Skills for the knowledge and service society

Trends determining future pre-service and in-service VET needs

Arthur Schneeberger
Educational and occupational research
IBW – Institute for Research on Qualifications and Training of the Austrian Economy, Vienna

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SUMMARY

The change-over to a knowledge and service society means greater opportunities for the highly skilled. Participation in tertiary education is increasing in all countries, and it can be seen that graduates are being absorbed into knowledge-intensive services in the labour market. The international trend towards making vocational education and training part of tertiary education is a response to changes in the demand for skills and to educational ambitions: post-training training is becoming more widespread. The vast majority of jobs will nonetheless continue to be for 'trained operatives' with mid-level and lower-level skills. The decline in the production sector is reducing the scale of simple jobs and is hence a major factor in the increase in specialist training. Many service jobs may not demand lengthy job-specific training, but they do require generic basic academic and behavioural skills. The smaller the job-specific element of the job profile, the greater the element of generic skills required (such as teamworking and customer and service focus). Such basic education and training for all young people is therefore becoming increasingly necessary for employability and as a platform for lifelong learning: general adult education ('personality stabilisation') and the importance of job-specific in-service updating training are growing at all levels of the employment system.

With the move towards the knowledge and service-based society, far-reaching changes have taken place in the structure of employment, in skill requirements and in life styles by comparison with earlier phases of the industrialised society. Education and training systems, and the educational behaviour of the public, have also changed greatly in recent decades. By examining international trends, and looking more specifically at the changes in the structure of employment and skills in Austria, this paper aims to help clarify the direction in which changes in skill requirements are moving, and what kind of appropriate responses can be made.

Structural economic change and computerisation

The proportion of the working population employed in the services sector has risen steadily in Austria in recent decades, as in all industrialised countries, from 60 to 68 % between 1991 and 2001 (the observation interval of the last two national censuses). The proportion of the working population employed in the manufacturing sector fell in the same period from 24 to 19 % (Bauer, 2004, p. 386). At the same time, however, output was 30 % higher than in 1991. These developments took place against a background of technological change and a high degree of international division of labour.

The impact of technological innovation on the employment system can be captured approximately by means of the indicator 'use of computers at work' (Ottens, 2003, p. 5). In 2002, a little over half the working population used a computer for occupational purposes in the EU (15 countries), the values ranging from 30 % to over 70 % (in Denmark, the Netherlands, Finland and Sweden). Austria, with a figure of 62 %, was towards the top of the range for computer penetration into the world of work. This percentage had almost tripled by comparison with 1994 (21 % computer usage among the working population; Statistik Austria, 2001, p. 132).

Globalisation – the other trend seen to lie behind changes in the labour market – means that the domestic economy must increasingly react to world market stimuli. Nearly 52 % of the Austrian Gross Domestic Product (GDP), for example, is created by the export of goods and services, and this proportion amounts to 34 % among the countries of the EU-15 as a whole (Wirtschaftskammer Österreich, 2004, p. 14). Technology and industry have been made increasingly productive by technological innovation and global networking, division of labour and competition. In consequence, the preconditions have been created on the one hand for growing employment in the services sector, while on the other hand, increased productivity builds on previous knowledge-intensive input, particularly from the education, science and research sectors, and on infrastructure development. In Austria, for example, the proportion of the working population in the 'data processing and database' sector who are not self-employed has risen by 162 %

since 1995, the proportion in 'research and development' by 102 %, and that in 'delivery of enterprise-related services' by 67 %. The figures are taken from the Association of Social Insurance Agencies (Hauptverband der Sozialversicherungsträger; Schneeberger/Petanovitsch, 2004, p. 36).

Far-reaching changes to the structure of employment and skill requirements

In the 2001 census, the job structure of the working population in Austria was captured for the first time in accordance with the international ISCO-88 system of occupational categories, using the EU version, ISCO 88 (COM) (Bauer, 2004, p. 388). By far the greatest change in the job structure between 1991 and 2001 was the growth in *physical, mathematical and engineering science professionals, teaching professionals, life science and health professionals* (+88 %). The number of *legislators, senior officials and managers* in the public and private sectors also rose considerably (+34 %). Growing classes of managers, researchers, engineers and creative workers act as the driving force behind economic development, using their scientific and analytical thinking, their commitment to innovation, high flexibility, social communications skills and international outlook (Florida, 2002, p. 235ff.). The two occupations together account for around 17 % of the working population. Further growth in the public sector will generally slow because of budgetary limitations.

The vast majority of the working population with some kind of training will in future still be found in mid-level occupational categories, although there will be a shift in the pattern. Trained executives in interme-

Table 1. **Structural change by occupational category 1991-2001: Numbers employed**

ISCO-88: Main occupational categories	1991	2001	Change	
			Absolute	Relative
Physical, mathematical and engineering science professionals, teaching professionals, life science and health professionals	159 294	298 744	139 450	88 %
Legislators, senior officials and managers	230 426	309 561	79 135	34 %
Technicians and associate professionals	596 039	684 193	88 154	15 %
Office clerks and customer service clerks	446 387	476 203	29 816	7 %
Elementary occupations 9	394 153	408 166	14 013	4 %
Service workers and shop and market sales workers	460 897	466 591	5 694	1 %
Armed forces	43 654	40 945	-2 709	-6 %
Plant and machine operators and assemblers	294 181	261 930	-32 251	-11 %
Craft and related trade workers	646 763	517 097	-129 666	-20 %
Skilled agricultural, forestry and fishery workers	196 710	135 870	-60 840	-31 %
Total	**3 468 504**	**3 599 300**	**130 796**	**4 %**

Source: Statistik Austria, censuses; author's own calculations

Table 2a. **The five occupations in the United States showing the fastest growth: Projection 2000 – 2010 by average income and typical education**

Occupational category	Persons employed		Income quartile 2000*	Typical education
	Number 2000	Growth by bis 2010		
Computer software engineers, applications	380 000	100 %	1	*Bachelor's degree*
Computer support specialists	506 000	97 %	2	*Associate degree*
Computer software engineers, system software	317 000	90 %	1	*Bachelor's degree*
Network and computer systems administrators	229 000	82 %	1	*Bachelor's degree*
Network systems and data communications analysts	119 000	77 %	1	*Bachelor's degree*

* Median annual income 2000
Source: Bureau of Labour Statistics: Occupational Outlook Quarterly, Winter 2001-02

diate technical, commercial and media jobs with broad across-the-range skills act as the core of the knowledge-based economy. This is reflected in particular in the growth in the occupational categories *technicians and associate professionals* and *office clerks and customer service clerks. Plant and machine operators and assemblers* have clearly declined (-11 %), and *craft and related trade workers* even more acutely (-20 %). The greatest drop has been among skilled workers in the primary sector of the economy (-31 %). The change is seen most clearly in the relationship between *craft workers* and *technicians*. In crude terms, it can be said that there were more *craft workers* than *technicians* in 1991 (109 to 100), but that this relationship has now been reversed (76 to 100). The proportion of support staff remained practically unaltered over the observation period. The figures for general services such as retailing and catering rose slightly.

A look at the job structure and the outlook for employment in a highly developed service economy such as the United States([1]), clearly demonstrates that the shift towards tertiary employment brings with it the need for a *wide range of skills* which open the way to a broad spectrum of jobs. It is true that computer and health services, some of which require post-secondary training, are growing *fastest*. However, the services with the most rapid expansion are headed by catering and retailing (Data from: Hecker, 2001, p. 79f.)

The employment projection for the United States shows the heterogeneity of skills requirements and hence the far-reaching diversity of pre-serv-

([1]) According to OECD calculations, the proportion of the working population in the services sector in 2003 was 77.5 % in the United States and 74.7 % in Canada; European countries with high figures were, for example, Sweden 75.1 %, the UK (2001) 73.6 %, and France 73.1 %; Germany 65.9 %, and Austria 64.8 %, showed appreciably lower tertiary percentages (Statistik Austria, 2004b, p. 531). According to the Eurostat Labour Force Survey of 2002, 67.8 % of the working population were employed in services in the EU 15 countries (Eurostat, 2003, p. 4).

Table 2b. **The five occupations in the United States showing the greatest growth: Projection 2000 – 2010 by average income and typical education**

Occupational category	Persons employed		Income quartile 2000*	Typical education
	Number 2000	Growth by bis 2010		
Combined food preparation and serving workers, including fast food	2206 000	673 000	4	Short-term on-the-job training
Customer service representatives	1946 000	631 000	3	Moderate-term on-the job training
Registered nurses	2194 000	561 000	1	Associate degree
Retail salesperson	4109 000	510 000	4	Short-term on-the-job training
Computer support specialists	506 000	490 000	2	Associate degree

* Median annual income 2000
Source: Bureau of Labour Statistics: Occupational Outlook Quarterly, Winter 2001-02

ice and in-service training needs in highly tertiary economies. In addition to the rapid growth in the need for graduates of relatively short initial training courses in computer-based occupations, the projection up to 2010 (see Table 2b) indicates that the proportion of jobs for which short in-house skills training is sufficient will remain steady, always assuming that basic competences are adequate. *Associate degrees*([2]) are a level to which not enough attention is paid in many countries in Europe. Trends analyses of educational behaviour consistently show, however, a tendency towards *tertiary* education.

Depth and spread of knowledge in the employment system

What impact does the *knowledge-based economy* have on the employment system and its vertical structure of occupations and skills? A 2002 survey in Austria (Lifestyle Study by Fessel-GfK, see Schneeberger, 2003) shows both the multiplicity of knowledge and interactive abilities required in more senior jobs, and the broad spread of demands in mid-level and simpler jobs. The correlation between depth of knowledge and awareness of the need for continual in-service education and training in higher levels of employment is empirically apparent, but it is also clear that almost two-thirds of the working population in so-called unskilled and semi-skilled jobs regard continual in-service education and training as important([3]) (Table 3).

([2]) Generally a two-year course at a community college, which can often be used under a credit transfer scheme towards a four-year Bachelor's degree course at a college or university.

([3]) The reply categories were: very important – quite important – not very – not at all important; important = very + quite important.

Table 3. **Information technology and knowledge-based employment by occupations, 2002**

Occupation	Features of respondents' occupational activities, in %				
	Knowledge of DP/computing is important (very important)	Knowledge of science and technology is important (very important)	Knowledge of economics/ commerce is important (very important)	Continual in-service education/ training is important (very important)	Interactive performance is important (very important)*
Senior civil servants (n=249)	85 (48)	44 (23)	78 (47)	96 (73)	86 (63)
Self-employed / professionals (n=191)	73 (42)	50 (26)	76 (44)	95 (68)	85 (62)
Junior civil servants (n=951)	79 (48)	37 (17)	59 (32)	90 (61)	79 (54)
Skilled workers (n=518)	49 (22)	59 (21)	40 (12)	84 (53)	54 (24)
Farmers (n=110)	46 (17)	67 (24)	73 (31)	87 (48)	54 (29)
Unskilled and semi-skilled workers (n=297)	39 (16)	35 (17)	36 (9)	64 (37)	69 (42)
Non-self-employed in private sector (n=1.124)	63 (38)	43 (16)	59 (33)	83 (51)	66(39)
Non-self-employed in public sector (n=546)	71 (36)	46 (23)	41 (14)	90 (68)	83(61)
Total (n=2160)	**67 (37)**	**46 (20)**	**57 (28)**	**86 (57)**	**54 (29)**

* Statement: 'I have more to do with people (clients, patients, colleagues, pupils, etc.) than with machinery /technology.'
Source: Fessel-GfK, Lifestyle-Studie 2002; Schneeberger, 2003

Highly specialised knowledge on its own is generally completely inadequate in highly skilled and management jobs; communication skills or interactive performance competence, a high ICT user level, a knowledge of foreign languages and international mobility are often important or essential. Skilled occupations are characterised not only by extensive specialist knowledge requirements, but also by the *wide variety* of simultaneous demands.

The knowledge-based economy and the growing number of jobs in the services sector call not only for *top-level skills* (in order to be competitive internationally) but also for a broad class of *trained executives* in intermediate occupational positions. Whether these skills are taught in upper secondary or post-secondary education, under the dual system or in full-time training, varies widely internationally, depending on the national traditions of education and employment in the state in question (see Table A-1).

Simple repetitive jobs without the need for significant communication skills or the ability to interact with colleagues, clients, etc., are becoming increasingly rare. The ability to work as part of a team, and a customer or service focus, are required of around 70 % of unskilled and semi-skilled workers in their jobs. It is therefore clear that the job opportunities for the low-skilled have changed considerably. The number of 'low-skilled' workers has not fallen over the last ten years or so (at least according to the Austrian example), but the demands placed on them differ markedly from those of simple jobs in the past: broad basic competences (that can be used across sectors), the ability to work as part of a team, and a customer and service focus are increasingly required.

Countries with apprenticeship systems are affected by the structural change in a particular way: with the fall in the number of skilled trades people and plant and machine operators (especially in industry), there has been a sharp decline in the intake and output of one of the most widespread traditional methods of training apprentices – dual training at the place of work and part-time vocational college. In 2001, 60 to 70 % of people working in these kinds of jobs in Austria had trained as apprentices. However, the proportion of the two occupational categories (craft trades, machine operators, etc.) has fallen from 27 to below 22 % of the working population, and if this trend continues, it will only account for 16 % by 2011. With the growth in the services sector, the opportunities for training and employment in simple jobs in the agricultural and production sectors have withered internationally, so that new challenges are faced in the integration of young people into training and employment.

Current general education focusing on broad basic competences

There is wide empirical evidence that as a result of the changes in the world of work, traditional compulsory school education no longer automatically provides a broad basis for earning a living and active citizenship. As a result, the relatively new concept of 'basic education' or 'basic competences', which was first introduced into the discourse by educational researchers (e.g. Murnane, Levy, 1996) and has increasingly been taken up by supranational organisations such as the OECD (1997, 2001) ([4]) and the EU ([5]) as an attempt to respond to the new general demands of the workplace, refers principally to basic active skills such as language, mathematics, group communication and achievement, basic knowledge

([4]) In its PISA project, for example, the OECD is propagating the testing of life skills, which need to be fostered among school pupils and adults; see: OECD: Learning for Life (OECD, 2001, p. 18ff.).

([5]) The wording of the Memorandum on Lifelong Learning is as follows: 'This Memorandum defines new basic skills as those required for active participation in the knowledge society and economy' (EU Commission 2000, p. 10).

of computing, entrepreneurial spirit and an understanding of the culture of technology, as well as cognitive principles and the willingness to continue learning both on and off the job. One of the huge challenges facing education is to teach and foster the basic competences needed for participation in the information and services society both at work and in private life.

Given the revolutionary changes in the world of work brought about by information and communications technologies, by the growing importance of technology and knowledge in the economy, and by the expansion in services jobs, the principle of jobs tied to particular trades has lost its relevance as a training paradigm. As traditional occupations decline in the world of work, increasing importance attaches to transversal skills such as computing and languages, to generic skills such as the ability to communicate and work as part of a team, to a services orientation (a customer and services focus) and to entrepreneurship.

Specialist education and training in job-specific skills, and general education and training in generic skills, are *not* functionally of equal rank. While job-specific training provides theoretical and practical knowledge and skills in a specialised form, *generic training primarily expands the horizon in which they can be used (and restricts it at the same time!).* Generic education and training opens up potential areas of action which cannot be explored or exploited solely on the basis of specialist knowledge. Without social skills (team work, communication), for example, or entrepreneurship, high-level specialist knowledge may lie fallow if it remains tied to prescriptive instruction. This horizon-widening function of generic education and training, broadening areas of potential application, may differ depending on the *vertical* level of activity, but nonetheless generally holds true.

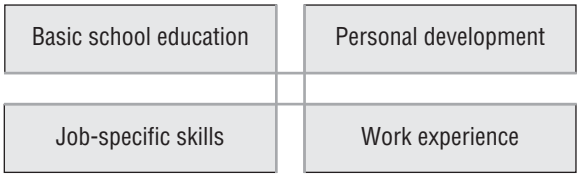
It can be assumed not only that the depth of the *generic skills* required will vary according to the vertical level of the job, but also that they will have a differing relationship to *job-specific skills*. Specific forms of generic skills will occupy a larger share in the case of simple jobs than in highly skilled jobs that call for a high degree of specialist skills. It remains to be seen whether new low-level vocational competences for low-skilled jobs will evolve out of what might be called specific bundles of generic skills. Induction into the workplace plays a particularly important part in the case of simple jobs. Behaviour and appearance may well be the crucial variable for acceptance as a trainee, and the basic skills learnt at school will then come into play in order to achieve learning objectives (Schneeberger / Kastenhuber / Petanovitsch, 2004).

Surveys of employers in Austria have shown that the overall impression of one's personality is the primary factor in the selection of young people for enterprise-based training, and that school marks are of secondary importance. There are complaints that about half of those taken on have poor basic educational skills (Schneeberger/Kastenhuber/Petanovitsch, 2004), but the vast majority nonetheless eventually qualify at the end of their training. These experiences demonstrate that it is social learning at work that

offers young people a real chance of catching up on their basic education, or major parts of it.

Experience of working and communicating with people of varying age and, frequently, culture, is particularly valuable for initial vocational training. While there is sufficient basis for this in many rural regions, young people growing up in an urban environment will often lack experience of working and communicating with heterogeneous groups. As argued above, the possession of generic skills as a means of exploiting specific knowledge, skills and competences is important not only in the upper reaches of employment, but also more generally, in suitable form. The term 'basic skills' implies

Figure 1:
Elements of integrated development of vocational skills



Source: Author's own design

the basic competences needed to act in a world of work and leisure marked by information and communication technologies, and hence also the minimum requirements for pursuing initial training and finding a job.

In fact, the rise in the minimum skills threshold is a problem in all developed societies. The change in the structure of employment and the demand for higher minimum skills result from the continuing decline in simple repetitive jobs in the primary and secondary sectors of the economy. As a consequence of the growth of tertiary sector employment, it is not only highly skilled knowledge-based services for which there is a demand, but also simple service jobs in areas such as catering and retailing, which may not require profound job-specific training, but do require minimum generic skills (ranging from reading and mathematics to a basic knowledge of data processing, e.g. Word) and social communication skills (customer and service focus).

Initial training as a 'platform' for lifelong learning – 'second rounds' to exploit the potential of skilled workers

The long-term rise in participation in continuing education and training as a result of structural change is empirically apparent. *Statistik Austria* found an annual rate of participation in 'vocational in-service training courses' of 12 % for the year 1989. By 2002/03, almost a quarter of the

working population were taking part in work-related courses or training (non-formal continuing education and training), and if so-called formal pre-service and in-service training (leading to publicly recognised qualifications) are included, that figure rises to 32 % (Statistik Austria, 2004, p. 325ff.).

As Table 4 shows, the prospect of *promotion* is the principal motivation for taking part in continuing training among 35-year-olds, while those over 35 years of age are primarily seeking to update out-of-date knowledge, taking *functional adaptive training* to maintain their employability (Statistik Austria, 2004a, p. 284ff.) Among the unemployed, *change of occupation* is the most frequent motivation. We thus see that people use continuing education and training in different ways to adapt to the change in the employment system. The only form of adaptation that takes place primarily in the context of periods of unemployment during a working career is retraining and change of occupation, or at least, this is what the above finding suggests.

Job-specific training cannot be provided via initial training or 'stored training' to the same extent as in recent decades. This has to do with a number of factors: the widely acknowledged decline in the size of younger age cohorts, migration by people beyond the age of initial education and training, and the pace of structural change and the spread of information technology, which cannot be dealt with through one-off computer training and requires continual ICT in-service training. It is therefore not surprising that just under 60 % of the working population regard continual in-service training as 'very important' for their work (see Table 3). However, there are few countries in which this is already matched by anything like as high an annual rate of continuing education and training. 'Second rounds' of pre-service training or 'post-training training' (e.g. supplementary examinations, intensive training for skilled workers, adult vocational colleges, higher education courses, etc.) are ways of better exploiting potential or of taking initial specialist training further to meet needs. These extensions of initial education and training well beyond the age of 20 years are cost-intensive and cannot be paid for exclusively by employers and employees. Given the external impact on the national economy of adequate investment in continuing education and training, it is vital for public spending to be involved.

Since barely a quarter of the Austrian working population is employed by large enterprises with their own training facilities, there is a need for non-company specific, sectoral and regional schemes and activities (e.g. training collectives). These should be built around assessment of continuing training needs and learning methods suitable for adults, so that funds are not wrongly invested. The requisite information and advice, and public support, are essential if resources are to be made available to the working population and SMUs where they are needed. Narrowly-vocational adult education is becoming increasingly inadequate, however. It cannot be assumed that adults will have acquired and will maintain generic basic

skills and stress-resistant, robust personalities throughout their working lives; growing social and communication requirements at work call for educational activities.

In the case of basic skills, there is no clear distinction between vocational and general education. While there are relatively high expectations that IT and data processing will be relevant to work (according to the June 2003 microcensus, three quarters of course participants in Austria in 2003/03 gave largely work-related reasons for their attendance), this is far less frequently the case with foreign language courses: the proportion then does not even reach 50 % (Statistik Austria, 2004, p. 115). The great importance of basic skills is also reflected in the interest in particular subjects in continuing education and training. Personal development and general subjects have priority throughout, particularly as the level of previous formal education rises. The changes in the structure of formal education can therefore be regarded in the long term as levers by which to increase the demand for adult education and train-

Table 4 Selected reasons for taking part in work-related courses among the working population of main working age, in %

		Reasons for taking part in continuing education/training*			
Working population by age group	In 1000	Knowledge out of date	To improve chances of promotion	To change job	To change occupation
25 – 29	102.8	15.8	35.1	1.6	3.0
30 – 34	136.9	22.4	26.7	2.3	2.8
35 – 39	153.2	24.0	21.5	1.2	2.5
40 – 44	147.2	27.8	17.3	1.7	2.3
45 – 49	105.9	37.0	13.8	1.5	1.2
50 – 54	75.2	37.8	8.8	0.5	0.6
55 – 59	34.7	32.9	5.0	0.4	0.5
60 – 64	5.8	24.6	-	-	-
Total	**867.6**	**25.2**	**20.9**	**1.6**	**2.3**
Unemployed	36.2	14.5	14.6	9.1	24.8
Managing households	13.1	30.0	15.3	2.7	22.8
Non-working total	**95.4**	**17.9**	**16.8**	**5.2**	**15.2**

* Selection, multiple reasons possible
Source: Statistik Austria, June monthly report 2003

ing. On the other hand, the ageing of the population calls for stronger incentives and provision that is appropriate to adults, if the educational impact is to be maintained.

While poor reading and writing ability among those leaving compulsory school education has led to expressions of concern, not least following receipt and discussion of the PISA 2000 results, the question of adults' basic skills can scarcely be answered adequately empirically. If, according to

the country average of PISA 2000, around 18 % of the 15 and 16-year-olds captured in the tests have poor reading skills when they enter training or employment (OECD, 2002, p. 195), the proportion will certainly be no smaller among older people, especially if, as is often argued in the research literature, it is less the weakness of age than the loss of skills through disuse ([6]) which results in an appreciably higher number of middle-aged and older adults with poor basic skills. However, this only becomes a problem when new demands are faced at work which require generic skills that are assumed but are in fact not available in sufficient measure.

The goal of extended working lives: the key variable of motivation

Adult education, whether vocational or general, is gaining in importance and potential in all fields. Citizens need a greater degree of job-specific continuing training and personal development than ten or twenty years ago. Given the rapid pace of change and the huge variety of contradictory experiences that need to be processed, personal development is needed in a global economy in order to promote and preserve the *stability of the personality*. Large private-sector organisations are aware of this fact and are doing something about it. But not all citizens have comparable access to adult education. Current surveys of participation and interest in adult education show considerable proportions of unfulfilled interest in general education, with computing, languages and health at the top of the list (Schneeberger/Schlögl, 2004, p. 54).

The need for and participation in adult education are changing both quantitatively and qualitatively, since motivation alters with age. Initial vocational training and the occupational principle are losing their crucial role in creating identity in the wake of change and breaks in people's working careers. The traditional close relationship between occupation and life style has become weaker and given way to variety and flexibility in living. As a consequence of modernisation and its problems – technological revolutions, economic growth, democratisation, internationalisation and secularisation – the conditions under which people live have changed and call for appropriate adaptation. It can be said that there has been a fragmentation of the context in which we live, going far beyond the labour market and employment and associated with a reduction in the number of areas of life governed by tradition, classic authority figures and fixed conventions. The social sciences point to the 'sectoralisation of social life into many different groups and individuals with contradictory ways of thinking and behaving' (Christof/Gruber/Pichler/Thien, 2004) as a key feature of post-modernism.

([6]) A broadly based discussion of the deficit hypothesis of ageing and of alternative explanations in relation to performance and learning ability (the disuse effect) are to be found in Koller / Plath, 2000, p. 118ff.

This creates a need for guidance, not least in adult education. Changed expectations of life also have an impact. In sustainable approaches to life-long learning, great priority is given to 'managing life around the core of life' and self-directed forms of learning (Knopf, 2000). It is not enough to limit personal development to youth. The take-up of continuing education for personal development and communication courses demonstrates the need, which extends across broad classes of occupation, although it has to date not been sufficiently accessible to those who might need it most.

Last but not least, the issue of longer working lives needs to be explored. In essence, this is scarcely an isolated matter of education and training, but a broad social goal. On average, only 40 % of 55 to 64-year-olds living in the 25 countries of the EU were still working in 2003 (Eurostat, 2004, p. 5). In Northern European countries, the proportion of this age group in work is considerably higher, however (e.g. Denmark 60 %, Norway 67 %, Sweden 69 %). In these countries, participation in general and vocational adult education is also above the average (Eurostat Yearbook. 2004, p. 83). The motivation to take part in continuing education and training does not exist in isolation but is usually tied to the anticipated opportunity to make use of it. Many people can work longer and would like to work longer (job satisfaction is very high in this sub-group), while others have to work longer. A glance at the employment rate differentiated by education shows that in extending working lives, we are at the start of a long process of change, in which education and training will play a key role alongside other factors (health, flexible working hours and ways of working, occupation, type of specialist knowledge, opportunities to take early retirement, salary increments based on seniority, etc.). From the point of view of education and training, attention needs to be given not so much to solid basic education for all, but above all to in-service training to update vocational knowledge and skills as required, and, if necessary, to retraining, so that current skills demands can still be met by 50-year-olds.

International consensus that vocational training should become tertiary education despite continuing diversity of systems

The move to make vocational pre-service training a form of tertiary education is perhaps the most striking international example of *convergence* between education and training systems. Despite differences in initial institutions and levels, there was a growth in the proportion of young people with tertiary qualifications living in all countries in the period 1991 to 2002 (see Table 5), although the content of 'tertiary education' varied widely.

This trend is also clearly reflected in current numbers of graduates and entrants. There are countries with tertiary enrolment rates of 70 to 80 % of young people of comparable ages (see Table 5). That means that

the overwhelming majority of young people aim to take initial vocational training or continuing training after upper secondary education. If it is assumed that the published tertiary enrolment rates are at least approximately realistic, and that the success rate is around 70 %, this means that the rise in tertiary qualifications (to 42 % in 2002; OECD, 2004, p. 77) is heading for 50 % of an age cohort.

Countries with classic *enterprise-based* apprenticeship systems (Switzerland, Germany and Austria) showed rates of tertiary education among the 25 to 34-year-old resident population in 2002 of between 15 and 26 %. However, the increase between 1991 and 2002, and the enrolment rates for 2002, reveal a clear trend towards tertiary-level vocational training here too.

Post-training training or supplementary initial training are also a convergent trend in vocational training in the broader sense in the different systems. Despite these differences in systems, it can be said that initial vocational training is being postponed and expanded so that attempts to secure

Table 5. **International comparative indicators of tertiary transition from school to employment**

OECD countries (Selected)	25 to 34-year-old resident population with tertiary qualifications			Proportion of new graduates 2002	Proportion of new entrants 2002
	Proportions in %		Relative		
	1991	2001	increase**		
Canada	32	51	59	-	-
Korea	21	41	95	-	55
New Zealand	23	40	74	-	105
Australia	23	36	57	45	77
United States	30	39	30	-	64
Sweden	27	39	44	37	81
Finland	33	39	18	49	71
Belgium	27	38	41	-	66
Spain	16	37	131	47	69
Ireland	20	36	80	48	58
France	20	36	80	43	59
United Kingdom	19	31	63	47	74
Denmark	19	31	63	-	62
Netherlands	22	28	27	-	54
Switzerland	21	26	24	37	49
Germany	21	22	5	29	50
Austria	8	15	88	21*	37*
Portugal	9	15	67	-	-
Italy	7	12	71	24	51
Country average	**20**	**28**	**40**	**42**	**67**

* Author's own estimate, since no data are published by the OECD for tertiary area B
** Figures for 1991
Source: OECD 2004

the best possible employment profile extend well beyond the age of 19 years (the trend being up to the age of around 35 years, see Table 5).

Although there is a common trend towards tertiary education, there are still considerable differences in systems, as the comparisons in Tables 5 and A-1 show. While alternating systems (workplace + vocational college or training centre) and vocational schools can be accessed from the age of 15 or 16 years in some European countries, this occurs later in other countries or is part of adult education (see Table A-1). A glance at the tertiary education enrolment rate, which varies from 40 % in Austria to 80 % in Sweden, gives an approximate idea of the extent of the differences in institutions, patterns of training and expectations. In some countries 'vocational training' already contains elements of 'higher education', while in others (with high academic tertiary take-up), higher education curricula also contain distinct elements of instruction, so that they can be classed as vocational.

It will become increasingly difficult to keep vocational education and training at upper secondary level. Countries with high tertiary enrolment rates include in this level of formal education qualifications which are regarded as being at upper secondary level in countries with relatively low enrolment rates in the higher education sector, and traditionally relatively long first degree courses (e.g. ophthalmology, nursing, technical and commercial subjects, etc.). This growing lack of clear boundaries, which goes with the expansion of the tertiary sector, is also affected by the diversity of education and training traditions and manifests itself for example in the Maastricht joint Communiqué issued by the Ministers responsible for vocational education, the social partners and the European Commission on 14 December 2004, which grew out of the Copenhagen Declaration of 30 November 2002: 'VET is increasingly taking place at all educational levels and, therefore, the parity of esteem and links between VET and general education, in particular with higher education, need to be fostered by innovative strategies and instruments at the national and European level.' (Maastricht Communiqué, p. 2).

'Translating' country-specific qualifications into European 'labour market currency' therefore calls for complicated 'conversion mechanisms' guided primarily by the framework of reference, competences, level of use and sectors of the employment system, and rather less by formal levels of education, in order to build up trust and acceptance across national borders. This is an indispensable requirement for greater mobility between regions in the vocational education and employment system in Europe, so that skills flow in future to where they will be used and can create income (Tessaring/Wannan, 2004, p. 5.).

This is one of the reasons why the task of creating a basis for the transparency of vocational skills and the recognition of vocational qualifications in the various system-specific versions of training for middle-level jobs is so lengthy and difficult. VET (vocational education and training) is interpreted in widely differing ways in Europe and internationally, as are the as-

sociated institutions of the employment system. To restrict mobility to higher education would be counter-productive, however, if European growth and standard of living targets are to be met. ■

Table appendix
Table A-1:

Comparison of the upper age-limit of compulsory education and the upper secondary course structure in European countries, 2002

Country	Age to which education is compulsory	Type of course (proportions in %)			
		General	Pre-vocational	Vocational	Of which: combined school and enterprise-based training
Switzerland	15	35	-	65	59
Denmark	16	47	-	53	53
Germany	18	37	-	63	51
Slovakia	16	24	-	76	41
Czech Republic	15	20	-	80	38
Austria	15	21	7	72	36
Netherlands	18	31	-	69	24
Hungary	16	50	37	13	13
France	16	44	-	56	12
Finland	16	43	-	57	11
Belgium	18	30	-	70	3
United Kingdom	16	28	-	72	-
Norway	16	42	-	58	-
Sweden	16	50	-	50	-
Greece	15	60	-	40	-
Italy	15	35	38	27	-
Ireland	15	73	27	-	-

Source: OECD

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