

Definition and Selection of Competencies

Projects on Competencies in the OECD Context

Analysis of Theoretical and Conceptual Foundations



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Foreword

Rapid changes in economic, social, and political life, including those related to the advent of new technologies and on-going globalization, pose major challenges in today's world. Individuals, communities, work organizations and nations increasingly recognize that their future well-being depends on high levels of knowledge, skills, and competencies. This recognition, together with an increased focus on the outcomes of education, has led policymakers to seek out information about skill levels of the population and about the effects of education, training, and informal learning on those skills.

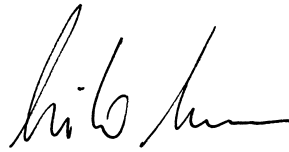
To inform the policy-making process, OECD is developing internationally comparable indicators of skills and competencies, and of their roles in promoting individual, social, and economic well-being. To this end, OECD Member countries are collaborating on the development of a range of instruments designed to deliver reliable and policy-relevant measures on learning outcomes and on the distribution of skills in the population.

While the development of the empirical components of these efforts is well underway, there is a clear need to further advance the theoretical underpinnings of the assessment of skills and competencies. As a contribution to such work, the Swiss Federal Statistical Office has launched, within the framework of the OECD indicators project, a three-year program, entitled *Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo)*, with the aim of identifying a set of competencies that are needed by both children and adults to lead responsible and successful lives in a modern, democratic society and for society to face the challenges of the present and the future. The program also seeks to advance the development of a common, overarching theoretical framework for the identification of key competencies that can provide a basis for more accurate and appropriate measurement of competencies and interpretation of empirical results.

International and interdisciplinary collaboration are key elements of the program; distinguished scientists, policymakers, and leading representatives of economic and social institutions are contributing to the work.

The first major activity of the DeSeCo program was an analysis of previous INES-related activities that address issues related to the selection, definition, and operationalization of skills and competencies: the Cross-Curricular Competencies Project, the International Adult Literacy Survey, and the Human Capital Indicators Project.

This report presents the findings of the analysis, which was based on a review of project documentation as well as interviews with key actors in each of these projects. It also briefly discusses several ongoing studies.



Heinz Gilomen

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Main Theses

This report is based on the study of three completed projects in the OECD context: the International Adult Literacy Survey, the Cross-Curricular Competencies Project, and the Human Capital Indicators Project. While ongoing projects are also briefly described, the conclusions and theses of the report reflect the analysis of the completed projects. In several cases, the ongoing projects have displayed a sensitivity to the issues detailed below, and in that sense, reflect development beyond the earlier projects. At the same time though, the authors believe that the conclusions and theses remain a key resource for the ongoing projects as they continue their development and for future projects as well.

Decentralization. Growing demand by national authorities for output-oriented information about education has resulted in a number of projects in the OECD context. Although their goals are related, these projects have operated more or less independently, with minimal conceptual and organizational coordination related to selecting and defining competencies. The process of definition and selection has been largely determined by individual initiatives and particular national interests rather than an overarching strategy.

Broad conception of indicators. Each of the studies adopted a broad conception of competencies and outcomes of education. This includes the viewpoint that the desired outcomes of education are broader than the acquisition of subject-related knowledge typically taught in school and that the idea of competencies extends beyond the school context. The notion of preparation for life has become a leading theme in the process of definition and selection of competencies within the OECD context.

Focus on indicators and measurement. Feasibility of measurement was a major concern in the selection and definition of competencies in each of these projects. Although not always the goal at the onset, each of the projects eventually gave priority to empirical testing of concepts by applying existing methodologies, instruments, and, when possible, existing data. Production of indicators was of prime importance.

Limited theoretical and conceptual development. Theoretical and conceptual issues were not at the forefront of these projects. For the CCC project, there was little scientific base from which to draw and the question of whether it was feasible to develop measures took priority over conceptual and theoretical issues. The scientific foundation previously developed in the United States was a key factor in the selection, conceptualization, and measurement of adult literacy for the IALS. The HCI project expanded the classical conception of human capital, but its priority was the development of indicators based on existing data. In addition, studies were not concerned with how competencies are interrelated. No strategy was developed for addressing theoretical and conceptual issues.

Accomplishments and the need for future involvement of the scientific community. Taken together, the studies succeeded in providing a great deal of information for policymakers and in generating interest in competencies beyond the field of education and support for efforts that are currently underway. However, because limited resources were available on the international level for conceptual and theoretical work, the studies drew mainly from the existing scientific base. Because of the need to expand that base, close cooperation with the scientific community in future efforts to define, conceptualize, and measure competencies is crucial to the future success of work in the domain of competence.

Introduction

Background

Recognizing an increasing demand for comparative statistical information about education in member countries, the OECD launched the INES project (Indicators of National Education Systems) in 1987. The project initiated a number of international working groups, each focusing on a particular area and providing a venue for exchanging viewpoints and achieving a common understanding of issues. The overall purpose was to improve the gathering and reporting of information about education. One of these groups – Network A – was given the task of developing indicators of learning outcomes (see Annex A for additional information about INES Networks).

It was apparent from the beginning of the work of INES and Network A that data providing direct measures of learning outcomes were extremely limited. Indicators of the math achievement of 13-year olds, published in the first edition of *Education at a Glance* in 1992 (OECD, 1992), were identified as provisional because of their experimental nature. Efforts such as those which provided data for these indicators (the IAEP study conducted by the United States and the Second International Math Study conducted by the IEA¹) were conducted at irregular intervals and only in selected areas of the school curriculum. Further, these studies were defined by subjects in the school curriculum, and did not reflect more general competencies applicable in multiple curricular areas or competencies needed for life outside of schools. Finally, direct measures of the knowledge and skills of adults were nonexistent.

At the same time, there was a growing demand from national authorities for output-oriented information about schools. Whereas

¹ The International Assessment of Educational Progress (IAEP) was a project conducted by the Education Testing Service utilizing the methodology of the United States' National Assessment of Educational Progress (NAEP) on an international scale (Lapointe, et al. 1992a, 1992b). The International Association for the Evaluation of Educational Achievement (IEA) is an association of research institutions, universities, and ministries of education in over 45 countries. The IEA has conducted numerous studies focusing on educational policies and practices. The following IEA studies were used in preparing the 1992-1997 editions of *Education at a Glance*: The Second International Mathematics Study (SIMS), the Reading Literacy Study, and the Third International Math and Science Study (TIMSS).

policy-makers had previously relied on information about school enrollment and attainment to monitor the performance of the education system, there was now a call for information about system outputs.

This situation presented several challenges. One was the need to develop a regular source of data to provide indicators for the annual publication of *Education at a Glance*. Further, whereas the broad categories of school curriculum are relatively well institutionalized and also relatively common across industrialized – and even non-industrialized – countries, the same cannot be said for competencies or outcomes outside of curriculum categories. And although studies in a number of OECD countries have conceptualized a set of skills needed for work, there is no general understanding about competencies needed for life that are recognized within most countries, let alone internationally. Thus, although there is a broad consensus that there are important learning outcomes that do not correspond directly to curriculum areas, that consensus does not extend to just what these outcomes are.

The response to these challenges within the OECD context has been a decentralized one. Since the inception of INES, a number of different projects have worked towards conceptualizing and developing new measures of learning outcomes or competencies for both school-aged children and adults. These include the Cross-Curricular Competencies Project (CCC) within Network A, the International Adult Literacy Survey (IALS), the Human Capital Indicators (HCI) Project, and more recent projects such as the International Life Skills Survey (ILSS) and the Program for International Student Assessment (PISA). Although many individuals have participated in more than one of these projects, and some conceptualizations of particular competencies are included in more than one project, there has been minimal conceptual or operational coordination across the range of projects.

Purpose of this Report

This report is an initial activity of a three-year OECD program entitled *Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo)*, which has been launched by the Swiss Federal Statistical Office, which chairs the program with support from the U.S. National Center for Education Statistics (NCES). *DeSeCo* seeks to develop a theoretically grounded conceptual framework for under-

standing the skills and competencies needed to lead a personally and socially worthwhile life in a modern democratic state. The overarching goal is to provide general reference points for further theoretical development and future work in the measurement of competencies. Key to the project is the idea that the work should be accomplished in an international and interdisciplinary environment, with the purpose of creating a common understanding of issues.

The purpose of this report is to explore and clarify what *DeSeCo* can learn from previous projects related to competencies that have evolved within the INES framework: CCC, IALS, and HCI.² Toward that end, the report provides a broad overview of the projects and attempts to identify the theoretical and conceptual considerations that influenced their development. The analysis includes both the explicit scientific theories and the cultural and normative assumptions that are embodied in the projects. Further, the studies' original intentions and how they evolved throughout development and implementation phases are discussed. The report concludes with a brief description and discussion of ongoing projects, but does not present an evaluation of any of the projects.

The research questions guiding the study cover the progress of the projects from the initial selection of competencies through to the projects' completion. Major topics include:

- **Selection of Competencies:** rationale for selection of competencies; advocacy of particular competencies by countries or political groups;
- **Definition and Conceptualization of Competencies:** Scientific and theoretical contexts and implicit assumptions influencing how the competencies were conceptualized; and

² Within the INES project, there were two other approaches to developing indicators going beyond or across curriculum subject lines: the Goals Orientation and Attainment in Learning Systems (GOALS) project and a public opinion survey. The GOALS project aimed to identify a range of goals for education systems so that this information can be taken into account when developing measures of outcomes of education (Granheim and Pettersson 1995). The public opinion survey asked members of the public for their views about the importance of both school subjects and cross-curricular goals such as developing self-confidence and a desire to continue learning (OECD 1995b). Because these projects were not primarily concerned with the outputs of education, they are not analyzed in depth in this report.

- **Empirical Considerations:** Measurement and operationalization of concepts; frameworks for empirical results.

Methodology

Two types of sources provided information for this report. The first were the documents produced by the projects (see References for a list of these documents). The second were semi-structured interviews with key actors. The following individuals were interviewed during the spring of 1998: Tom Alexander, OECD; Marilyn Binkley, National Center for Education Statistics, U.S. Department of Education (NCES); Norberto Bottani, Service de la Recherche en Education, Geneva, formerly OECD; Helmut Fend, University of Zurich; Jeanne Griffith, National Science Foundation (U.S.), formerly NCES; Tom Healy, OECD; Douglas Hodgkinson, British Columbia Ministry of Education; Walo Hutmacher, education consultant, formerly Service de la Recherche en Education, Geneva; Scott Murray, Statistics Canada; Eugene Owen, NCES; Jules Peschar, University of Groningen; Judith Torney-Purta, University of Maryland at College Park; Uri Trier, University of Bern; and Albert Tuijnman, University of Stockholm, formerly OECD (see Annex B for the interview protocol).

For each project, we begin with a brief description and continue with a discussion of the selection and definition process of the competencies and empirical considerations. Evolution of the projects as they progressed from initial ideas to a working project and project accomplishments are discussed when appropriate within the major topic areas. We begin with two projects that began in the early 1990s, CCC and IALS. Then we discuss the Human Capital Indicators Project, which was initiated in 1996 and recently released a report. We conclude with brief descriptions of five ongoing projects: the International Life Skills Survey (ILSS), the Program for International Student Assessment (PISA), the current work in the CCC project, the IEA Civic Education Study, and the Third International Mathematics and Science Study (TIMSS and TIMSS-R).

Cross-Curricular Competencies Project (CCC)

Description

The term *Cross-Curricular Competencies* (CCC) used in the OECD context refers to a domain of competencies that includes knowledge and skills related to outcomes of education in a broad sense, as responding to needs from both the social and economic spheres of life. The underlying crucial question is “what do young adults who completed their formal education need in terms of skills so as to be able to play a constructive role as a citizen in society?” (Trier 1991)

Work in this general area was initiated in the early 1990’s in the INES project as a reaction to the ongoing development of indicators of student achievement based on available data in the domain of school and subject-related learning outcomes. The proposed classification distinguished two categories of achievement indicators: on the one hand, the so called *curricula bounded knowledge and skills* based on the question of what (and how much of it) do children learn in schools, and, on the other hand, what was initially called *non-curricula bounded socio-cultural knowledge and skills* (NOBS³) based on the question of whether the knowledge and skills needed to live an individually worthy and socially valuable life in our societies are provided through education (and if so how much of them) (Trier 1992). At the time, it was assumed that the indicators that were developed would measure the knowledge and skills of adults having finished formal education, e.g., at the age of 18.

Within Network A, the group in INES responsible for the development of outcome indicators, there was broad support for pursuing this track and including the CCC issue in the planned activities. The main objective was to produce a set of empirically tested instruments to measure CCC. To operationalize the idea of cross-curricular competencies through a set of instruments measuring a *minimal level of competence*, the concept of a *survival kit* was proposed. The suggested areas to be covered by the survival kit were orientation in the political, social, and

³ What initially was called NOBS has become CCC, the acronym for Cross-Curricular Competencies.

economic world, problem solving capacity in everyday and critical key situations, communication skills, degree of autonomy (measured through self perception), and finally, perception of critical human values (e.g., prejudice versus tolerance, solidarity, etc.).

In 1993, a study was launched to investigate whether it was feasible to develop internationally comparable indicators of cross-curricular competencies using existing instruments and scales of satisfactory psychometric quality. As this was an untried idea at the time, it was not at all clear what the results of the study would be. The domains that were eventually retained – *Politics, Economics and Civics, Problem Solving, Self-Perception/Self-Concept, and Communication* – were rationalized by the availability of instruments. For political and technical/practical reasons the referential age for the target population was lowered to 16 years. The instruments were consequently adjusted to the target population available in the school system. Thus, whereas the original concept of the survival kit concerned young adults outside of school and a minimal level of competence, the CCC Feasibility Study focused on a school-based population and a wider range of difficulty levels.

The CCC Feasibility Study was undertaken between 1993 and 1996. Nine countries participated in the fieldwork. In a majority of the countries, the overall results were judged satisfactory for two out of four domains. Civics and Self-Concept met scientific standards, whereas Problem Solving and Communication needed further developmental work to meet the statistical standards. The results of the pilot study were published in the 1997 OECD publication *Prepared for Life* (OECD 1997a).

Considerable developmental efforts are still necessary for the planned integration of information on CCC into the ongoing PISA program, a large-scale study on educational achievement (see section on Ongoing Projects).

Discussion and Analysis

Selection

Since Network A is concerned with education outcome indicators, the general topic of competencies has been of interest to the Network

from the beginning and a feature of its activities. In the first phase of the work, the only large-scale achievement data available for calculating student achievement indicators were from the IAEP (conducted by ETS) and IEA studies, some as much as 10 years old. The availability of data became the dominant selection criterion for outcome indicators. Thus, in the early work of the network, the selection of an indicator set in the domain of competence was not based on a conceptual or theoretical framework.

Under the lead of United States, there was a quick development on the operational level for these first indicators. A main objective was the development of standards for generating indicators of educational achievement and the application of these standards to existing data in order to test their reliability and validity. The first indicators identified were related to major academic subjects taught in secondary school. A set of three provisional and experimental indicators related to competence in mathematics⁴ were published in the first edition of *Education at a Glance* in 1992.

This primarily subject-focused track within Network A, was criticized, and contested by several OECD members, especially representatives of European countries. It gave rise to a methodological, theoretical, and conceptual debate about outcome indicators and resulted in the creation of two sub-projects within Network A – the Project *Goal Attainment and Orientation in Education System* (GOALS) and the CCC project. Subsequently, they were integrated as major components in the strategic framework of Network A for student achievement outcome indicators.

In these sub-projects conceptual concerns were expressed, such as the difficulty of defining terms and the questions of what schools teach or are intended to teach. There was no consensus within Network A on the type of indicators to eventually include in the scope of the selected indicators. Both of the existing assessments, the international studies

⁴ Mathematics Achievement of 13-Year-Old Students (Data source: Second International Mathematics Study carried out by IEA between 1980 and 1982), School Differences in Mathematics and Student Differences in Mathematics (Data source: Data from the Second International Assessment of Educational Progress carried out by ETS in 1991).

by the IEA and the International Assessment of Educational Progress (IAEP), were considered to be too selective in their content and too restricted to traditional subjects. This led to the issue of how desirable and feasible it was to attempt to measure a broad range of areas not specifically related to particular subjects. There were also political concerns and interests involved, e.g., the benchmarking approach was contested by several countries, mainly for political reasons. Lastly, there was no consensus about whether the assessment was to be organized within the school framework, placing priority on results of schooling, or within a general context focusing on educational outcomes as a whole.

The GOALS project focused mainly on the question of how to take into account national specificities related to desired outcomes of learning. Since in some countries, student achievement indicators were not at the top level of educational goals, indicators only based on subject matter or on cognitive goals were considered misleading. Personality development, cooperation, orientation skills, and the effects of emotional education were judged just as crucial as cognitive goals. The GOALS group, composed primarily of Scandinavian countries, concentrated its work in particular on curricular objectives of education in schools, as expressed by official documents. Through this they also tried to capture general aspects of competencies, comparability was not a main goal.

The CCC project was another approach intended to define competencies in a more general, and not only curricular-bounded way. This project was aimed at a broader issue, trying to identify the needs coming from society and the economy to education. Although the concept of the survival kit found easy acceptance within Network A, agreement was limited to labeling. Due to methodological differences and a lack of resources and support, the decision was taken to begin work by testing the ideas empirically, applying only existing instruments, without first developing a general framework. The Feasibility Study was intended primarily to give evidence that the CCC approach could be realized in practice. The different conceptions regarding the definition of the concepts and the underlying theories and different normative assumptions have never been made explicit and clarified. Priority was given to empirical testing of the concepts.

Definition and Conceptualization

When Network A started its work, the notion of “competencies” was not used. The discussion about measuring outcome indicators in a broader sense was dominated by different concepts such as non-cognitive goals, goal-directed outcome indicators, non-curriculum bounded knowledge and skills, and cross-curricular competencies.

In the early work of the Network, the concept of *non-curricula bounded skills and knowledge (NOBS)* referred to competencies not included in the school curriculum. However, eventually there was a shift away from this concept and towards the concept of *cross-curricular competencies (CCC)*, referring to competencies that are included in multiple subject areas across the curriculum. This change in the focus of the network from one conceptualization (NOBS) to another (CCC) was accomplished without significant definition and clarification, reflecting a lack of theoretical reflection by the Network. In fact, recent trends in cognitive psychology suggest a scepticism about whether it is valid to think of competencies as spanning different content, proposing instead that cognitive competencies are always related to content.

No overarching theory in the CCC domain was developed. There are some traditions in the domain of outcomes of education that implicitly assume that competencies learned through school include those represented by the CCC concepts, such as longitudinal models of status attainment in sociology of education and the human capital approach in the economics of education. But it was generally agreed that although there was no general framework that included well-defined concepts from which indicators could be deduced logically, the work could proceed in a more inductive way. Developing a broader concept of competencies was not seen as crucial.

There are four general ideas that are relevant for the better understanding of the concept of *cross-curricular competencies*: the context of CCC, the notion of a survival kit, the conception of CCC as a preparation for future life, and, related, the learning approach inherent in that conceptualization. Each of these ideas influenced the development of the CCC project.

CCC Context

One crucial question for selecting and defining competencies is whether the relevant domain is restricted to formal education or encompasses both formal education and everyday life. It is widely recognized that the skills and competencies of young people are a result of schooling *and* a result of everyday life – a result of formal education *and* a result of informal education. Thus, not every outcome has been taught by the school; it might be a product of everyday life, even if it is a product of everyday life within the school. Some of the outcomes related to CCC are neither a part of the official curriculum nor formally taught, but relevant aspects for the individual learning process and the social capital of a society. Within the discussion of competencies, this broader understanding of education has an influence on selecting and defining competencies.

The inclusion of the whole learning context (not only the school but also everyday life situations) is a normative decision which influences the conceptualization of competencies: it leads to curricular bounded competencies as well as competencies not bound by the school curriculum. The main interest in the CCC project is, therefore, not school outcomes, but education outcomes.

Survival Kit

The underlying hypothesis in the CCC project was that it was possible to isolate a set of competencies common to all educational systems, and accepted as a common goal of compulsory school, because they were considered necessary for surviving. In the original conception, the indicator to be developed was supposed to measure not an optimal, but a minimal level of competence judged necessary for individuals to live an individually worthy and socially valuable life. The concept became known as the *survival kit*, including basic skills and fundamental knowledge: life skills. The term itself turned out to be ambiguous. For some members it was thought to pertain to the survival of individuals while others referred to a kit necessary for the survival of democratic societies, for the continuation of community in the sense of Durkheim. Depending on the interpretation, the conception of the survival kit varied.

The definition of the concept “survival kit” also depends on the border between school and other life spheres, on the border between cognitive and non-cognitive knowledge and skills, and finally, it depends if it is the outcome of formal school education or informal education. Representative concepts are, for instance, numeracy and literacy on the one hand, and democratic values, tolerance, and the capacity to cooperate on the other hand. These issues were not resolved within the CCC project group.

CCC as a Preparation for Life

The notion of preparing for life has become somewhat of a leading thread in the definition process of cross-curricular competence. To prepare younger generations for future demands is seen as the central challenge for society. It reflects the idea that schools or education systems are not ends in themselves, but means for making students competent for life, not just for school. In the CCC approach more general aspects of capabilities are emphasized, such as coping with life situations. Preparing for life is just as much acquiring the capabilities for reading novels and listening to music as it is acquiring the abilities to deal with the economic or professional world, to solve social problems, to build up social relations, etc. There is also a reference to the socialization process linking the micro to the macro level. The psychological disposition is seen as a product of history shaped partly through the family, partly through school, and partly through the conflict or cooperation between schools and other institutions.

Originally, the objective was to come to a definition in an inductive way by starting from factual, real life situations of young adults and by analyzing what they need to be able to cope with life. This inductive way was judged later as very interesting, but not successful at leading to a broad conceptual framework for life skills.

Learning Approach

Most of the already mentioned competencies are related to learning. It is well known that everything that the younger generation has to be prepared for in the future cannot be anticipated. Every generation has to handle unforeseen situations and life circumstances.

The ability to learn is seen as the best preparation for tackling future situations. This conception of competence assumes high quality learning. High quality learning is a concept associated with psychological notions such as learning strategies and learning habits. The concept of high quality learning comprises competencies (knowledge and skills) and motivation (beliefs, attitudes, values, habits, emotions, and all those psychological constructs which regulate learning). This is a key element for understanding the CCC approach. The Self-Concept domain, which was included in the CCC Feasibility Study, is only a small component of an elaborate concept of learning competence. The domain of learning competence is thought to be extended through indicators of “mental health”, based on psychological and health research, and through indicators of “youth behavior”, based on the sociological monitoring of youth.

Empirical Considerations

For certain areas of CCC, the theoretical link between concepts and scientific psychometrics can be done by referring to cognitive psychology. For example, motivation and coping strategies are rather clearly defined scientific concepts. There is also a longstanding research tradition on self-concept, self-esteem, and self-efficacy as well as on problem solving.

Many other concepts of competencies in the CCC domain are, however, related to belief in ability to cope or motivation to achieve, concepts which have never been assessed in an international context. There is, therefore, very little experience on which to build.

Since the CCC approach has been mainly empirically inductive, there is no general theoretical framework that could provide definitions to serve as a conceptual or theoretical reference for the development of measurement instruments and the interpretation of results. This is, however, even more indispensable for complex indicators since they make sense only when they are related to a theoretical framework. The development of an overriding theory and the construction of adequate instruments are key to progress in the competence related domain. However, this is possible only with considerable investment of resources: core-brainwork, involvement of highly qualified and experienced researchers in specific scientific fields, and substantial financial resources.

The CCC project succeeded in the sense that it demonstrated with the Feasibility Study that the CCC approach was thinkable and doable, and it convinced the OECD countries that the ideas behind the CCC project were interesting and relevant for the assessment of learning outcomes. In addition, two of the scales in the CCC Feasibility Study contributed to the development of later surveys. Work is proceeding to integrate measures building on the self-concept scale into PISA, and the experience gained from the civics scale is being used in the IEA Civic Education Study (see Ongoing Projects).

International Adult Literacy Survey (IALS)

Description

The basic goal of the International Adult Literacy Survey (IALS) was to assess the literacy performance among people from different countries using measures specifically developed for cross-national comparisons. The first phase of the survey was conducted in 1994 in eight countries and resulted in the 1995 OECD/Statistics Canada publication *Literacy, Economy and Society*. The second phase of the survey was conducted in four additional countries in 1995 and was used, along with data from the first phase, to produce the 1997 OECD/Human Resources Canada publication *Literacy Skills for the Knowledge Society*. A third phase is currently collecting data in 12 countries.

To collect the data for the study, all participating countries administered a household survey to a probability sample of adults aged 16 to 65. Some countries included older adults also. The survey consisted of a background questionnaire and booklets with literacy assessment items. Background questions covered socioeconomic status, educational attainment, literacy practices at work and at home, labor force status, adult education participation, and literacy self-assessment. The literacy items were based on materials from both North American and European sources and were designed to assess skills in three areas:

Prose literacy – the knowledge and skills needed to understand and use information from texts including editorials, news stories, poems, and fiction;

Document literacy – the knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables, and graphics; and

Quantitative literacy – the knowledge and skills required to apply arithmetic operations, either alone or sequentially, to numbers embedded in printed materials, such as balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest on a loan from an advertisement (OECD and Statistics Canada 1995: 14).

Literacy scores for countries and subgroups were estimated using item response theory (see Empirical Considerations below). In addition to scores ranging from 0 to 500, the survey methodology allowed performance to be characterized according to five levels, which range from very basic skills to those that require high levels of inference and complex reasoning.

Literacy Skills for a Knowledge Society is based primarily on the IALS data collected in 12 countries. The report includes information about distributions of literacy levels for different areas and within those areas, for people with different background characteristics, e.g., age, education, and gender; the economic benefits to individuals of literacy skills relative to the benefits of educational attainment and labor force experience; the relationship between literacy and characteristics such as age (net of education) and parent education; literacy practices of adults; and participation in adult education and training.

Discussion and Analysis

Selection

Unlike the CCC project which conducted an exploratory study in new domains for national-level assessment, the IALS grew out of major assessments of literacy conducted in two countries: Canada's 1989 Survey of Literacy Skills Used in Daily Activities and the United States' 1990 National Adult Literacy Survey (NALS). The conceptualization and methodology for measuring literacy had been developed in the United States and used for the NALS. In addition, the Canadian survey had already successfully demonstrated that a literacy survey could be successfully implemented in two languages. From that point, the extension of these surveys into the international arena reflected a confluence of interest among a number of key actors.

Reasons for interest in conducting an international assessment of adult literacy varied from personal to political to scientific, depending on the participating nation or the individual involved. For some, the primary motivation was to investigate whether the NALS strategy for assessing literacy was feasible across languages and cultures, with new items developed to reflect the range of reading material in different countries. The inclusion of a background questionnaire was also a key factor and generated interest among researchers and policymakers.

The background questionnaire allowed IALS to provide, for the first time, cross-national data on adult education and training and the relation of literacy skills to labor market outcomes, such as employment earnings for workers in different occupations and industries.

IALS was also attractive because it provided an opportunity to move the assessment agenda beyond schools and schooling and beyond standard assessments of curricular-based skills. Its content represents activities from everyday life and is not organized around school subjects. Furthermore, IALS included the entire population, not just those in schools. This was particularly important for those interested in the skills of the young population; previous measures of this group were limited to those in school.

Political support was generated because of the existing scientific base for the study and the potential policy-relevance of the findings in the context of issues such as unemployment and national competitiveness in the global economy. The pre-existence of a measurement instrument along with an established theoretical and conceptual framework (discussed below) created a notion of ease-of-implementation for IALS that encouraged participation among countries. Although it was not the driving force behind the study, political motivation in some quarters came from a more basic interest in utilizing IALS simply to compare literacy skills across the countries, what has been called “the horse race.” And for some, interest in literacy *per se* was secondary to the desire for any comparable data on skills of the adult population, particularly young adults out of school.

Funding for the study, which came primarily from Canada, but also from each of the participating countries, involved recognition on the part of funding agencies that in spite of much rhetoric about the relationship between worker skills and economic outcomes, there was scant empirical evidence to support the claims. IALS was an opportunity to obtain this data and in the process advance other interests as well. IALS was initiated by the OECD and Statistics Canada, independently of Network A and the CCC project.

Definition and Conceptualization

The definition of literacy adopted by IALS is “the ability to understand and employ printed information in daily activities at home, at

work and in the community – to achieve one’s goals, and to develop one’s knowledge and potential” (OECD and Human Resources Canada 1997: 14). Its theoretical foundation comes from the work of Irwin Kirsch and Peter Mosenthal, which began in the early 1980s with the development of the Young Adult Literacy Survey in the United States (Kirsch and Jungeblut 1986), and was refined for subsequent studies including the NALS (U.S. Department of Education 1993). The idea that literacy involves understanding any printed or written information, not just prose which is typically associated with school reading, is key to the definition of literacy embodied in their work. In the IALS conceptualization, literacy involves the ability to complete tasks based on documents encountered in daily life, including those involving arithmetic operations encountered in everyday life, when presented in written form, as well as comprehension of prose selections. According to the view of literacy used in NALS and IALS, literacy can be subdivided into three domains: prose literacy, document literacy, and quantitative literacy depending on the type of printed information.

Further, literacy is conceptualized as a continuum ranging from the most basic decoding skills to understanding complex ideas presented in written form. This idea differs fundamentally from the concept traditionally associated with literacy, in which it is seen as a dichotomous capacity that individuals either have or do not have. Kirsch and Mosenthal’s theory of adult reading links reading difficulty to attributes of the text and the tasks the reader must perform. Difficulty is a function of task characteristics, such as how explicit is the relationship between what the respondent is asked to do and the presentation of the information in the text; whether information appears in the text that is similar to, but is not, the correct answer; whether the information is concrete or abstract; and the structural complexity of the item. For quantitative literacy, it is also a function of the difficulty of setting up the problem and the type of calculation involved. In addition, difficulty depends on characteristics of the materials presented, such as length of words and sentences, clarity of document labels, complexity of documents, and the amount of information presented in the item.

An extension of the notion of literacy used in IALS is the idea that individuals’ literacy skills are not synonymous with their education and training qualifications; individuals may have identical qualifications and yet have different literacy skills.

Empirical Considerations

Empirical considerations were central to the development of the measures of literacy used for NALS and, subsequently, for IALS. IALS represents the fourth study using the literacy theory and methodology that was first developed for the Young Adult Literacy Survey in the United States, administered in 1985. (The second was a study conducted for the U.S. Department of Labor (U.S. Department of Labor 1992), and the third was NALS.) Each stage provided an opportunity to examine the theory in the context of empirical information about the literacy performance of individuals. For example, the theory of how characteristics of written material relate to reading difficulty was developed empirically by relating the task difficulty to a set of characteristics for each task. Regression analyses of the contribution of different characteristics to predicting performance on the item were used to explore which characteristics contribute most heavily to difficulty, and to describe literacy activities in terms of particular task characteristics. Initial notions of difficulty have been refined based on the empirical relationships between characteristics of reading material and performance of readers.

At the beginning of the development of IALS, it was recognized that there could be differences in the extent to which the items have similar characteristics and measure the same ability across countries, language groups, and cultural communities. In fact, one of the motivations for conducting the study was to investigate whether the methodology would be workable on an international scale. Analyses conducted using the data collected for the study found, with the exception of a few items which were dropped from the study, that the items showed similar patterns in relating to literacy proficiency of adults.⁵

⁵ IALS used the methodology of item response theory (IRT) to develop its three literacy scales. These methods allow test developers to estimate the difficulty of individual items and then to estimate latent traits or abilities based on performance on the items or an item subset. There were only 12 (out of 114) items for which data for more than three countries showed a poor fit to item parameters common to other countries. These items were dropped from the analyses. In cases where data from one to three countries did not fit the common parameters, unique item parameters were estimated for the differing countries. In some cases, there were obvious explanations for the poor fit; in others no reasons could be identified (U.S. Department of Education 1998).

IALS was specifically designed to allow empirical tests of theories about the relationship between literacy skills and educational attainment and qualifications, and the relationship between literacy skills and earnings – independent of educational attainment. Previously, educational attainment was the only measure available and had served as a proxy for actual skills in research relating worker characteristics to labor market outcomes. These analyses were key to the interest of policymakers in the study.

In addition, IALS provided an opportunity to further refine the theories developed for NALS. The data were used to investigate the extent to which the constructs of prose, document, and quantitative literacy represent distinct dimensions in IALS countries, as proposed by the theory guiding the work. The analyses found high correlations among the three scales, but concluded that there was “sufficient separation among the three literacy scales to justify reporting these scales separately” (U.S. Department of Education 1998: 143).

When the results of the first round of IALS were reported to participating countries, the extent to which the survey actually attained international comparability was questioned by the French authorities. Their concerns included the appropriateness of the assessment instruments, the validity of the sampling procedures, and the reliability of the population estimates (U.S. Department of Education 1998)⁶. In response, Statistics Canada commissioned a review of the survey procedures by three statisticians. Their review, which has been published in the IALS technical report, pointed out a number of problems mainly related to the survey design and procedures (U.S. Department of Education 1998).

The review concluded that there is a serious need for more standardized procedures in future surveys, but that despite the methodological weaknesses, the survey results could be published. The authors stated that all results should be interpreted with caution, and recommended that the reported results focus on analyses of the correlates of literacy and how these compare across countries rather than on overall literacy levels. (Their position is that the former type of analysis is less

⁶ France had been an early participant in IALS and its representatives participated throughout the development of the survey.

likely to be affected by survey weaknesses than the latter.) At the same time that it suggests that results of the first round of IALS should be accompanied with cautions about interpretation, the report views the instruments developed for IALS as an “important advance” and the results of the first round assessments as “a valuable contribution to this field” (U.S. Department of Education 1998: A4).

France, however, confronted with very weak results in comparison with other countries, continued to question the comparability of the results and decided to withdraw its results from the IALS publications. Consequently, two expert reports were initiated by the French Ministry of Education to examine methodological questions related to international surveys in the domain of literacy⁷.

⁷ Blum, Alain and Guérin-Pace, France. 1997. *De la difficulté d'entreprendre une enquête internationale sur l'illétrisme*, Institut National d'études démographiques (INED).

Dickes, Paul and Flieller, André. 1997. *Analyses secondaires des données françaises de la première Enquête Internationale sur l'Alphabétisation des Adultes (enquête IALS)*, Université Nancy 2, Laboratoire de Psychologie.

Human Capital Indicators Project

Description

In 1996, the OECD Council of Ministers requested that OECD prepare a report on what is known about human capital. The report was to develop indicators based on existing data, identify gaps in internationally comparable data, and discuss the costs of the development of data collections for new measures of human capital. The request resulted in the 1998 OECD publication *Human Capital Investment: An International Comparison*.

Unlike the other projects discussed in this paper, the Human Capital Indicators Project was for the most part an internal OECD effort, relying on OECD staff and consultants. Its work built on the activities conducted by the INES project working group on measures of education and labor market destinations (Network B), but the project did not involve participation by country representatives or national study managers.

Human Capital Investment: An International Comparison recognizes that the concept of human capital has been used in a number of different ways since its modern usage was initiated by economists in the sixties (Schultz 1961 and Becker 1964), and adopts a definition of human capital as “the knowledge, skills, competences, and other attributes embodied in individuals that are relevant to economic activity” (OECD 1998: 3). The report recognizes that social benefits of individual attributes extend beyond economic activity, but restricts human capital to “assets with the capacity to enhance or support productivity, innovation, and employability (OECD 1998: 3).

The first topic addressed by the report concerns the stock of human capital, “the level of skills, knowledge, and competencies held at any one time by individuals” (OECD 1998: 15). Data from IALS provide the only direct measure of adult skills available for different ages. Qualifications and years of schooling are also available for people of different ages, and analyzing educational attainment of different age groups gives indications of changes in patterns across time. The value of human capital is indirectly measured by using wage data and earning differentials between those with different education and/or skills.

Issues of investment and return on investment have become key policy topics within the OECD context. *Human Capital Investment* contains chapters on these topics, with measures of investment based on expenditures and participation in education and on training. Economic returns to human capital investments are expressed in terms of employment and earnings.

Human Capital Investment concludes with chapters discussing the adequacy of the knowledge base and policy issues in human capital investment. It recognizes that most available measures have focused on what is possible rather than what is desirable to measure and recommends that priority be placed on “more direct measures of life-relevant skills, of the value placed on them in the workplace and of the benefits to individuals and enterprises of work-related training” (OECD 1998: 89). Improved measures of human capital will allow for more rigorous analysis of issues such as levels of investment, sharing of costs between governments and the private sector, allocating expenses to areas where they will be most beneficial, and distributing investment equitably among the adult workforce.

Discussion and Analysis

Selection

Recent OECD work in the area of human capital had its beginnings in the mid-1990's when labor ministries from the United States and Canada expressed interest in revising official accounting methodologies to recognize expenditures for training and labor force development as investments. According to their view, these expenditures represent investment in human capital; not including them as investments in business and national accounting could result in decisions about the allocation of public and private resources that don't maximize economic development. To accomplish a re-design of this magnitude would have required significant political and financial support, and the effort was never undertaken. However, the 1996 Council of Ministers recognized this general concern when it requested that OECD prepare a report presenting indicators of human capital for the ministerial meeting in 1998.

The Council of Ministers' request for a report on indicators of human capital naturally reflects interests broader than the initial inquiries from the United States and Canada about accounting systems. In part, it can be seen as developing from the OECD Jobs Study (OECD 1994). The study concluded that adaptability – including individual adaptability – is a key dimension for economic stability and growth, an idea that has clear ramifications for education throughout the lifespan. Further, the concept of employability, as distinct from educational attainment and training, has gained increased acceptance by policymakers. In sum, the request for the human capital report reflected a growing recognition in the spheres of labor and finance ministries that issues related to the development of individual capabilities – human capital – are relevant for economic policy.

Indeed, one of the primary accomplishments of *Human Capital Investment* was providing the education arena with quantitative and qualitative analysis that relates human capital to issues of interest in macroeconomics and labor economics. This in turn gives added weight to education policy vis-à-vis other policy areas, such as finance and labor. In fact, it appears that support for continuing the work begun in the Human Capital Indicators Project was stronger in labor than in education within OECD.

Definition and Conceptualization

The Human Capital Indicators Project provided an opportunity to clarify the conceptualization of “human capital” for the OECD context, including the meaning of the term itself and its position in a wider theoretical framework. A large number of theoretical and conceptual issues needed to be considered before arriving at the concise definition presented in *Human Capital Investment* and quoted above.

While the final definition is quite brief, many interrelationships among different social and individual characteristics are recognized in the report. Although there is only brief mention of them, they include:

- The relationship between education and training on the one hand, and “knowledge, skills, competencies, and other attributes” on the other;

- The role of a range of life experiences in developing human capital;
- The wide range of individual characteristics that contribute to human capital;
- The related concept of social capital; and
- The extent to which non-economic sectors (e.g., social cohesion, health) contribute to the economic sector both at the individual and society-wide levels.

The conceptualization proposed in *Human Capital Investment* challenges analysts and policymakers to address issues that have traditionally fallen outside of the domain of human capital. Whereas previous analyses have focused on topics associated with classical economic theory, such as investment in and rates of return to formal education and training, the report highlights other aspects of human capital. The first is the notion that attributes of individuals extend beyond academic knowledge, encompassing both cross-curricular skills and attitudes. Second is the idea that human capital is acquired by individuals not only before they enter the workforce but throughout their lives. Third, human capital is not acquired exclusively through the formal initial education and training systems, but in a range of environments including work, work-based training, working life, and informal experiences. Lastly, human capital is relevant for individuals and society in non-economic arenas as well as in economic ones.

It is important to note that representatives of different intellectual and policy areas participated in the discussions leading up to the report, and covered each of the related issues. By the time the final definition was agreed upon, they had gained a clearer understanding of each other's perspectives and of the trade-offs inherent in the final definition.

At the same time that the report confirms a broad view of human capital, many related questions are beyond its scope. Of key interest to the DeSeCo project is the issue of what are the knowledge, skills, competencies, and attributes that constitute human capital. While affirming that human capital is important for individual and aggregate economic productivity and further, that traditional curricular subject areas are inadequate to delineate characteristics that constitute human capi-

tal, the project leaves the topic of specifying the knowledge, skills, competencies, and attributes of human capital to future investigators. The report also recognizes that further conceptual and theoretical development is necessary to take into account the interrelationships among human capital, the economy, and non-economic sectors such as health, and the impact of human capital investments on non-economic sectors.

Empirical Considerations

Human Capital Investment takes a strong stand that most existing measures of human capital do not capture its full meaning. For example, traditional indicators based on the formal education system (enrollment, attainment, and costs) do not directly measure the capabilities of individuals. Nor do they reflect experiences in the range of environments outside of the formal education systems that contribute to accumulation of human capital in individuals. Indicators based on investments and wage differentials are even more indirect, and are based on larger assumptions.

The report recommends that priority be given to developing direct measures of a range of individual attributes, with a viewpoint that these attributes are developed through institutions and experiences beyond primary, secondary, and tertiary education. In light of the fact that previous empirical investigations of human capital theory have relied on more indirect measures with little recognition of their limitations, this understanding represents a new outlook in the empirical analyses of human capital.

In spite of the recognized limitations of existing measures, the report devotes the majority of its attention to presenting indicators based on them. Work is continuing in the Centre for Educational Research and Innovation at OECD on analysis of the relationship between human capital and economic growth and social cohesion. Within this continuing work, there is a focus on better conceptualisation of human capital in relation to other forms of capital such as social capital as well as on evidence for broad social and macro-economic returns to investment in skills and knowledge.

Ongoing Projects

International Life Skills Survey (ILSS)

Building on the International Adult Literacy Survey (IALS), there is presently an attempt underway to develop and conduct a new survey to comparatively assess a range of life skills across the adult populations of several OECD nations. The goal of this survey, the International Life Skills Survey (ILSS), is to build on the IALS with a broader assessment, resulting in a more complete picture of individual life skills in the international context. ILSS will assess several domains, including prose literacy and document literacy (utilizing the same framework as IALS), numeracy, problem solving, teamwork, practical cognition, and computer familiarity. These skill areas will be assessed through direct performance or through behavioral reports. A questionnaire to obtain participant background information will be included as well. Currently, survey planners are working towards conducting item feasibility studies for the domains in 1999, a full pilot survey in 2001, and the main survey in 2002.

This survey is patterned on IALS in multiple respects, and generally seeks to take the lessons learned and procedures developed by IALS and apply them to the larger framework of ILSS. The current group of skills included in the ILSS plans was developed by considering skills commonly mentioned in policy reports on employability along with recommendations from experts in the field of international competence assessment.

<http://www.nces.ed.gov/ilss>

Program for International Student Assessment (PISA)

Between 1995 and 1997, the INES Network A group developed a Data Strategy aimed "at the assessment of broadly defined knowledge, skills, and competencies embedded in the context of important content domains rather than the assessment of very narrowly defined subject matter knowledge" (OECD 1997b: 44-45). The Program for International Student Assessment (PISA) is a manifestation of this strategy designed to obtain indicators of student knowledge, skill, and compe-

tency on a regular basis in the domains of reading, mathematics, and science. The data collected will be presented as outcome indicators providing information in four key areas: student achievement, relations between achievement and contextual variables, school effectiveness, and trend data.

PISA is scheduled to operate on a three-year cycle. Each iteration will include all three domains, but focus on one. The first iteration of the assessment is planned for 2000, focusing on reading. Additionally, depending on the progress of current developmental work, CCC domains such as Self-Concept and Problem Solving may be incorporated into the assessment (Self-Concept in 2000 and Problem Solving in 2003 (see below)).

The domains of reading, mathematics, and science were selected because of the interest of policymakers, pre-existing measurement technology, established conceptual and empirical frameworks, and a history of successful international assessments in the skill areas. In particular, PISA is building on the base developed for two recent IEA studies: the Reading Literacy Study and the Third International Mathematics and Science Study (TIMSS).⁸

PISA is the result of a concerted effort on the part of survey planners to move from an ad hoc basis to a cycle of regular data collection. The development of PISA has involved multiple compromises, notably on the age of the sample (15-year-olds), and reflects a commitment by all participants to share the costs of the international assessment.

Although the Data Strategy that resulted in PISA was originally developed within Network A, the effort has become independent of the Network. The Board of Participating Countries (BPC), with a representative from each country in the survey, is responsible for overall policy direction. PISA is managed by OECD through a consortium consisting of The Australian Council for Educational Research (ACER), The Nether-

⁸ Prior to TIMSS, IEA also conducted two mathematics and two science international assessments (see Footnote 1).

lands National Institute for Educational Measurement (CITO), Westat Inc., and the Service de Pédagogie Expérimentale, Université de Liège (SPE).

<http://www.pisa.oecd.org>

CCC Problem Solving Project

Presently the INES Network A, as part of its overarching Data Strategy, and as a continuation of its CCC work, is planning an assessment in the domain of problem solving. A six-year plan for devising and administering an assessment in the competency by 2003, as a part of PISA, was presented to the Network in the spring of 1998. The first step is the definition and exploration of the problem solving domain itself. After this is complete, the next steps will involve establishing criteria for developing and/or selecting reliable and valid instruments for measuring problem solving. Once an instrument has been developed it will undergo field testing before final survey implementation. The selection of problem solving is directly related to the earlier CCC activities of Network A, and this plan can be seen as an extension of that research.

IEA Civic Education Study

The IEA (see Footnote 1) is currently conducting an international Civic Education Study. The survey will assess the competency of 14-year-olds with respect to civic and political knowledge based on items derived from expert panels in participating nations. The study is based on a conceptual framework of civic knowledge developed specifically for the assessment. Although unrelated to OECD and INES, this project is mentioned because it is building on the experience of the CCC Feasibility Study.

Third International Mathematics and Science Study (TIMSS and TIMSS-R)

Another IEA effort that is significant for work on competencies in the OECD context is the Third International Mathematics and Science Study (TIMSS). Building on earlier IEA studies of mathematics and sci-

ence, TIMSS assessed mathematics and science knowledge and skills of over a half-million students in 41 countries. Students at three different levels of schools were tested: midway through elementary school, midway through lower secondary school, and at the end of upper secondary school. (Assessing the second population was required for participating countries; the others were optional.) In addition to the assessments, the study included school, teacher, and student questionnaires and a curriculum analysis. All aspects of the study design and instrumentation were developed through international collaboration.

Currently, 40 countries are participating in a replication of TIMSS (TIMSS-R) at the lower secondary level. This will make it possible to analyze time trends during the 1990s for lower secondary students and to conduct analyses of the performance of the cohort of students originally tested midway through elementary school five years later, when they are in lower secondary school.

Conclusions

Growing demand from national authorities for output-oriented information about education has resulted in a number of projects in the OECD context. Although their goals are related, these projects have operated more or less independently, with minimal conceptual and organizational coordination related to selecting and defining competencies. Nevertheless, the three major efforts profiled in this report – the CCC project and its Feasibility Study, IALS, and the Human Capital Indicators Project – have a number of elements in common.

Each of the studies adopted a broad conception of competencies and outcomes of education. This includes the viewpoint that the desired outcomes of education are broader than the acquisition of subject-related knowledge typically taught in school, and that the idea of competencies extends beyond the school context. The areas covered in the CCC Feasibility Study stretch across curricular boundaries and are viewed as skills for life. The IALS conceptualization of literacy includes performing tasks based on a wide range of printed materials, and views literacy as spanning the range from basic to advanced levels. The conceptualization of human capital presented in the HCI report recognizes that it is comprised of components acquired both in and out of school that contribute to economic productivity of individuals, and is conceptually distinct from attainment in formal education.

Feasibility of measurement was a major concern in the selection and definition of competencies in each of these projects. Although not always the goal at the onset, each of the projects eventually gave priority to empirical testing of concepts by applying existing methodologies, instruments, and, when possible, existing data. Competencies for the CCC Feasibility Study were selected on the basis of whether existing instruments of sufficient quality were available; the goal of the project was to show that these instruments could produce interesting and useful measures. In the case of IALS, the availability of a measure was key to the selection of literacy for the first major international survey of an adult competency and to the use of the conceptualization of literacy from the National Adult Literacy Survey in the United States. For the HCI project, the request by the OECD Ministerial Council was to develop indicators based on existing data.

As a result, theoretical and conceptual issues were not at the forefront of these projects. In CCC, the reliance on existing instruments came at the expense of conceptualization of competencies, their relationships to the school curriculum, and their interrelationships to each other. There is almost no discussion in *Prepared for Life* of conceptual issues related to the term “cross-curricular competencies” or to the specific competencies being assessed. The key initial question of the CCC project – which knowledge and skills and attitudes are important for surviving and leading a productive, socially worthy life – was set aside as the goal of the project changed. The conceptualization and measurement used in IALS is built on a theoretical base. However, as much of this work has taken place over many years, it was not the focus of the IALS project. Further, IALS was developed in a national context for other projects (most directly, the United States National Adult Literacy Survey), and thus its conceptualization of literacy is not the product of an internationally collaborative process. Although the HCI project developed a distinctive conceptualization of human capital, the focus on the work was on using existing data for indicators, rather than on refining the conceptualization or exploring its theoretical ramifications.

Another result of the focus on measurement of individual competencies is that the studies are not concerned with how competencies are interrelated. The concept of human capital presented in the report is not concerned with its components, in particular what knowledge, skills, competencies, and other attributes result in human capital; and how they are related to each other. Likewise, the CCC Feasibility Study did not deal with how the four skill areas are interrelated or with how cross-curricular skills relate to curricular skills. IALS and previous studies based on the literacy framework are not concerned with how literacy skills relate to, or are interconnected with, other knowledge, skills, and attributes, or how literacy fits into a larger framework of competencies.

Each of these commonalties among the studies can be seen as following from the fact that the overriding priority for work in the OECD context is providing information to the policy community. Taken together, the studies succeeded not only in providing a great deal of such information, but also in generating both interest in competencies beyond the field of education and support for efforts that are currently underway. However, because limited resources were available on the

international level for conceptual and theoretical work, the studies were obliged to draw from the existing scientific base. Close cooperation with the scientific community in future efforts to define, conceptualize, and measure competencies is crucial to the success of this work.

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Annex A: The INES Networks

The Centre for Educational Research and Innovation of OECD initiated the International Education Indicators Project (INES) in response to increased demand from member countries for improved comparative information about the quality of education systems. The project grew out of two preparatory conferences, an initial meeting in the United States in 1987, and a planning conference in France in 1988.

In 1988, five Networks were set up, one in each of the following areas: student flows, student outcomes, ecology of schools, finance, and attitudes and expectations. Funding for these Networks was provided by Australia, Austria, France, the Netherlands, and the United States.

The Networks were restructured in 1991. The Networks on student flows and finance were merged into a single Technical Group working directly with the OECD Secretariat. Four Networks were formed: student achievement outcomes (Network A), labour market destinations (Network B), school processes (Network C), and attitudes and expectations (Network D). These Networks were supported by the Netherlands, Scotland, Sweden, and the United States. At that time, a decision was made to begin publication of *Education at a Glance*. The first volume was published in 1992. General Assemblies of all participants in the work have been held in 1989, 1991, and 1995.

The Networks meet about twice a year for the purpose of working collaboratively toward the common goal of conceptualizing and producing innovative education indicators. In between meetings, the groups comment on proposals that are circulated in preparation for the meetings; Network sub-groups are assigned to specific tasks. Administrative and scientific guidance is provided to the Networks by the OECD Secretariat (Hirsch, 1995).

Annexe B: Interview Protocol

The interviews conducted for the purposes of this paper took place between March and June 1998. The interviews were conducted in both Switzerland and the United States, depending on the participants' schedules. An in-person interview was conducted in all cases but one, where a phone interview was conducted instead. The interviews were recorded, transcribed, and shared among the authors. The following questionnaire was distributed to participants in advance of the interview and was generally used as a guide for the entire interview.

Questionnaire for the Interview

In general, please provide answers only for projects that you have been personally involved with.

1. What has been your role in OECD projects related to conceptualizing or measuring competence? Have you worked in other projects related to these topics?
2. In your view, what factors contributed to the selection of the particular areas of competence associated with the project(s)? This may include the sources of interest (educators, political groups, experts, the scientific community, particular countries), feasibility of measurement, availability of funding, and related events and conditions.
3. For the sources of interest that you have identified, what were the reasons for their interest? What did they want the study to provide?
4. How does the area(s) of competence as conceptualized or defined by the projects(s) fit into a theoretical and scientific context? What theories have guided the conceptualization? Can it be identified with a particular scientific context and with particular theorists and proponents?

5. How was the conceptualization of the area(s) of competence operationalized into a measurement strategy (instrument, procedures, etc.)? What theoretical considerations were involved?
6. What conceptual or theoretical frameworks were used to analyze the empirical results? What is their scientific context?
7. How did the original ideas in the project(s) evolve as the project progressed? What factors are associated with these changes (e.g., practical, scientific, political)?
8. What do you view as the accomplishments of the projects? What are the benefits and challenges associated with what has been learned?
9. What do you see as next steps in the area of defining, selecting, and measuring competencies within the OECD context?

In response to a growing demand from national authorities for output-oriented information about schools, several initiatives in the OECD context have worked towards conceptualizing and developing new measures of learning outcomes for students and the general population. This report focuses on three such projects, the Cross-Curricular Competencies Project, the International Adult Literary Survey, and the Human Capital Indicators Project. These activities are examined at the theoretical and conceptual level by analyzing the processes associated with the selection, definition and conceptualization of competencies, and the empirical considerations applied.

This report is the initial activity of the OECD program *Definition and Selection of Competencies: Theoretical and Conceptual Foundations (DeSeCo)*. Initiated in 1998, DeSeCo is a three-year program that seeks to develop, through international and interdisciplinary collaboration, a framework for understanding the competencies that an individual needs to lead a personally and socially successful life and for a democratic society to face the challenges of the present and the future.