

INDICATORS ON HUMAN CAPITAL INVESTMENT: A FEASIBILITY STUDY

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Paris 1996

42559

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INDICATORS ON HUMAN CAPITAL INVESTMENT: A FEASIBILITY STUDY

Introduction

There are at least three concerns underlying the request which Ministers gave to the OECD. The first relates to the growing recognition of the importance of the quality of human resources to competitive success of nations and regions in the global economy and the reduction of social inequality. Second, policy-makers are increasingly concerned about the returns to different forms of public expenditure in the context of the need in many Member countries to reduce public sector deficits and enhance the effectiveness of public expenditure. Finally, there is a need to provide better information on human capital formation in the context of changes in the location of learning and in the knowledge needs of enterprises and society.

Subsequent to the request, the OECD Secretariat has examined some of the available data sources and analyses in relation to international indicators of human capital investment, as well as the areas in which improvements need to be made or new sources of data created. The consensus view of national delegates and invited experts at a meeting held at OECD in January 1996 was that a significant effort by the OECD was required to develop comparable indicators to guide the policy debate.

The OECD Secretariat proposes that this work should be undertaken according to two main objectives during an initial period of eighteen months. The first objective should be to produce from existing data sources an initial set of indicators of human capital investment and its impacts, together with an analysis of the comparability and usefulness of these indicators for policy purposes. The second objective should be to examine those areas of human capital investment and its impacts where there is a need for new indicators and to propose a significant development in the key areas of skill measurement and lifelong learning, including enterprise-based training.

In establishing any set of indicators, it is necessary to begin from a definition of human capital. Human capital can conceivably encompass many attributes of individuals and institutions -- physical, biological, psychological, cultural and organisational learning. The stock of human capital is affected by learning or acquired skills either through the formal education and training systems or outside them. It is also related to social factors including the level of health, nutrition, social support structures and innate ability. However, for the purposes of this proposed work, it is suggested that only those aspects of human capital investment and outcomes which relate to learning in the formal education and training systems (including informal enterprise-based training) should be considered for indicator development.

First Objective

The primary challenge in the first objective is to bring together existing data and measures of human capital investment and its impact. Any set of indicators must include measures of investment in human capital such as public and private expenditure for education and training, as well as measures of the incidence and volume of time spent in training by individuals. However, these measures reflect only the

input to the formation of human capital. It is necessary to use measures of outcomes from education and training, and to relate these outcomes to investment through, for example, rates of return to investment. Using existing data sources, it should be possible as a first objective to develop measures in three broad domains: (1) investment in human capital; (2) the stock of human capital; and (3) the impact of human capital formation on economic performance. In the first domain, it is necessary to take account of the expenditure for education and training from public and private sources (including enterprises), as well as the input of time to training and education as measured by the rate and duration of participation. In the second domain, various measures of skills are needed, or in the absence of direct skill measures, various proxies such as completed education levels or years of schooling. Finally, under the heading of the impact of human capital formation, would come measures of the rate of return to investment as well as more crude measures of labour market outcomes such as earnings and employment status. Indicators produced for each of these three domains need to be critically examined from the point of view of international comparability and feasibility of use in policy analyses.

Some proposed indicators according to the first objective are outlined as follows and summarised in Table 1 below:

First domain -- investment in human capital formation

The cost of providing education and training

There is already an abundant supply of data on public and private efforts in the provision of education and training, especially in relation to public sources of funding. In *Education at a Glance* (OECD, 1995a), data have been published on expenditure for education according to public and private service providers (i.e., public schools and private schools), and according to public and private sources (mainly household sources). Published estimates of cost per student per annum may be obtained from *Education at a Glance* (EAG). It should be possible to use these published estimates in conjunction with information on length of courses to arrive at an estimate of expenditure per graduate at Upper Secondary and Tertiary levels.

Data on investment in enterprise-based training are available from a number of national training surveys as well as from establishment administrative records in a number of countries. The data which have been published in *Employment Outlook, [EmO]* (OECD, 1991) should be updated. However, a lack of comparability in many of the results arising out of different definitions, coverage and reference periods in relation to enterprise-based training constitutes a major challenge in this area.

Measures of participation in education and training

Through the INES education indicators project of the OECD, and the resulting publication of three editions of *EAG*, indicators are available on participation in both the formal education system as well as continuing job-related education and training in the adult population. Data on the incidence of on-the-job training in enterprises are provided in *EmO*. Some examples of existing data are provided in Tables 2 and 3 in the annex. However, it should be noted that there are serious comparability problems with some of the data in these tables. It would also be possible to use the results of data collection currently being undertaken by the INES project to construct an indicator of training for the young unemployed. Data are already published in the Statistical Annex of *Employment Outlook* on various types of active labour market interventions, including measures for the young unemployed relating to participant inflow as well as expenditure. However, measures of the rate or duration of participation in education or training are

proxies for human capital formation and take no account of the quality or effectiveness of training programmes in developing human skills.

Second domain -- measuring the stock of human capital

Measures of educational attainment in the adult population

Measures of educational attainment in the adult population are one of the most common proxies for human capital stock. However, they remain essentially input measures and are proxy measures only for impact of education in terms of human skill formation. A distribution of the adult population according to the highest completed level of education has been published in *EAG*. The highest completed level of individuals is defined with respect to the **International Standard Classification of Education (ISCED)** as applied to national educational programmes. As an extension of this approach, it may be possible to develop an index of the average number of years of schooling in the adult population based on completed education and an estimated average cumulative duration of education to the attainment of that level. An example of such an indicator is provided in Table 4 in the annex.

The relative position of countries in terms of total years of schooling is affected not only by the percentage of the adult population with higher levels of completed education such as Upper Secondary and Tertiary levels, but also by the average durations of these levels. It should be noted that the existing ISCED classification system has been found to be weak in many important respects of international comparability and is currently the subject of a review by UNESCO with the active involvement of OECD. Hence, measures of human capital based on completed ISCED levels need to be treated with caution, especially where similar types or levels of programmes are being classified according to different ISCED levels. It should also be noted that these measures may provide inadequate measures of skills learned or developed both during and after completion of formal education. No account is taken, for example, of the effects of enterprise-based training.

International Adult Literacy Survey (IALS)

The results of the International Adult Literacy Survey, (OECD, 1995c) provide a novel approach to the measurement of skills and competencies in an international context. The first round of this Survey entailed a sample of adults in seven countries according to three domains of skill: prose, document and quantitative skills. Examples of some published results from IALS are shown in Table 5 in the annex. The results suggest that the relationship between skills and completed levels of education is not clear-cut. For many countries, significant differences in skill levels appear to exist within groups with the same level of educational attainment, as well as between generations with similar educational levels. There is growing evidence from IALS and other sources that much learning and skill acquisition (as well as skill attrition) takes place after completion of formal education, either through self-learning, on-the-job learning, and formal enterprise-based training.

There was a consensus view at the expert meeting held in January about the need to continue work on IALS in both the short- and long-term perspectives as this offered a rich data source in which skills could be directly compared with various characteristics of respondents as well as outcomes in terms of earnings and labour market experience. A number of additional countries are joining the second round of IALS which is scheduled to be completed in 1998. As part of the first objective, it should be possible to use the existing IALS database to compare literacy scores for different sub-groups in the population according to labour force status, earnings and completed education level. However, it is important to bear in mind that

human capital is more than the sum of its parts, and that the identification and measurement of a finite number of specific skills does not provide a complete account of human capital stock.

Student achievement

As stated earlier, an index of years of schooling does not take into account the extent to which schooling contributes to the acquisition of skills and competencies considered to be central to a definition of human capital. One partial way of addressing this issue is to use the results of international surveys of student achievement such as those of the International Association for the Evaluation of Educational Achievement (IEA) in Network A of the INES project (dealing with student outcomes). The indicator envisaged here is a comparison of mean scores in Reading, Mathematics and Science for various countries participating in IEA surveys. However, the results of these surveys can only provide a partial measure of the effects of schooling for individuals at the ages of 9 and 14. To the extent that significant learning takes place at a later stage of formal education as well as beyond formal education, the results of student achievement tests do not provide a reliable guide to the stock of human capital in the population as a whole. However, it may be useful to compare student achievement results with measures of human capital stock for the adult population. Literacy acquired in school is a key to further educational attainment and labour market outcomes.

Estimating the monetary value of human capital stock

The imputation of a monetary value to the stock of human capital poses many conceptual and empirical problems as exemplified by a recent report of work in progress by the World Bank (1995) which used a methodology for estimating the stock of human, natural and produced assets in various countries. In relation to human capital, a monetary value was ascribed to an estimate of the stock based on the future income pool that today's population might expect, other things being equal, discounted at 4 per cent per annum. This approach to estimating the value of the stock of human capital (which included both years of schooling and level of nutrition) should be evaluated by OECD with respect to its feasibility and relevance in the context of OECD countries.

Third domain -- measuring the impact of human capital formation

Labour market outcomes of education and training for individuals

The relationship between education and labour market status and earnings is reported in a number of indicators in *EAG*. In particular, labour force participation rates can be related to highest completed education level for different age-groups and genders (indicator C11). Likewise, unemployment rates for various age-groups can be related to highest level of education (indicator R21). Finally, mean earnings of persons at a given level of educational attainment can be compared with those of persons at a lower level (indicator R22).

The impact for individuals in terms of earnings and labour force status from participation in publicly-sponsored labour market training is a matter of concern to policy-makers. Analyses of existing data-sets in various countries could be undertaken to examine the impact of various public training schemes on the labour market experience of individuals. However, much of the analysis and results in this regard is specific to particular national training schemes and even different sites where a scheme is provided. In view of the lack of comparability in this area, the work should focus on taking stock of existing data results and findings with a view to a more standardised approach at a later stage. Consequently, it is not

envisaged that comparable indicators can be developed in this area in the period to the end of 1997. At a more aggregate level, expenditure for labour market training programmes aimed at the young unemployed could be compared with unemployment rates of young people.

The lack of uniformity in school-based vocational programmes both within and between countries, as well as over time, makes it difficult to compare labour market outcomes between general and vocational programmes. The fact that much of the evidence in this area is inconclusive or specific to a few countries underlines the need for new data sources. Existing household or enterprise surveys can yield useful information to analyse outcomes for individuals who participated in different types of programmes such as school-based general and vocational programmes. A possibility which should be evaluated is that of using standardised enterprise surveys in the future to obtain more precise information about the relationship between earnings and different types of educational programmes.

Private rates of return to investment in education and training

Economists and policy analysts have found it useful to focus on the concept of the “rate of return” to investment in education and training. One approach under this heading is based on estimates of internal rates of return, obtained by taking the discount rate which equates the present value of earnings over a lifetime, to the investment costs which include forgone earnings as well as expenditure for education. Earnings' differentials for higher levels of education are treated as a proxy measure for marginal productivity associated with more education.

Estimates of rates of return by Alsalam and Conley (1995), shown in Table 6 in the annex, are related to data on labour market earnings of individuals by completed education and cost estimates for each level. Typically, the data sources include labour force or other household surveys. These estimates relate earnings of individuals with a particular level of education to the total cost, both private and public, of producing a graduate at that level. The data include public costs of vocational and apprenticeship training in the regular school system, but exclude costs of enterprise-based training. Although these estimates include public costs, they remain essentially measures of private returns due to the inclusion of individual earnings only, on the return side. As Alsalam and Conley (1995) observe, “most of the literature on the rate of return to education does not clearly distinguish between the private and social rates of return to education...” (p. 88).

A number of caveats are required in interpreting the data shown in Table 6 in the annex. In particular, it must be noted that the calculations are sensitive to the estimate of duration of studies at a given ISCED level, as well as the estimate of cost per student for a given level. Also, the definition and reliability of data on earnings may vary across countries. Moreover, it is necessary to bear in mind that many factors other than education impact on earnings such as collective wage bargaining, job experience and innate ability. Rates of return to education suggest an association between education and earnings. In particular, it is important to attempt to distinguish between the productivity-enhancing role of educational qualifications and the sorting role. To the extent that employers use educational qualifications to screen new employees, the impact of education on earnings is compounded with other effects.

It is proposed to enhance the comparability of the data presented in Table 6 making a number of adjustments, for example, by improving the estimates of cost and duration of studies and present this as an indicator under the first objective.

Impact of enterprise-based training

The methods of gathering statistics on training, the definitions of what constitutes training, the reference periods for counting training events, and the population coverage vary widely among OECD member countries (OECD, 1991). Consequently, international comparisons using basic statistics such as the incidence of training, the sources of training, and training expenditures are extremely hazardous. Work on the development of an OECD manual on training statistics will contribute to an improvement in the definition and classification of statistics on enterprise training. Consequently, the data presented in Table 3 in the annex need to be treated as illustrative rather than comparable.

Summary of First Objective aims

The first objective is to produce a set of indicators as described in Table 1 below. An incremental approach is necessary where marginal improvements can be made to indicators and where other areas such as enterprise-based activity can be gradually integrated into the study. It will be necessary to go beyond measures of the incidence and volume of training to develop measures which can relate training to skill enhancement and enterprise performance.

Table 1: An overview of proposed First Objective indicators

<i>Title of proposed indicator</i>	<i>Principal data source</i>
First Domain -- investment in education and training (input measures)	
Total public expenditure for education relative to GDP and total public expenditure	<i>Education at a Glance</i> (indicators F01 and F13)
Total public and private expenditure for education per student per annum	<i>Education at a Glance</i> (F03)
Total public and private cost of a graduate at Upper Secondary and Tertiary level	estimates based on <i>Education at a Glance</i>
Total private expenditure (both household and enterprise) for education relative to GDP	<i>Education at a Glance</i> (F01)
Total public expenditure for labour market training programmes relative to GDP and total public expenditure	<i>Employment Outlook</i> , Statistical annex
Enterprise expenditure for training relative to total wages and salaries	<i>Employment Outlook</i> 1991 and more recent information
Enterprise expenditure for training per employee or recipient	various national training surveys
Rate of participation in job-related continuing education and training for the adult population	<i>Education at a Glance</i> (P08)
Rate of participation in enterprise-based training	<i>Employment Outlook</i> (1991)
Rate of participation in training programmes for the young unemployed	<i>INES project and Employment Outlook</i>
Second Domain -- measuring the stock of human capital	
Highest completed education level and years of schooling in the adult population	<i>Education at a Glance</i> (C01)
Average literacy scores for the adult population	IALS
Average literacy scores for students aged 9 and 14	<i>Education at a Glance</i> / IEA
Third Domain -- measuring the impact of education and training (output and returns)	
Participation in the labour force according to highest completed level of education	<i>Education at a Glance</i> (C11)
Unemployment and highest completed education level for the adult population	<i>Education at a Glance</i> (R21)
Average annual earnings by highest completed level of education for the adult population	<i>Education at a Glance</i> (R22)
Estimated private rates of return to investment in education (excluding enterprise-based training)	<i>Education at a Glance</i> (R22) and other sources

Second objective

As a second objective, it is proposed that in the period to the end of 1997, an analysis be undertaken in relation to four goals which need to be addressed from a medium to long-term perspective, and where significant shortcomings exist in the comparability, coverage and usefulness of data sources. These goals are summarised under the headings of (1) enterprise-based training, (2) lifelong learning, (3) measures of skills, and (4) rates of return to education. This analysis should aim to identify new indicators and sources of data, as well as likely costs and time implications for carrying out significant work in these areas.

Enterprise-based training

Indicators relating to training in enterprises and its impacts need to be significantly improved or developed where none presently exist. The long-term aim should be to bring statistics in this area to an acceptable level of international comparability and depth of coverage. The feasibility of developing these measures on the basis of a standardised framework of enterprise surveys should be examined. Improvements in data sources related to individual enterprises probably offer the best hope of establishing links between training and individual and company performance. In a few countries, employee and enterprise data have been linked (such as by INSEE -- *Institut national de la statistique et des études économiques* -- in France) and used in numerous research studies (for example, refer to Abowd, Kramarz and Margolis, 1994). However, linked micro-data sources have been generally missing. Several possible indicators from an analysis of micro-level data include the analysis of the inter-relationship between earnings, labour turnover and age of workers (OECD, 1993, and Lynch, 1994).

Administrative sources of data should also be considered as a means of obtaining data on enterprise training and other activities.

It is desirable to link enterprise performance to managerial practice and culture as well as individual human skills. In developing this sort of analysis in an internationally comparable context, it is necessary to conduct comparable enterprise studies according to a commonly agreed framework across a number of countries. This sort of analysis has already been initiated in relation to the flexible enterprise surveys carried out in a number of countries under the aegis of the Directorate for Science Technology and Industry and the Directorate for Education, Employment, Labour and Social Affairs.

Lifelong learning

There is an absence of data sources which could be used for comparing investment in lifelong learning and its impacts at an international level. As referred to above, data sources on enterprise-based training, continuing education and training for adults, and other forms of learning outside the education and enterprise training sectors are not adequate in relation to measuring the investment in, or outcomes from these forms of training. As part of the analyses under the second objective, it would be desirable to examine the feasibility and implications of developing new data sources in this area.

Measures based on skill

An alternative approach to using ISCED or years of schooling described in the first objective above, has been discussed in "Data on human capital in OECD databases and publications and associated measurement problems", OECD (1996). This is based on the use of the **International Standard Classification of Occupations** (ISCO-88). This is an international classification for various occupations

which incorporates four skill levels that are approximately based on the existing entry-level qualifications for occupations according to ISCED levels. In this way, the total adult employed population could be classified by these four broad skill levels corresponding to groupings of eight of the ten major ISCO-88 groups. The principal drawback with this approach is that, from the point of view of international comparability, occupational data and classification may not be entirely consistent across countries. Moreover, ISCO cannot distinguish between different skills within occupations. Nevertheless, ISCO-based data may provide a useful complement to data based on ISCED. Occupation data based on ISCO have been used with some success in a recent study by the Directorate for Science, Technology and Industry (OECD, 1995b) dealing with up-skilling and de-skilling within industries in OECD countries.

The IALS date-set offers a rich source in which various hypotheses can be tested for identifying the crucial underlying factors in individual success and earnings in the labour market. In particular, the development of micro data-sets in which returns to different forms of investment in human capital can be measured, while controlling for various factors, will require substantial commitment from participating countries in the developmental phase. However, the development of such a data source is essential if analysts wish to move beyond many of the existing constraints and obstacles to international comparisons in this area.

In the medium to long-term, there is a need for better and more comprehensive measures of skill levels in the adult population using IALS as well as the results of enterprise surveys in which skills can be directly related to performance at both individual and enterprise level.

Rates of return to education

Notwithstanding the limitations in estimates of private rates of return, a number of improvements could be made such as better per-graduate cost estimates and better data on the forgone earnings of students. However, these improvements cannot be implemented quickly as these are areas where changes to existing reporting categories will take time to introduce. The most significant gap in information is the lack of data on social benefits to investment in education and training. The social cost of not investing in education, especially in relation to early school departures, may be very high in terms of welfare, health and other areas of public expenditure. It should be possible to examine the feasibility of incorporating fiscal returns in standard measures of rates of return. Also, it would be desirable to examine the possibilities of developing measures of rates of return which distinguish between University and Non-university tertiary education, general and vocational education, and formal education and various types of post-school training, including enterprise-based training.

In addition to pursuing rates of return analyses based on aggregate data sets, it is necessary to take into account the results of research using Mincer earnings equations (Mincer, 1974). This approach is based on the results of regression equations using cross-section data on earnings and completed education levels where a number of other effects on earnings are taken into account including labour market experience and options such as union membership and socio-economic status. It is proposed to compare the results of various studies using Mincer equations with those for internal rates of return as published in Alsalam and Conley (1995). In the long-term, it may be possible to develop an international comparative project in which micro-wage data are analysed in a standardised framework. It is envisaged that a technical manual should be developed to describe in detail various technical and methodological aspects of measurement of human capital and its impacts. This manual could be useful in establishing a benchmark for analysts using measures of internal rates of return.

At a macro-level, numerous studies have accorded to education the central role in explaining the dissemination of knowledge in the economic growth process, [(Barro (1992), Lucas (1988),

Psacharopoulos (1984) and Romer (1986)]. A number of models at both the macro- and micro-level suggest human capital formation and its use may have a number of economic and social benefits not captured in traditional rates of return measures. Externalities and “spill-over” effects may impact on the decisions of individuals, enterprises and governments to invest in education and training. (Bourdon and Orivel, 1996; Finegold, 1996; and Levine, 1996). It will be necessary as a second objective to pursue the analysis of macro-economic effects of education and training, in particular to examine the feasibility of providing measures of the social benefits and returns to education which go beyond private returns to individuals.

It should be noted that a wide range of non-monetary benefits to society such as better health, reduced poverty, lower crime rates and increased levels of personal satisfaction of individuals derived from a given level of income cannot be readily quantified.

As a start to measuring social returns, it will be necessary to examine empirical findings in various countries with respect to fiscal returns to public expenditure on education. These returns include the additional tax revenues arising out of higher incomes and economic growth, as well as the total public costs associated with producing a graduate at a given level of education.

Concluding remarks in relation to the second objective

The question of including human capital investment in national and public accounting frameworks is a necessary step at some stage in the future. So also is the question of encouraging a revision of company accounting practices to reflect more explicitly human capital investment and depreciation. However, these innovations would entail a very substantial and ambitious programme of work which certainly would go beyond what is feasible in the short-term and probably also in the medium-term. However, the issue will need to be explored, with a view to a possible implementation at a later time.

The need to set investment in human capital in a broader economic context against other types of investment may raise the question of regularly publishing data series on human capital investment in some of the main economic publications of OECD. This integration of human capital into the mainstream of economic data on factor inputs could be achieved gradually beginning with statistics of investment flows represented by expenditure for human capital. At a later stage, estimates of social rates of return to investment in education and training may be developed to reflect some key social benefits and these could be presented alongside other rates of return to physical capital. Depending on the progress in refining and improving indicators of human capital investment in the period to the end of 1997, consideration could be given to expanding and integrating the set of human capital indicators at a later stage in economic publications of OECD.

Further work is needed on the extent to which enterprises and individuals face disincentives to invest in training due to externalities and how these might be feasibly measured for international comparative purposes. Furthermore, comparative indicators relating to enterprise organisation and management as an aspect of human capital and organisational learning should be developed in which company performance can be evaluated against such characteristics.

Next steps

In the light of the two objectives outlined above, it is proposed that work commences in June 1996 leading to the production of a major report on “Human Capital Investment and Returns in OECD Countries” before the end of 1997. The Report should cover two parts: a set of indicators of human capital and its

impact based on existing data sources as contained in Table 1 above, and secondly, an analysis of those areas in which significant gaps exist in the availability of internationally comparable data together with an identification of new measures and performance indicators and the implications for the Secretariat and member countries in terms of costs of data collection. The second part of the report should address the following issues:

- broad social and economic returns to education and training, including lifelong learning;
- enterprise based training
- an evaluation of the feasibility of integrating indicators of human capital in some of the statistical publications of OECD.

To achieve these objectives, the Secretariat would require staff resources in the following areas over a period of 18 months to the end of 1997:

- one project post at A3 level (specialist in human capital investment);
- one project post at B4 level (data analyst);
- six months of consultancy work;
- missions (North America, Europe, Pacific -- one each).

The proposed work should be carried out within the Directorate for Education, Employment, Labour and Social Affairs and the Centre for Educational Research and Innovation, in close co-operation with the Economics Department of OECD, the Directorate for Science, Technology and Industry and the Statistics Directorate.

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ANNEX

Table 2: Incidence of continuing education and training for the adult population, aged 25-64, over all types of job-related training including off-the-job training

[Percentage of employed persons reporting training in Labour Force-type Surveys]

	year	25-34	35-44	45-64	Total
during one year prior to survey					
Canada	1991	32	35	23	30
Finland	1990	51	49	40	46
France	1992	43	27	11	27
Germany	1991	33	29	21	27
Norway	1991	40	42	30	37
Sweden	1993	36	33	41	36
Switzerland	1993	42	41	34	38
United States	1991	37	43	33	38
during 4 weeks prior to survey					
Denmark	1991	17	17	11	15
Ireland	1992	5	4	2	4
Spain	1992	6	2	1	3
United Kingdom	1992	12	12	8	11

1. Data exclude full-time vocational studies at tertiary level..

Source: *Education at a Glance* (OECD, 1995a)

Table 3: Incidence of enterprise training

[Percentage of employed persons reporting some kind of training in Labour Force-type Surveys]

age group	Australia (1989)	Finland (1987)	France (1989)	Germany (1989)	Ireland (1989)	Spain (1990)	Sweden (1987)	Great Britain (1990)	United States (1983)
15-19	²	²	43.2	75.9	28.0	5.8	²	23.0	18.1
20-24	92.6	30.3	9.2	19.8	13.6	5.4	20.0	19.0	28.6
25-34	83.2	39.6	4.6	8.0	6.2	3.3	26.9	17.0	40.2
35-44	77.1	40.2	2.3	4.0	4.0	1.4	29.1	15.0	42.2
45-49	64.6	31.5	1.5	2.4	2.6	0.1	27.5	12.0	38.0
50 +	49.0	20.4	0.6	***	1.7	0.01	18.2	7.2	29.5
Total ¹	79.0	35.1	4.6	12.7	7.8	2.4	25.4	14.4	35.8

1. "Total" means all employees.

2. Data for Australia, Sweden and Finland reported for 20-24 year olds relates to 15-24 age-group.

3. Alternative data from enterprise-based surveys indicate a training rates of 26.6 percent for 16-67 years olds in France in 1988, compared to 4.6 percent above, a rate of 36.7 percent for Japan in 1989 (within the previous two years), 25.0 percent for the Netherlands in 1986 (formal in-house company training only), and 33.1 percent for Norway in 1989. For more details of definition of training, reference periods and data sources, refer to *Employment Outlook* (OECD, 1991).

Source: *Employment Outlook*, Table 5.1a (OECD, 1991)

Table 4: Average years of schooling in the adult population (1992)

Country	highest completed level of schooling (% of total population aged 25-64)					Estimated years of schooling
	Below lower secondary	Lower secondary only	Upper secondary only	Non-university tertiary	University tertiary	
Germany	-	18	61	10	12	13.2
Switzerland	-	19	60	13	8	13.1
United States	6	10	54	7	24	12.6
Canada	11	18	30	26	15	12.3
Austria	-	32	61	-	7	12.1
Norway	1	20	54	13	12	12.1
Sweden	-	30	46	12	12	11.8
Australia	-	47	30	11	12	11.7
United Kingdom	-	32	50	8	11	11.7
Finland	-	39	43	8	10	11.4
Denmark	-	41	40	6	13	11.4
Netherlands	17	25	37	-	21	11.3
New Zealand	32	11	33	13	11	11.1
France	26	22	36	6	10	10.3
Belgium	28	26	25	11	9	10.2
Ireland	32	26	25	9	8	9.6
Spain	61	16	10	3	10	8.4
Italy	37	35	22	-	6	8.4
Portugal	78	8	8	2	5	7.3
Turkey	80	6	9	-	5	7.1

1. Note that the data in the above table were obtained from *Education at a Glance* (OECD, 1995a). The estimated number of years of schooling of the adult population was obtained by applying average duration for each completed level to the percentages of adult population in each country classified by highest completed level of education. The principal source of information for the estimation of average duration of each ISCED level for each country was a national taxonomy of education levels carried out by Network B of INES (refer to *OECD Education Statistics*, 1995).
2. Average duration may vary considerably across fields of study at Tertiary and Upper Secondary level as well as over time for different generations or age-cohorts. The estimation of average years of schooling is not a precise estimate of the actual average number of years of schooling, since no account is taken of time spent by persons who drop out in the course of studies at a given level.

Table 5: Proportion of population (including non-economically active persons) at each literacy level (document scale¹) who are unemployed (1994)

	Percentage			
	Level 1	Level 2	Level 3	Level 4/5
Canada	9.3	4.1	3.2	2.6
Germany	20.1	11.0	9.1	2.6
Netherlands	7.6	7.5	2.7	0.9
Poland	25.8	13.9	6.5	3.8
Sweden	23.1	12.4	4.9	1.8
Switzerland (French)	8.5	4.5	3.9	1.6
Switzerland (German)	3.4	3.0	2.9	0.7
United States	6.1	8.3	3.9	1.4

1. Document scale represents one of the three types of skills tested in the International Adult Literacy Survey. The other scales relate to quantitative and prose scales.

Source: IALS Survey, (Table 3.2) (OECD, 1995c)

Table 6: Rates of return to education in selected OECD countries, by gender and ISCED level, 1992

	Men				Women			
	Lower secondary	Upper secondary	Tertiary non-univers.	Tertiary univers.	Lower secondary	Upper secondary	Tertiary non-univers.	Tertiary univers.
Belgium	-	3.5	15.7	7.5	-	2.6	5.7	12.9
Denmark	-	11.4	3.8	10.9	-	11.2	3.6	8.2
Finland	-	7.6	12.8	15.1	-	5.9	13.6	14.4
Germany	-	11.3	16.5	13.9	-	7.1	6.7	9.3
Netherlands	8.8	11.2	6.9	9.9	9.5	15.4	1.7	7.6
Spain	11.2	10.4	-	10.8	13.5	9.8	-	12.9
Sweden	-	6.9	8.2	11.8	-	6.0	7.4	10.0
Switzerland	-	13.2	12.8	7.5	-	18.0	8.6	4.9
USA	10.8	19.0	10.5	12.9	5.1	18.6	12.5	12.2

1. Data for Belgium and the Netherlands refer to 1989. Data for Spain refer to 1991.

2. The rates of return in the above table correspond to estimated discount rates. These are equivalent to the rate that would make the increased earnings associated with each education level equal to the increased costs, both public and private, associated with completing that level. The data do not take account of social benefits or externalities deriving from education. They include returns to investment in initial vocational education in the regular school system but do not include continuing vocational education in enterprises.

Source: Alsalam and Conley (1995).