeneous groups

38. In this category the focus is on the interaction with the “other”, the different other. For material and psychological survival, for a sense of self, identity, and social meaning, human beings are dependent on ties to others throughout their lives. Living and participating in multicultural societies and coping with increasing individual and social diversity require the ability to join and function in socially heterogeneous

groups. This category concerns the effective interaction with other individuals including those whose personalities and backgrounds are different from one's own. It concerns the development of social bonds and coexistence with people who do not necessarily speak the same language (literally or metaphorically) or share the same memory and history. They may adhere to different cultural values or come from different socio-economic backgrounds. These interpersonal or social competencies are particularly relevant for creating social capital.

39. The following key competencies are relevant when it comes to interacting effectively with other people:

- the ability to relate well to others:

This key competence allows individuals to initiate, maintain, and manage personal relationships.

- the ability to cooperate:

This key competence enables individuals to work together towards a common goal.

- the ability to manage and resolve conflict:

This key competence implies that individuals accept conflict as an inherent aspect of human relationships and approach its management and resolution in a constructive manner.

Constellations of key competencies

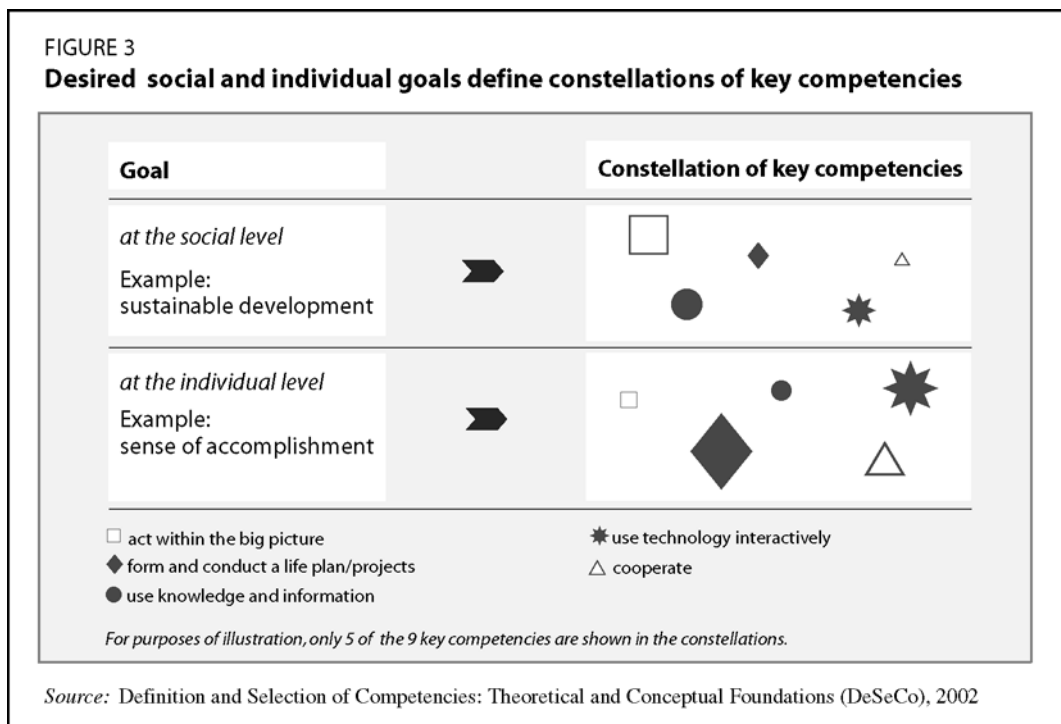
FOCUSING on constellations of key competencies rather than particular key competencies.

40. For individuals to lead a successful life and contribute to a well-functioning society, they need to be able to mobilize multiple key competencies. Key competencies, however, do not operate independently of each other, but in interrelated patterns. These patterns can be envisioned as constellations, whose forms depend on the individual or social goals in question. Thus, the goals define the constellation – the interrelating structure – of the key competencies and the particular importance of each competence within this constellation. In Figure 3, the illustrative example suggests that, for instance, for behavior consistent with the goals of sustainable development, acting within the big picture and using knowledge and information interactively are closely related and particularly important, as indicated by the different positions and sizes of the symbols.

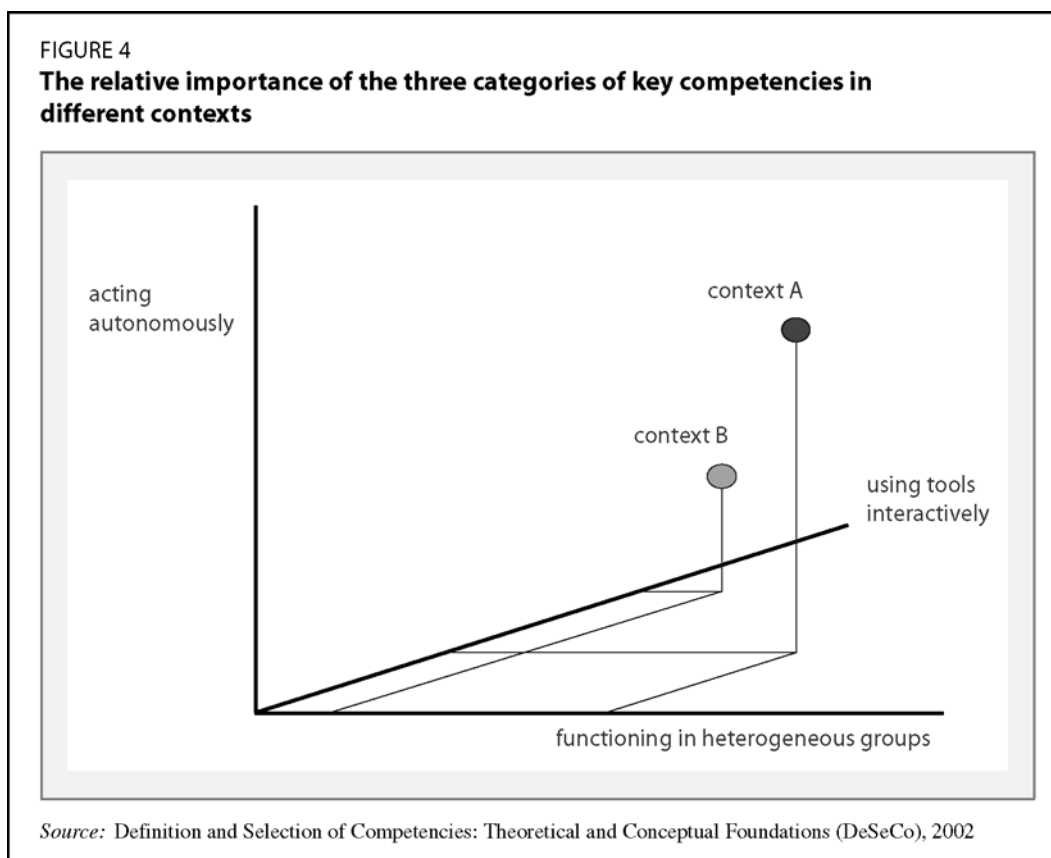
Contextual variation

RECOGNIZING that the socio-economic and cultural context determines the relative importance of the key competencies necessary for an overall successful life and a well-functioning society.

41. The specificities of the constellations, including the relative importance of the key competencies for an overall successful life and a well-functioning society, may differ depending on the socio-economic and cultural context. (Context here can refer to a range of entities, including countries, different social fields or areas of life.)



42. The relative importance of the key competencies for an overall successful life and well-functioning society in different contexts can be illustrated by conceptualizing a multi-dimensional space defined by the identified key competencies. For purpose of illustration/simplicity we limit the graphical representation to a three-dimensional space defined by acting autonomously, using tools interactively, and functioning in socially heterogeneous groups. Each dimension represents the relationship between competent performance through the mobilization of the key competencies represented in that category (for example “acting autonomously”) and a successful outcome. This may be a specific outcome – a sense of accomplishment, for example – or the totality of desired outcomes (i.e. an overall successful life and a well-functioning society). The graphical representation can be used to locate various contexts in the space depending on the relative importance of each of the three categories of key competencies for contributing to the desired outcomes. For instance, in Figure 4, acting autonomously and functioning in heterogeneous groups are more important in context A than in context B, whereas using tools interactively is more important in context B than in context A.



TOWARDS A COHERENT ASSESSMENT PROGRAM

43. The OECD is invited to recognize the implications of DeSeCo's work for the development of a coherent cyclical assessment program that includes youth and adults and policy-relevant indicators. To this end, DeSeCo RECOMMENDS that a future program of assessment of competencies should develop both the conceptual understanding and the organizational know-how needed to advance this work in a number of areas.

Implications of conceptual issues

44. Among conceptual issues that need to be addressed, DeSeCo recommends that further work should:

CONSIDER the complex nature of key competencies and their multi-dimensional reference points.

45. It is important to acknowledge that there are multiple, interrelated key competencies, each of which includes aspects such as attitudes, motivation and emotion as well as cognitive elements. Assessments therefore should seek to integrate and relate cognitive and non-cognitive dimensions, and these, also, should be related to social, economic and political contexts as well as desired outcomes, broadly defined. Another challenge for assessment is to explore the patterns which make up the constellations, the interplay among the various key competencies. To do justice to the multi-dimensional reference points of key competencies, to measure them validly and reliably and to interpret the significance of the results, a variety of methods need to be considered. Relevant data may be derived from multiple sources, including but not limited to the collection of data through large-scale assessments.

TAKE INTO ACCOUNT that competencies and their components exist on continua ranging from the low basic level to the high self-authoring level of competence.

46. Competencies are assumed to exist on continua, although further research is necessary to more fully conceptualize this idea. It is therefore not a matter of assessing whether an individual does or does not possess a particular competence or a component, but rather of determining where along the continuum from a low to high competence level an individual's performance falls. It is important that frameworks and items in assessments of key competencies include the complete range. This should include the self-authoring level of mental complexity, in which individuals ground their decisions and actions in critical thinking and a reflective/integrative/holistic approach (see paragraphs 29-30). By recognizing the existence of continua (or continuous scales, using more technical terms), levels of proficiency (i.e. bands of scores along the scales) can then be identified for analytic purposes and for aiding interpretation of the scores.

INCLUDE both young people and adults.

47. Psychology has shown that competence development does not end at adolescence but continues through the adult years. Cognitive and non-cognitive development proceeds in terms of changing internal mental structures rather than simply adding new pieces to a set of knowledge items. Further, evidence shows that competencies can deteriorate or be lost altogether if they are not actively used. As a result, assessments of competencies of young people alone cannot preview the full picture of key competencies of adults.

USE the three categories of key competencies as an overarching conceptual basis for mapping and further conceptualizing the key competencies identified.

48. The three broad categories of key competencies, acting autonomously, using tools interactively, and functioning in socially heterogeneous groups are proposed as a conceptual basis for the development of statistical indicators of individually based key competencies. They can also act as a reference point for interpreting empirical results about learning and teaching outcomes.

49. The DeSeCo process afforded an opportunity to examine the theoretical justification for what has been measured to date in ALL and PISA, for example, reading literacy, mathematical literacy/numeracy, and scientific literacy. The DeSeCo work confirms the theoretical relevance of these competencies to the category using tools interactively and places them in a larger theoretical context. Analysis of data from the available studies documents the existence of significant variation of these measures, both within and between countries, and confirms that these competencies are socially and economically important.

50. Future assessment should therefore be guided by DeSeCo's conceptual work and build on the experiences of PISA and ALL by taking advantage of these conceptual, theoretical, and empirical frameworks that currently can support internationally valid, reliable, and comparable assessment of competencies.

DIRECT efforts to develop assessments of new competencies related to acting autonomously and functioning in heterogeneous groups.

51. With the exception of initial efforts related to acting autonomously (self-regulated learning in PISA) and functioning in socially heterogeneous groups (exploration of teamwork for ALL), international comparative assessments have focused on competencies which are related to using tools interactively – an area for which theory provides a basis for measurement. Future research efforts in the field of key competence should concentrate on the development and validation of measures related to acting autonomously and functioning in socially heterogeneous groups. Key competencies in these areas are much more socially and culturally embedded concepts, a fact that must be taken into account in the development of internationally comparable measures. The primary focus on new competence domains should not preclude continued research and development of the competencies included in the category using tools interactively, in particular with respect to representation of the self-authoring level. (See paragraph 30 for a description of the self-authoring level of mental complexity.)

52. Significant progress in the opening up of new competence domains for coherent assessment will take time and cannot be expected to yield ready-made measures in the near future. A significant research effort is needed to make substantial strides in the breadth of new competencies that can be meaningfully included in large-scale assessments.

DESIGN a coherent assessment program guided by the information needs of policymakers.

53. The design of a coherent assessment program of competencies needs to be guided by the desired statistical indicators relevant to social and economic policy. For example, in order to provide profiles of the distribution of competence across different social and economic groups, it is necessary to include the appropriate background variables. Data from studies such as PISA, IALS, and TIMSS have already demonstrated that significant differences exist both within and between countries with respect to the level and social distribution of competence. The factors that underlie changes in the availability of competence to societies are also of policy interest. Ideally, such understanding would flow from longitudinal studies. But in their absence, a regular cycle of cross-sectional surveys can serve to monitor trends, including changes that can be attributed to improvements in the quality of education or educational expansion. Finally, as with any survey data, variation is necessary to identify statistical relationships. Understanding the factors that lead to the acquisition of competencies and the degree to which they influence outcomes all require data from a significant number of countries that are themselves heterogeneous with respect to competence, context and outcomes. Such heterogeneity can only be found outside the OECD context, suggesting a necessity for partnerships with other international organizations to enable collection in developing countries.

Organizational considerations

NURTURE the dialogue between policy makers and researchers as part of the development process.

54. Good governance and effective policy-making rely on information, data, and statistics, which are based on sound foundations. This requires a sustained dialogue and exchange between policy makers and researchers. With regard to key competencies, policy makers need to reach consensus on the value of measuring some key competencies or components of competencies and not others (considering factors such as whether they are amenable to policy manipulation), and researchers need to provide further conceptual input during the consensus process and guidance on the feasibility of developing valid and reliable measures of new theory-grounded constructs. It is important to provide a forum that allows for the

joint participation of the research community and policy makers. The concepts developed so far should and could be used also in the processes of reflection associated with other ongoing work related to competencies and thus influence policy development.

ESTABLISH appropriate institutional mechanisms for supporting and coordinating research and development and coherent assessment programs.

55. Building a coherent assessment program based on solid theoretical and conceptual foundations is by necessity a long-term endeavor. Further development of both strands, the theoretical and empirical, requires applying a combined top-down and bottom-up approach. Meeting this challenge represents a major task, one that will need to be given sustained political and financial support over many years. A coordinated long-term research and development activity under the auspices of the OECD requires appropriate mechanisms for continuing the theoretical and conceptual activities that underpin the work, setting priorities and channeling resources, and coordinating the necessary investments. These should include existing forums such as the Indicators of Education Systems (INES) Network A, which was responsible for developmental work that led to the assessment domains for PISA. The OECD should also, more generally, play a role in ensuring a sustained interdisciplinary, research-oriented approach to the topic.

56. Although the work of DeSeCo was undertaken in the context of OECD countries, the UNESCO Institute for Statistics, the World Bank, the United Nations Secretariat, the United Nations Development Program and the International Labour Organisation have indicated their interest in the topic and in DeSeCo's overarching conceptual work. Partnerships with these and other organizations will need to be further explored to facilitate participation of non-OECD countries in the debate on key competencies and their assessment.

57. Experience suggests that it is important to separate framework development and data production from data use, particularly where the data are politically sensitive. Governance and management of competence assessments should build on the institutional partnership model, with responsibility for the scientific coherence of the study resting with the executing consortium, and strategic oversight and guidance remaining the responsibility of the committee of participating countries.

58. It is important to recognize that there is a risk that the overarching conceptual approach and the necessary iterative process will be lost unless they are given a specific place in the organizational structure quite separate from efforts targeted to specific surveys, with appropriate dedicated funds. DeSeCo's approach of bringing together countries and experts from different disciplines, sectors, and organizations, and of organizing symposia as a means for debate, exploration and reflection for a diverse audience is a recommendable model for maintaining a broad, interdisciplinary and policy relevant perspective on the topic and for maintaining an iterative relationship between theoretical and empirical work. For instance, a third international symposium focusing on the current "state of the art" in relation to key competencies and their contribution to desired outcomes could be scheduled for five years' time. By then, results from PISA and ALL will be available to speak empirically to issues raised by the work of DeSeCo.

ENCOURAGE governments to implement an assessment of adult competencies that is conducted on a regular cycle, starting with the current ALL assessment and followed by a common assessment beginning in 2010.

59. From the perspective of a coherent long-term assessment program built on DeSeCo, it is highly desirable to implement an assessment of adults with a common cyclical schedule – analogous to the PISA model of rotating emphases in the cycle of assessments. Thus, as a first step and as a means to furthering the work on adult assessment in the long term, the OECD is invited actively to encourage countries to

participate in the current ALL survey in 2002-03 or in a second round provisionally scheduled for 2004-05. Depending on whether or not they participated in IALS/SIALS, participation in the current ALL survey would provide countries with first or second measures related to literacy.

60. Widespread participation of countries would increase the policy interest in the data flowing from ALL by offering broader, international comparisons. It would also increase the scientific utility of the ALL survey. For example, it would increase the heterogeneity of data, which is important for identifying underlying causal structures. Further, a second observation for those countries that participated in IALS/SIALS would provide important information on the rate at which competence profiles evolve in adult populations. Such information is indispensable for determining the optimal period of time which should elapse between measurements.

61. Apart from increasing the scientific utility of the current adult assessment and its policy interest, widespread participation in the current ALL study in 2002/2005 is desirable in order to facilitate the movement of countries towards a common schedule for adult assessment, which would be beneficial both for policy-related reasons and for enhancing the scientific utility of the assessment program. Limiting the current ALL survey to a single second cycle of collection in 2004-05 would open the way to the implementation of an all-country adult assessment on a common schedule in 2010.

62. The 2010 adult assessment should focus on competencies in the domain of functioning in socially heterogeneous groups. Concentrated research and development in this domain will be necessary, building on the efforts undertaken in ALL to measure teamwork and cooperation. Relevant items related to using tools interactively should be retained as a minor focus to maintain continuity across assessments and to develop a better understanding of how key competencies manifest themselves and form constellations in different socio-economic and cultural contexts (Figure 5).

FIGURE 5

Cyclical structure of a coherent adult assessment program

Category \ Time frame	Using tools interactively	Functioning in heterogeneous groups	Acting autonomously
2003/2005	Main focus (e.g. literacy, numeracy)	Explorative (teamwork)	---
2010	Minor focus	Main focus	Explorative
???	Minor focus	Minor focus	Main focus

Source: Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo), 2002

RESEARCH AGENDA FOR THE FUTURE

63. **The OECD is invited to RECOGNIZE the importance of and need for a co-ordinated research agenda and continued interdisciplinary collaboration and to ENCOURAGE continued fundamental research and development work on the topic of key competencies.**

64. In particular, DeSeCo recommends activities along two tracks:

INVESTING in research activities related to the development of assessments in the short- and medium-term:

Review of existing literature and current activities

65. An important first step in moving from a broad conceptual framework toward a coherent assessment program is to review existing literature and current activities at the international level that relate to the conceptual framework developed by DeSeCo and have potential for contributing to future efforts.

66. DeSeCo's country contribution process showed that a variety of interesting and relevant initiatives and activities which are related to key competencies exist at the country level, some of them conducted in different sectors. The relevance of these national efforts and experiences should be explored from the international stance when developing assessment programs, choosing appropriate methodologies, and analyzing results.

67. As current activities in the INES Project and OECD have demonstrated (for example, in the cognitive domains in PISA and ALL), development activities are often most effective when they build on successful experiences with similar activities at the national or local levels. This component, or phase, of assessment development may be thought of more broadly as "literature and environmental scans".

Specification of domain- specific frameworks and instruments

68. DeSeCo provides an overarching conceptual framework on which an assessment program can be built. However, while this framework clearly, and with a strong theoretical basis, identifies three categories of key competencies and within them a number of key competencies, there is much work to be done in further developing the categories and the competencies as domains for assessment – i.e. specifying domain-specific assessment frameworks and instruments. This would include activities such as: developing working definitions of the domains; describing the assumptions that underlie the definitions; determining how assessment tasks should be organized; identifying key task characteristics and how they can be operationalized; and suggesting schema for interpreting results.

Exploration of adequate methodologies

69. Recognizing the ever more fundamental and widespread role that technology plays in OECD countries, this strategy paper anticipates that within the next ten years, there will be a demand for, at the least, computerized delivery of assessment and, at the most, fully adaptive and interactive assessment. In addition to allowing for more efficient use of testing time, going beyond "pen and paper" tests offers the potential for including tasks that are similar to those outside the assessment situation, thus enhancing the

validity of assessments across different contexts. Because many technological barriers (such as different operating systems or different degrees of access) currently exist, the development of technology platforms that are effective and practical is another important topic for future research and development.

70. Further development work on methodologies which differ from traditional assessment techniques – such as the use of portfolios or performance assessments – should be encouraged to capture the expression of key competencies more accurately. In the shorter term, it could be explored whether – as a parallel activity to the development of assessment instruments – existing work could contribute to developing indicators of best practice using the conceptual framework provided by DeSeCo.

Validation and continuous refinement of the overarching conceptual framework

71. Continued progress will depend on the refinement of DeSeCo's overarching conceptual frame of reference used to guide the selection, measurement and interpretation of data from assessments related to adults and young people. The consolidation of this frame of reference for key competencies as proposed by DeSeCo can only be accomplished through a sustained iterative process of confrontation with empirical data. Thus, conducting empirical studies is crucial for investigating the validity of the framework and to propose refinements. An important and necessary step is the systematic analysis of the existing assessment frameworks prepared for international assessment programs (in particular PISA, IEA school-based surveys, and ALL). It should be possible to situate them in a systematic manner within the overarching conceptual frame of reference, in particular with regard to the three categories for key competencies proposed by DeSeCo.

INVESTING in theory-oriented, interdisciplinary research

Enhancing the development of key competencies

72. Key competencies are assumed to be – at least to some extent – learnable and teachable. The learnable and the teachable elements, therefore, need to be specified. Clearly, school is and remains an important institution responsible for providing learning and teaching opportunities. However, other institutions are also responsible for fostering many of the key competencies identified. The specific roles that various social institutions play in enhancing the development of key competencies, and the most effective pedagogical strategies and methods, need to be further explored within a lifelong learning perspective.

Key competencies and their contribution to desired outcomes

73. Following the logic of human and social capital, key competencies are defined as competencies that potentially contribute to important valued outcomes, i.e. a successful life in terms of quality of life and a well-functioning society in terms of the quality of the society. Further research is needed to specify the conceptual linkage, at the micro and macro level, between key competencies and the desired outcomes, including, but not limited to, economic performance. DeSeCo's work, in particular the three categories of key competencies, should be linked to OECD's work on human and social capital and the insights should feed into the overarching frame of reference for key competencies. In addition, broader measures of success and well-being will need to be considered. The relevance of concepts and tools from normative economics, social choice theories, and theories of distributive justice should be explored.

Contextual variation

74. The hypothesis that many underlying overall social objectives, such as sustainable development and personal security, are universal is complemented in DeSeCo's conceptualization by the idea that these objectives take different forms, depending on the broad social context of values and social conditions. Further, these contextual elements influence the constellations of competencies that underlie successful action as well as the internal structure of competencies. Depending on the context, meeting the same demand may require a different competence base. In addition, competencies eventually need to fit the many different roles that individuals are called upon to fulfill in their society and throughout their lives. Further research is needed to establish how the identified key competencies play out in different situations for different roles or groups at different stages of life. The ubiquitous influence of different aspects of context on different facets of competencies is an important topic for additional theoretical and empirical research.

Applicability of DeSeCo's framework beyond the OECD

75. United Nations agencies with global mandates share similar concerns about empowering people to help themselves in alleviating poverty and furthering democracy. Although the work of DeSeCo was undertaken for and in the context of OECD, the hypothesis is that the overarching conceptual frame of reference - and in particular the three broad categories of key competencies - have global validity, though the specificities may differ. The applicability of DeSeCo's framework beyond the OECD context needs to be further explored.

Broad and important demands in the economic, political, and other social fields and their implications for the mental structure of competence within the individual

76. A systematic analysis and description of the relevant features of the important personal and social demands facing individuals is necessary, as they define the mental structure of a competence. Much attention has been given to such demands as they play out in the economic environment at the micro and macro level. Further attention needs to be given to their manifestation in other important contexts that are relevant to general performance and well-being of individuals.

Individual competencies and group competencies

77. Defining competencies at the individual level does not imply that group and institutional competencies are less relevant. Within the DeSeCo study, the focus has been on the individual rather than on the concept of collective competence. The latter focuses on the prerequisites needed by a group to meet certain demands, which raises other fundamental questions not addressed by the DeSeCo project.

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