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# Participation in Continuing Vocational Education and Training:

## Results from the Regional and Sectoral Surveys

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# Contents

# Introduction

The high importance of Continuing Vocational Education and Training (CVET) for the development of individuals and social, technological and economic development and economic competitiveness of European regions, European societies and the European Union is undisputed. Also the Lisbon Summit in 2000 has emphasized the fundamental role of training and education for the demands of a competitive and dynamic economy.

Continuing Vocational Education and Training can be seen as subsequent (training and learning) interventions, throughout active life, following initial education/training. It aims to improve active population's skills and competencies, widening knowledge of individuals and enlarging the breadth of selected activities or promoting specialisation at a specific level. In this way, CVET facilitates adult individuals to adapt to organisational, technical, and technological transformations of the present days. When initial training is characterised by a strong sector differentiation, CVET presents an even greater differentiation from sector to sector.

The development of the human society and its fast evolution leads to a high valuation of human resources and transforms "the concept of continuing education and training into a global project, with a common future, at a world scale, devising for Mankind education for life" (Esparteiro, 1999:63). In fact, in addition to "the basic professional training, workers must go on learning during the period of their professional life in order to maintain their competence. Professional training is recognised as a means to achieve such a competence" (Leitão, 1996:9). Therefore, participation in CVET should be considered "the centre of the theory and the practice in adult education" (Darkenwald and Merriam, 1982). In 1976, the UNESCO and the OECD ratified the "Recommendation on the Development of Adult Education", a document which was guided by three fundamental references: *Autonomy*, which refers to the fact that people are responsible for their own education; *Totality*, which, from a horizontal perspective, refers to the whole span of human life, and, from a vertical perspective, refers to the multiple areas of knowledge; and *Dialectics*, once it demands the integration of the educational processes of children, youngsters and adults, and also demands the interaction between reflection and praxis. In 1979, the UNESCO enforced new measures regarding professional training, in order to better deal with the problems posed by the economic, technological, and social changes and development.

In a society both knowledge-based and dynamic, in which knowledge and abilities are always in danger of becoming obsolete unless they are constantly renewed and updated, permanent involvement in CVET is increasingly becoming a necessity for the workforce. Hence the willingness and capacity of individuals to enhance their qualification continuously is nowadays indispensable as a foundation of successful social and economic development. Initial education and CVET play a crucial role in this process of "lifelong learning" in order to keep regions capable of innovation and learning, to promote the development of human resources and to meet the demands of a competitive economy. This rule applies particularly to the less developed regions in Europe where the majority of the people of working age have only a low level of qualification and where participation rates in measures of adult education and CVET tend to remain low.

The accurate promotion of participation in CVET and its acceptance among employees requires close investigation and identification of those factors which may determine or influence adults' participation in CVET activities. An understanding of these factors is crucial for the formulation of adequate and effective developmental policies and strategies directed at particular social groups. Furthermore, it is important both for the development of measures and tools for the improvement of certain occupational skills and competencies, and for the structuring and organisation of CVET systems in such a way as to adapt the supply of training programmes more closely to the demands and needs of the prospective customers. Finally, information on the influential factors in the domain of adult education could possibly make it easier for policy-makers to develop and implement strategies to make particular groups of employees aware of the necessity to participate continuously and systematically in processes of adult education.

That is, for promoting CVET more tightly focused by policy it is important to know the relevance of CVET in different European regions and states. Therefore it is necessary to identify the factors influencing CVET participation, that is to find out which factors support or constrict CVET participation. This is the key research question of the pilot project PARTICIPA[1] in which researcher of six European countries tries to find out the important factors and conditions of CVET participation of technical workers.

In the first State of the Art Report[2] the results of a bibliographic overview prepared by all partners involved in research on participation in CVET, the national frameworks of CVET, participation on CVET and adult education participation (AEP) and the state of the art of national research about CVET and AEP were personated.

In this second Report of the PARTICIPA research project we will publish the results of the quantitative studies of the partnership. The objective of the surveys which were accomplished in 2003 is to identify the factors influencing technical workers' CVET participation in Small and Medium Enterprises (SMEs). Subject of the studies are two sectors. The IT sector with its increasing importance in European economy and with its strong impact on other sectors was investigated by all partners and a second sector which varies between partners and depends on regional importance. The research results which are presented in this report refer to the regions: Bremen (Germany), Extremadura (Spain), Alentejo, Lisbon (Portugal), Athens (Greece), Lazio (Italy) and Coventry (United Kingdom).

To allow the comparableness of the research results of the pilot project partners we used a common research framework. Its nucleus is the ISSTAL-Model of Smith und Cookson. In the subsequent paragraphs we will briefly illustrate the model. A more detailed description of the theoretical background can be found in the Portuguese section of the present Report.

Adults' participation in training activities have been, more systematically, studied by Peter Cookson (USA) in a frame of the ISSTAL (*Interdisciplinary, Sequential-Specificity, Time-*

1 PARTICIPA (Participation in Vocational Education and Training: a need for a sustainable employability). See also the First Report ed. by Alan Brown, ITB-Arbeitspapiere Nr. 38, Bremen 2004

2 See, Brown, Alan (Ed.), ITB-Arbeitspapiere Nr.38, Bremen, 2004.

*Allocation, Lifespan*) model of social participation developed by Smith (Smith & Macaulay, 1980). This social participation model appears to offer a good conceptual framework for studying factors associated with active adults' participation in training activities (Cookson, 1986). It is the only model associating and interconnecting all the factors closely linked to the question of adult participation. The ISSTAL model brings in three characteristics of particular importance for researching adult participation in continuing education. First, it offers an interdisciplinary research frame; second, it introduces a chronological perspective of relationships among factors of diverse order and between them and participation; and, third, it gives a perspective of time distribution along with individual's life. That is to say that human behaviour may be determined and foreseen after the analysis of individual and environmental aspects, which may be identifiable and measurable. For those reasons, the ISSTAL model appeared to constitute an interesting and adequate research frame to study and understand active adults' participation in continuing education and training activities in the European regions, namely in Alentejo and Lisboa & Vale do Tejo regions (Portugal). The model postulates individual and discretionary adult behaviour resulting from a complex interaction among a set of predictive (independents) variables organised into six sets (Cookson, 1985): (1) *External context*, (2) *social background*, (3) *personality*, (4) *attitudinal dispositions*, (5) *retained information*, and (6) situational aspects (Fig 1). However, the study has also taken into consideration other aspects, such as the learning organisation and the organisational culture concepts, participation in organisation and knowledge as power in the workplace, the professional identity and the social and work values.

The variables adapted from Smith and Cookson for inclusion in the study are indicated in figure 1.

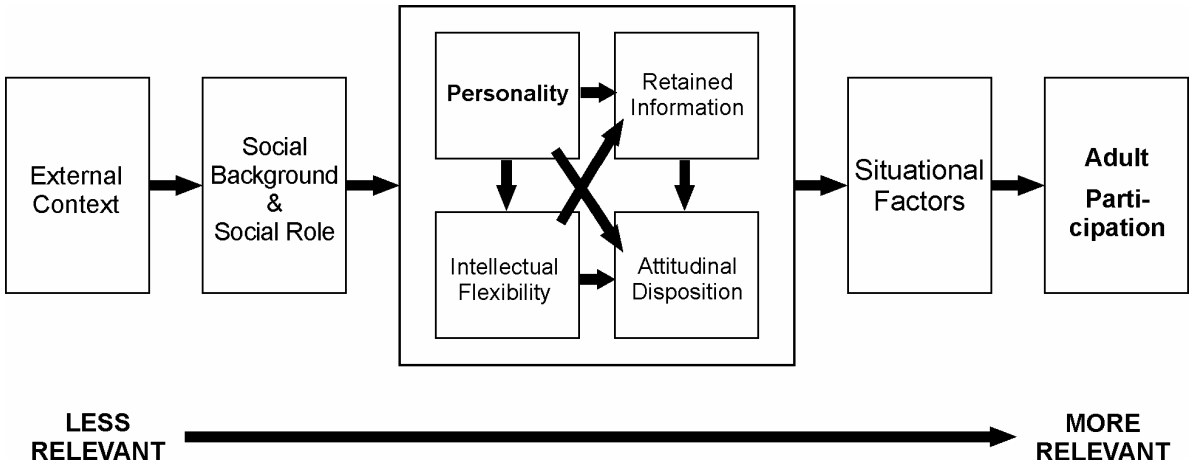


*Fig. 1 Model of adult participation in continuing education*
*Note: Adapted by Cookson (1986) from Smith's ISSTAL model (1980)*

**External Context** may be defined as a group of independent variables referring to the individual's external environment, which form "…an internal matrix in which social background, personality and attitude characteristics of individuals originate, develop and modify. In fact, internal individual characteristics derive their essence from social expectations, rules, structures, cultural models, human population and variables of the biophysical envi-

ronment comprehended in the category of contextual characteristics." (Smith and Reddy (1972), cited by Gonçalves, 1996:67).

**Social Background and Social Roles** find correspondence in five types of the individuals' socio-demographic characteristics: (1) physical and physiological aspects, (2) attributed social positions and their roles, (3) acquired social positions and their roles, (4) experience and activities, and (5) resources and access to resources. Together these components provide the constitution of behaviour models and experience leading to distinct perceptions of the knowledge of the world.

**Personality and Intellectual Flexibility** constitutes the third class of independent variables. Personality is a group of inherent mental characteristics which, despite the fact that they may undergo some changes, tend to resist circumstantial and temporal shifts. "These characteristics encompass the individual dispositions of permanent character, such as thinking, feeling, wanting and acting in a certain way, to the disregard of other attitudes, depending on circumstances." (Gonçalves, 1996:68). Personality is constituted by important factors that are associated with different modes of social participation, such as extroversion, ego, inner strength, self-confidence, efficiency degree, energetic performance, and stimulation. Intellectual Flexibility includes dimensions concerned with intellectual capacities of individuals.

**Attitudinal Dispositions** encompass internal psychological characteristics, transactional and lasting for less time when compared to personality and intellectual capacity. In comprehending values, attitudes, expectations and intentions, these variables are involved in a dynamic interaction with personality characteristics and intellectual capacity, thereby contributing to the individual's motivation.

**Retained Information** refers to the individual's 'continuous life', enabling a significant increase in secure and lasting information, stored in the memory in the form of symbolic and non-symbolic images. The purpose of these variables is to store and recover information, contrasting with the variables of the first two classes, which process and interpret information. The variables integrated in this class are images, beliefs, knowledge, and plans.

**Situational Variables** are the factors and aspects which lie closer to voluntary human behaviour, i.e., those aspects that they wield the most immediate effects on Participation in Adult Education. This set of variables leads to complex and interactive effects on all the other sets of prior and lasting variables of the ISSTAL model that influence an individual's participation in Adult Education.

Besides aggregating all the variables previously described, this model includes three fundamental aspects: *(1) Interdisciplinary Conceptual Framework*, a perspective which includes concepts and interrelations articulated in the domains of Physiology, Anthropology, Political Science, Sociology, Social Psychology and Adult Education, contradicting the previously integrated idea that the domain of Psychology held the monopoly of definitions for this area; *(2) Sequential Specificity of Relations,* the six classes of independent variables contained in this model are causally interrelated. With the exception of situational variables, all of them influence the dependent variable Participation in Adult Education (PAE) through one or more of the intervening variables. Therefore, the more to the left a variable is placed in the

relevance scale, the higher will be the probability of their effects beings mediated by subsequent and consequent variables. In contrast, the more to the right a variable is placed in the referred scale, the more specific is its role and situation in PAE; and *(3) Time-Allocation, Life-Span Perspective*, that is, PAE is understood as an enlarged part of the model of behaviour of social participation, since it is seen as a demonstration of synchronic and diachronic co-variations, meaning that it is not only individual participation that has implications on other kinds of social activity. The 'Life-Span' aspect postulates that social participation (including PAE) tends to be suited in long-lasting models, in order to enable diachronic covariation. Consequently, a person who, at thirty years of age, has reached a high degree of Participation in Adult Education is not likely to have diminished such participation when he or she reaches fifty or sixty. The reverse is equally important: a person who has had a low degree of Participation in Adult Education from a very young age is likely not to alter his or her degree of participation in the course of time.

The different reseach reports on participation in CVET in this Second Report are carried out by each of the project partners. These reports of the partners are related more or less closely to the theoretical framework of the ISSTAL model. Especially the Portuguese and Spanish partners surveys are closely related on the ISSTAL model. Therefore it was reasonable to produce separate and less related reports.

Consequently, the document has been divided into six separate national reports and the final remarks.

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[5] This in fact indicates that apprenticeship training seems to be cost-neutral or even beneficial/productive. However, expert interviews point to considerable differences between the four IT occupations and the new occupations form the media, print and graphics field.

# 1 Germany

*Philipp Grollmann, oland Tutschner, Peter Kaune, Wolfgang Wittig*

## *Results of the Survey among Technical Workers in the IT and Aeronautics Sector in the Bremen Region*

This report describes the data collection, the descriptive and the analytical results of the standardised surveys carried out within the EU Commission 5th Framework Project PARTICIPA. In PARTICIPA we are investigating the determinants and factors of participation of technical workers in CVET the IT sector and in the aeronautic sector in the Bremen region. The standardised survey we are presenting here was being carried out in both sectors with slightly adapted questionnaires. In addition to this survey we carried out several expert interviews which were beside the literature review the basis of the research questions to be investigated with our questionnaire. The questionnaire therefore is a blend of the questionnaire used in the Portuguese, Spanish and Greek setting focusing mainly on the ISSTAL model and some items which are directly derived from the state of the art of research on CVET Participation in the German setting and some particular features of the respective sector. First, we will give some general information on the sectors in general and in Bremen. Then, we will provide some general information on the population of the standardised survey. Some descriptive and analytical results will be presented on the measurement of CVET participation and some factors contributing to it. Then, some findings on informal learning and problem solving will be presented as well as correlations between selected variables. Finally, some conclusions will be drawn with regard to ISSTAL and some remaining analytical and research questions.

## *1.1 The IT sector*

### 1.1.1 General situation of the IT sector

Whilst the overall share of the IT sector to the GNP is only 5 per cent (Falk, 2002), there has been intensive public debates about the lack of skilled work on the IT labour market, which finally led to the introduction of the "green card" for IT specialists from non European countries. At the moment the tense situation on this labour market is compensated to some extent by the weak economic performance of the IT sector itself as well as by the general economic situation. The tables show the development of the IT industry over the last three years and projects a small increase of turnover for 2003. However, the table shows that at the moment there is rather a consolidation than a further expansion of this industry and that turnover drops. The lines of business that are most strongly affected are hardware, software development and IT services. Although BITKOM blames the UMTS (G3) auctions and the high prices of the licences for the crisis of the sector, only telecommunication-services can expect increases in their turnover (BITKOM, 2002b). BITKOM expects the IT industry to reduce the number of employees from 819,000 to 791,000 in 2002.

| ITK-Markt Deutschland | Marktvolumen (in Mrd. Euro) 1999 | 2000 | 2001 | 2002 | 2003 | Wachstumsraten 00/99 | 01/00 | 02/01 | 03/02 |
|---|---|---|---|---|---|---|---|---|---|
| **Summe ITK** | **121,3** | **135,6** | **137,9** | **136,1** | **136,5** | **11,8%** | **1,7%** | **-1,3%** | **0,4%** |
| **Summe Informationstechnik**[1] | **66,8** | **73,8** | **74,0** | **71,5** | **70,3** | **10,5%** | **0,3%** | **-3,4%** | **-1,7%** |
| **Summe Telekommunikation**[2] | **54,5** | **61,8** | **63,9** | **64,5** | **66,2** | **13,4%** | **3,4%** | **1,1%** | **2,6%** |
| **Summe ITK Hardware u. Systeme**[3] | **41,7** | **46,6** | **42,5** | **38,1** | **36,1** | **11,9%** | **-8,8%** | **-10,3%** | **-5,3%** |
| Computer Hardware | 23,6 | 25,0 | 22,4 | 20,3 | 19,4 | 5,9% | -10,2% | -9,5% | -4,5% |
| TK-Endgeräte | 6,5 | 8,2 | 6,1 | 5,5 | 5,0 | 25,6% | -25,1% | -9,8% | -8,9% |
| Bürotechnik | 2,4 | 2,5 | 2,5 | 2,4 | 2,2 | 5,3% | 0,5% | -5,9% | -5,0% |
| Datenkommunikations- u. Netzinfrastruktur | 9,2 | 11,0 | 11,5 | 10,0 | 9,5 | 19,6% | 4,3% | -13,3% | -4,9% |
| **Software** | **12,6** | **14,4** | **15,2** | **15,1** | **15,1** | **14,2%** | **5,4%** | **-0,8%** | **-0,3%** |
| **IT-Services** | **25,1** | **28,0** | **29,3** | **29,2** | **29,1** | **11,5%** | **4,7%** | **-0,3%** | **-0,3%** |
| **Telekommunikationsdienste**[4] | **41,9** | **46,5** | **50,9** | **53,6** | **56,2** | **11,1%** | **9,3%** | **5,5%** | **4,8%** |

[1] Computer Hardware, Bürotechnik, Datenkommunikationshardware, Software, IT-Services
[2] TK-Endgeräte, Netzinfrastruktur, Telekommunikationsdienste
[3] Computer Hardware, TK-Endgeräte, Bürotechnik, Datenkommunikations- u. Netzinfrastruktur
[4] ohne Carrier-to-Carrier Geschäft

*Tab. 1 Turnover of the German IT and telecommunication industry according to its association BITKOM (BITKOM, 2002a)*

However, labour market specialists project an increased demand for IT specialists in the long run, since the biggest employer for IT skilled work is not the sector itself, but other industries, such as financial and insurance services. Over 2/3 of IT specialists are employed by non IT companies (Falk, 2002). Financial services are the industry which is affected by the lack of skilled IT staff the most. Their current employment policy is to fill those gaps at 80 per cent with staff having an academic degree, not necessarily directly related to information technology. It is rather the actual skills of the candidates that industry looks for (Falk, 2002). The main strategies of those enterprises not part of the IT industry itself to cope with the lack of IT specialists at the moment is overtime work, employing freelancers and outsourcing of IT services. The establishment of IT related apprenticeships are the last important measure those employers take at this moment as data suggests. However, there is a slight trend that this might change in the future as soon as the new IT occupation s (see below) are fully established and accepted.

### 1.1.2 What is the IT sector – who works there?

It is not an easy task to actually determine what the IT sector comprises and where the boundaries to other sectors are. Basically a 'field-of-employment' and an 'area-of-economic-activity-view' can be distinguished.

A study on the "informatisation" of work carried out by the research institute of the federal agency for employment (Institut für Arbeitsmarkt- und Berufsforschung der Bundanstalt für Arbeit) made the following distinctions and came to the following numbers (Dostal, 2000): in 1998/99 51% of the workforce is using the computer as a tool in their work, however, it is only 9.3% of all employees which is active in the wider field of computers, system maintenance, user consultation and support and only 1.2% of all employees define their work as a pure "computer-occupation". Hence, taking the 'field-of-employment-view'

it is 9.3% of the workforce working in the IT sector. Taking the 'area-of-economic-activity-view' the BITKOM classification and delimitation distinguishes between the following lines of business:

– Hardware and Systems (computer and telecommunication hardware and devices, office technology, and data and IT infrastructure);
– Software;
– IT services and
– Telecommunication.

The classification of the OECD for example is much broader and also includes other lines of business, such as the production of cables or the manufacturing of radio and television appliances. The classification of the German federal agency for statistics looks as follows: production and manufacturing of data processing systems and devices, software development, software consultation, data entry and, data processing and archiving, telecommunication services to end-users, other data processing services, databases, IT maintenance, information broking and data processing related activities. Other German industry associations as for example Bremen Multimedial (see below) integrate the IT sector and the multimedia business indicating the difficulties of finding an appropriate criterion to distinguish from the media, graphics, design and print industry. All this shows how blurring the boundaries are, as far as the IT sector is concerned. The dynamics of the sector can be illustrated by some more figures: in a survey on vacancies in the IT sector it was shown that 80 per cent where new jobs, whereas only 20 per cent where due to the need for substitution caused by retirement or other reasons. Especially SMEs claim long search periods for finding appropriate personnel (Falk, 2002).

| | Vacancies | | New Employment | |
|---|---|---|---|---|
| | ICT-Sector | Non ICT | ICT-Sector | Non ICT |
| master and higher | 48 | 42 | 39 | 37 |
| polytechnics (baccalaureat) | 36 | 37 | 33 | 32 |
| master (craft), technicians level | 6 | 11 | 11 | 12 |
| dual system | 9 | 7 | 13 | 16 |
| without qualification | 2 | 2 | 4 | 3 |

*Tab. 2 Vacancies and New Employment in the IT sector*
*only enterprises with vacancies for IT specialists are included*

The table shows that around 80 per cent of the IT specialists sought for by industry are drawn from the field of graduates with academic degrees. The same study points out that about 60-70 per cent of the enterprises do not seek specific IT related degrees. Fluctuation in the ICT sector is extremely high in some areas, such as financial and insurance services or software development (100 per cent higher than average) whereas in others it is just as the average fluctuation of the overall workforce (Falk, 2002).

### 1.1.3 Education and training in the IT sector

#### Initial vocational education

Willi Petersen and Carsten Wehmeyer estimate the overall supply of apprenticeship training vacancies and study places at schools, polytechnics and universities with 190,000 (2001), 40,000 of which are in the field of the four new IT occupations.

Since 1997 there are four new dual-system occupations in the IT sector:

– IT system electronics technician;
– IT system trader;
– Information specialist;
– Information trader.

According to Petersen and Wehmeyer after some reorganisations of occupational profiles there are five more IT related occupations on this level: telecommunications systems technician, telecommunication technician, information electronics technician, micro-technologist, and mathematical-technical assistant. In addition there are several courses of study at the Universities and Fachhochschulen.

Generally speaking, the new IT occupation s are regarded as a success as the evaluation study of the Federal Institute for Vocational Education (BIBB) and the Berufsbildungsinstitut Arbeit und Technik, Uni Flensburg (biat) suggests (Petersen & Wehmeyer, 2001). The study indicates that a part of the jobs which was formerly filled with academic graduates might be substituted with dual system skilled workers in the future (also Falk, 2002). Some of the older occupations, such as the communication electronics technician or the data businessman are substituted more and more by the new occupations. Criticism rose to some extent concerning the delimitation of the occupations, especially with regard to the two different possibilities of specialisation, each of the occupation offers. The original design of the IT occupation s was based on the assumption that there are typical IT supply occupations and IT demand occupations, but in fact the actual demand and acceptance of the IT occupations shows that the Human Resources Needs are not determined by the accountability of the respective training enterprise to supply or demand but rather through lines of business and work-processes. Especially in SMEs the issue of a comprehensive supply of training tasks according to the training regulations is a critical issue. Some enterprises react on this by rotating employees, as for example in the Bremen region (Handelskammer Bremen & Bremen Multimedial, 2001).

#### Continuing vocational education

As shown in the state of the art of report on research and participation in CVT activities in the IT sector, a new system of IT-CVT – intended to connect seamlessly to the initial occupations – is ready for implementation. There are no experiences yet, since it was only launched this year by the respective stakeholders. However, different expert opinions came up during our sector expert interviews: one aspect of the critique is that the new specialist occupations are not directed to the needs of SMEs and work-processes. Another regional expert sees the function of those specialist occupations mainly in the accreditation of prior learning for those who did not directly enter the sector by either of its training occupations

or a relevant academic degree. In the period from 1998-2000, in which there was the peak of the lack of skilled work in the IT sector, continuing education and training was one of the predominant strategies beside overtime work (Falk, 2002).

### 1.1.4 The Bremen IT and Multimedia Sector

Precise data on the structure, size and development of the IT sector is scarce. The most recent data on the IT sector in Bremen (that usually covers Bremen and Bremerhaven) is based on a survey and a projection of existing data of the chamber of commerce and the association of the Bremen IT and Multimedia industry, Bremen Multimedial from the beginning of 2001 (Handelskammer Bremen & Bremen Multimedial, 2001). Because of the specific Bremen structure of relevant stakeholders and associations IT is usually mentioned in one breath with the multimedia industry (Dorn & Wupperman, 2001).

Since IT and Multimedia are a very dynamic sector of the activities with concurrently new emerging areas of activities and others disappearing it is hardly possible to totally be up-to-date. In addition the delimitation of the "IT sector" is very difficult, since there are overlaps with several other industries, such as telecommunication or graphics and design, as shown above.

| Business field | Number of companies |
|---|---|
| Production manufacturing of hardware | 4 |
| Hardware consulting and installation | 20 |
| Software consulting | 25 |
| Software development | 55 |
| Data collection and filing | 3 |
| Dataprocessing | 4 |
| Provision of telecommunication infrastructure | 17 |
| Other data processing | 26 |
| Databases | 5 |
| IT maintenance | 2 |
| Data processing related | 25 |
| IT-/Multimedia (not specified) | 76 |
| | 262 |

*Tab. 3 IT enterprises in the Bremen area from a classified business directory according to the classification of the Federal agency for statistics*

In preparation for the questionnaire survey we have gathered addresses of IT SMEs (all companies under 500 employees) in the Bremen region from a classified directory of enterprises of the Bremen area and have sorted them according to the classification of the federal agency of statistics (see tab. 3).

This resulted in a collection of addresses of 262 SMEs from the Bremen area. However, according to data of Bremen Multimedial and the Chamber of commerce there are 600 enterprises altogether in the Bremen IT sector, of which there are around 290 enterprises which can be found in the trade register (indicating that they are bigger in size and turnover) and 300 which are few-persons small scale industries (micro-enterprises) not indicated in the general trade register (Handelskammer Bremen & Bremen Multimedial, 2001). The

290 bigger enterprises are estimated to employ around 6100 employees and have an average of between 20- 24 employees per enterprise. The remaining small scale "micro-enterprises" only have 1 to 2 persons employed resulting in 400 people working in IT micro-enterprises. Hence, altogether the number of employees in the Bremen region IT sector is estimated with about 6,500.

Based on the results of 189 bigger enterprises surveyed, the IT sector expected an increase of 16 per cent at the beginning of 2001 resulting in an estimated number of employees of 7,550 for the end of 2001. The number of apprenticeship-trainees is estimated with 338 at the beginning of 2001 and was expected to increase to 450 for the end of 2001.

**More recent material**

In fact employment in the Bremen IT sector decreased by 10 per cent (Bremen Multimedial, 2002) Bremen Multimedial found out based on a members' survey (see Figure 4). Whilst employment decreased the number of dual system apprentices in the Bremen IT sector rose by 2 per cent[5]. This indicates that the new IT occupation s are integrated into the HRD-policy of the enterprises, as Bremen Multimedial interpretes this data. The training policy of the Bremen Multimedia Sector is accompanied by an agency funded through ESF stimulating the establishment of apprenticeships, training partnerships and more recently also the use of the new IT continuing education system in the IT and multimedia sector.

| 2000 | | | 2001 | | | End of 2002 (projected by enterprises) | | |
|---|---|---|---|---|---|---|---|---|
| Employees | Freelancers | Trainees | Employees | Freelancers | Trainees | Employees | Freelancers | Trainees |
| 1561 | 498 | 111 | 1409 | 282 | 118 | 1564 | 328 | 120 |
| Compared to previous year | | | -10% | -43% | +6% | +11% | +16% | +2% |

*Tab. 4 Employees, freelancers and apprentices at member enterprises of Bremen Multimedial (Bremen Multimedial, 2002)*

### 1.1.5 Some conclusions on Bremen's IT sector

In this first glance on the IT sector in Germany and more specifically in Bremen the dynamics of this sector are presented and it is shown that it is difficult to demarcate it from other domains such as graphics and design or electronics technology. Especially in the last year there were considerable slumps in turnover leading to the dismissal of employees as well as in reduced need for IT specialists. Labour market experts however expect a persisting lack of IT specialists over the next years especially caused by the need arising from non-IT companies such as insurance and financial services. It is not clear, yet, how those gaps will be filled and if enterprises will stuck with their current coping strategies such as overtime work and continuing education or if there is a gradual shift to filling those gaps though training in the new IT occupation s on the middle-level and recruiting from the pool of academic graduates for higher-level positions. In the course of the sectoral expert interviews we are currently conducting it seems, as if the whole sector moves towards some ease and adopts more and more traditional strategies such as apprenticeship training.

CVET participation of technical workers in SMEs is at the core of our investigation (companies with up 500 employees). In recent informal survey Industrie- und Handelskammer Bremen and Bremen Multimedial counted about 600 enterprises in the IT and Multimedia sector, the boundaries between the two are to some extent blurring. 290 of them were officially registered, the rest is mainly micro-enterprises of one to three persons. In those 290 enterprises there are working about 6,100 people. The average size of companies is between 20 and 24 employees. Based on estimations there is an additional 400 employees working in non-registered micro-enterprises. Therefore, the whole population of technical workers in the IT- and multimedia sector can be estimated at 6,500. There is no more precise data, such as according to the classification of BITKOM. In our standardised survey, there were participating 134 skilled IT workers mainly from the Bremen region (see Bremen Multimedial, 2002; Grollmann, Kaune, Tutschner, 2003; Handelskammer Bremen & Bremen Multimedial, 2001).

### *1.2 The Aeronautics-Sector in Bremen*

"City of Aeronautics" – With this description, Bremen welcomes its guests at the airport. Not only this self-description, but also the efforts of city and state in order to strengthen the aeronautics sector in Bremen document the expectations which are related to this area. A good example for these efforts is shown by the "Space Park". This multi-million-Euro project by private investors and the city of Bremen mainly has been carried out in order to attract tourists to Bremen. However, the choice of Bremen as the location for the "Space Park" certainly was influenced by the rather strong standing of this sector in the city and by Bremen's self-estimation as "City of Aeronautics". Aeronautics is also an important issue at universities in Bremen. The Hochschule Bremen (University of Applied Science) offers an "International Degree Course in Aviation Systems Engineering and Management". The University of Bremen hosts the Centre of Applied Space Technology and Microgravity (ZARM), a scientific institute which research is concentrated on the investigation of fluid mechanics phenomena in particular under microgravity conditions and questions related to space technology. The Drop Tower Bremen provides 4.74 seconds of weightlessness in an earthbound laboratory. Two companies have been founded so far by the ZARM. Even though the importance of the aeronautics sector for Bremen is proofed by the above mentioned facts, it is rather difficult to identify companies in this sector, since a majority of them is working in several fields. So far, we have been able to identify 34 companies operating in aeronautics in Bremen. This includes four big companies and 30 small and medium enterprises. We expect that further investigations will show several other companies operating in aeronautics. There is a much bigger diversity in aeronautics than in many other sectors. The scope of products and services is very broad. Within the companies in the Bremen region, the area of operation includes for example:

– construction of wings for the airbus,
– maintenance of airplanes,
– development or transportation of satellites,
– development and construction of carrier systems for satellites,
– micro-gravitation-technology,

– space technology, fluid physics and combustion,
– development of simulation systems and other software,
– flight training,
– mechanical engineering.

Regionally the aeronautics sector is dominated by three of the four big companies and by several companies surrounding the airport on one hand and by the technology park Bremen surrounding the University on the other hand. Unfortunately, the number of employees in this sector could not be determined so far.

### 1.2.1 Vocational Education and Training (VET) in the Aeronautics-Sector

Due to the high diversity in this sector is difficult to identify vocational profiles belonging solely to aeronautics. This can be stated only for two technical occupations within the dual-system:

– the Aircraft Electronics Technician (Fluggeräteelektroniker/-in),
– the Aircraft Mechanic (Fluggerätemechaniker/-in) with its three specializations engine technology (Triebwerkstechnik), aircraft maintenance (Instandhaltungstechnik) and aircraft construction (Fertigungstechnik).

In addition there is one occupational profile in business and administration which does belong to this sector:

– service businessman in air traffic (Servicekaufmann im Luftverkehr).

Due to the outline of the PARTICIPA project, further investigation on this occupation has not been undertaken.

In 2000, there have been 264 apprentices in aircraft electronics and 2.047 in aircraft mechanics in Germany. 74 Aircraft Electronic Technicians and 618 Aircraft Mechanics started their initial vocational education in 2000. Apprentices in aeronautics come from three different types of general schools and from vocational schools. Tab. 5 shows the different qualification of new apprentices in 2000.

In order to gain knowledge about continuing vocational education and training, further research is necessary. The PARTICIPA project certainly will help to get a better understanding of CVET in aeronautics.

Companies in the aeronautics-sector in Bremen play an important role in terms of initial vocational education and training in the region. At least nine out of the 34 companies in this sector offer apprenticeships within the dual system. In Bremen, apprenticeships are offered for:

– the Aircraft Electronics Technician,
– the Aircraft Mechanic with the specializations aircraft maintenance and aircraft construction,
– and the service businessman in air traffic.

| Degree at General or Vocational School[6] | Aircraft Electronic Technician | | Aircraft Mechanic | |
|---|---|---|---|---|
| Without school degree | 0 | 0 % | 0 | 0 % |
| Hauptschlabschluss | 5 | 7 % | 109 | 18 % |
| Realschulabschluss | 50 | 68 % | 373 | 60 % |
| Hochschulreife | 16 | 22 % | 93 | 15 % |
| Berufsgrundbildungsjahr | 0 | 0 % | 6 | 1 % |
| Berufsfachschule | 2 | 3 % | 26 | 4 % |
| Others | 1 | 1 % | 11 | 2 % |
| Total | 74 | 100 % | 618 | 100 % |

*Tab. 5 Educational Degrees of technical workers in the aeronautics occupations*

However, the companies do not only offer apprenticeships in occupations directly related to the aeronautics-sector but also in another eleven occupations. Three of them belong to business and administration, two of them rather belong to the IT sector, and six are in construction. Most of these occupations are offered in three of the big companies. One leading company does also offers further education towards three different bachelor degrees (Fachhochschulabschlüsse):

– electrical engineering
– mechanical engineering
– business administration.

Similar to the situation in Germany, we have got no information on CVET in the regional aeronautics-sector.

## *1.3 The Survey*

### 1.3.1 IT sample

The survey was being carried out between 1st of August 2003 to 1st of November 2003. The main catchment area was Bremen, some SMEs in Oldenburg and Hamburg have been approached in addition. 10 per cent of those who have provided their postal code on the questionnaire do not come from the Bremen or northern German area. The survey was carried out with an online questionnaire after it came apparent during the pre-test that the kind of instrument was especially suited to the needs of our respondents.

Altogether 134 technical workers participated in our survey, 22 of them female. 38.7% of the responders live in a partnership, 31.5% are married, 26.6% are singles and 3.2% live separated (n=124).

[6] It is difficult to find an appropriate translation for the different types of school. In Germany there are three different types of general schools, starting with either the fifth or the seventh year of school education – depending on the state. Hauptschule (usually nine or ten years of school attendance) the lowest level, Realschule (usually ten years of attendance) medium level and Gymnasium (usually thirteen years of attendance) is the highest level. In addition there are vocational schools, which often follow after Haupt- or Realschule and take another year (Berufsvorbereitungsjahr) or more (Berufsfachschule).

On average respondents are 33 years old, the biggest group of them are the 21-30 years old with a share of 39.2 per cent (see Figure ). 37.6% of the respondents are 31-40 years old. Only 2.4 % are under 20 years old and 3.2 % older than 50 years.

We were especially focussing on enterprises with up to 500 employees. However we did not exclude respondents from bigger sized enterprises since we hope for contrastive results with regard to CVET participation. As can be seen in the graph below the biggest share of respondents come from SMEs with up to 500 Employees (66.4%) and about one third form bigger-sized enterprises with more than 500 employees.

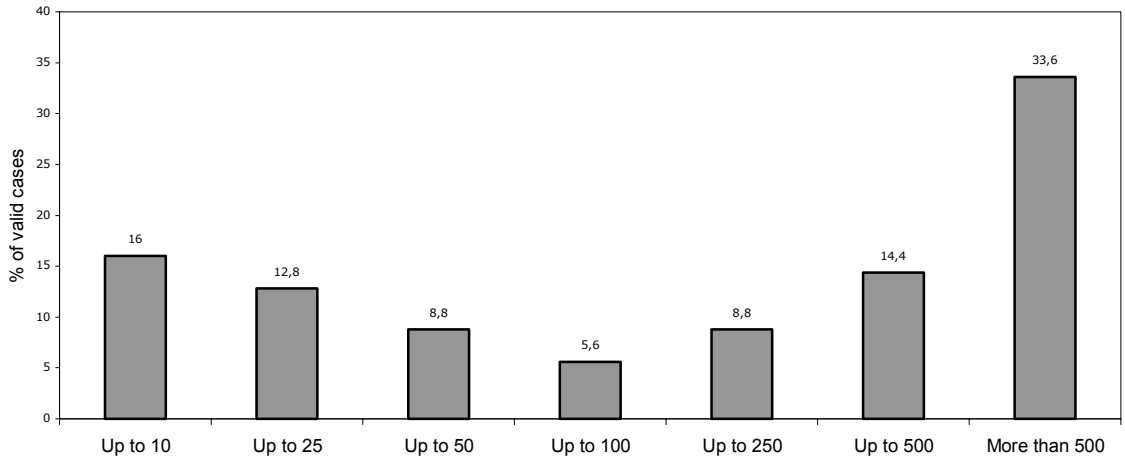


*Fig. 1 Respondents by size of enterprises in the IT sector*

Almost 80 per cent of the respondents work in the private sector, 16 per cent in public services and 4 per cent in the non-profit sector (n= 123).

73% (91, n=125) of the respondents have completed a vocational education programme and therefore represent the ideal type of a technical worker in the IT sector. However, some have obtained additional higher or further education degrees or certificates. 70 (54.3%) of the respondents hold the Abitur, 24 (18.6%) Fachabitur 22, (17%) hold a Fachhochschulabschluss (polytechnic, equivalent to a three years B.A.) in a technical field and 17 % hold a M.A of higher degree (n=129; see Fig. 2).

79.5% (101) categorise themselves as employees, 10.2% (13) are self-employed, 6.3% (8) are freelancers and 3.9% (5) employ people (n=125). 7.9% (10) of the respondents are still students, 3.1% (4) are unemployed and 7.1% (9) did choose the category others.

While 76% (82) of the respondents work on unlimited contracts, 24% (26, n=108) work under limited contracts. The average weekly working time is being estimated with 40.25h (n=99). 85.0%(51) work on a full-time basis and 15.0% (9) on a part-time basis. The average full-time weekly working hours is 42h and the average part-time working hours is 22 h (n=57).

The average monthly net-income is between 1,500 and 2,000 Euro (see Fig. 3).

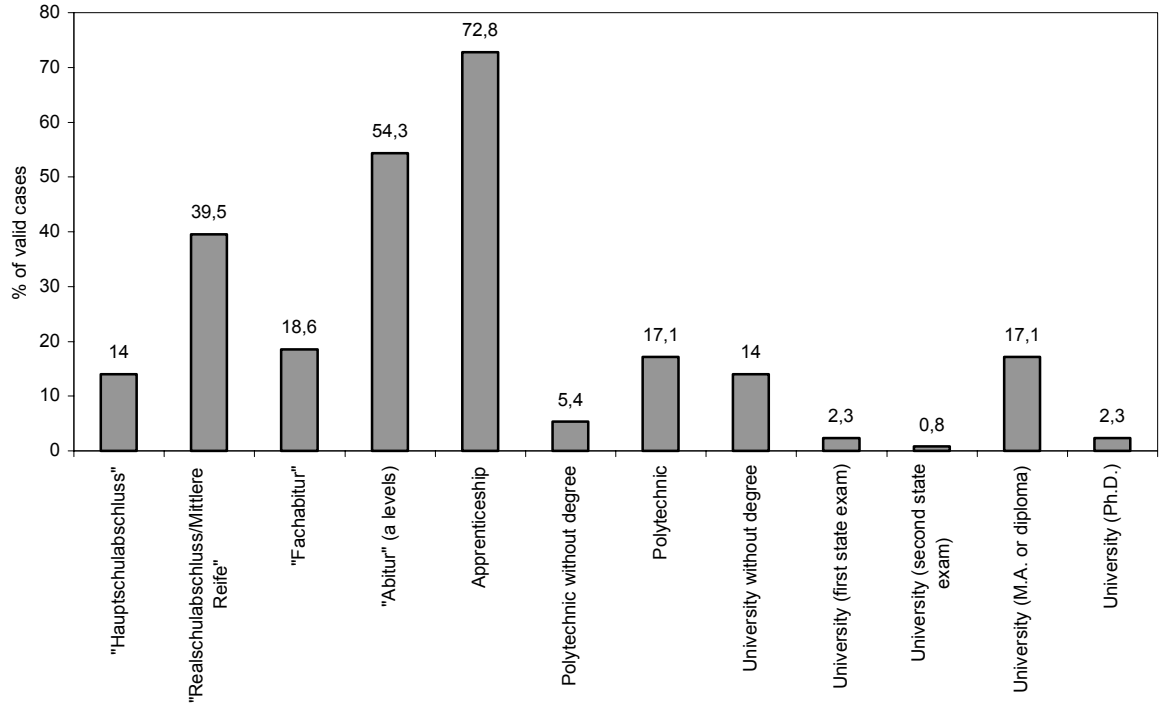


*Fig. 2 Educational degrees and vocational education in the IT sector*

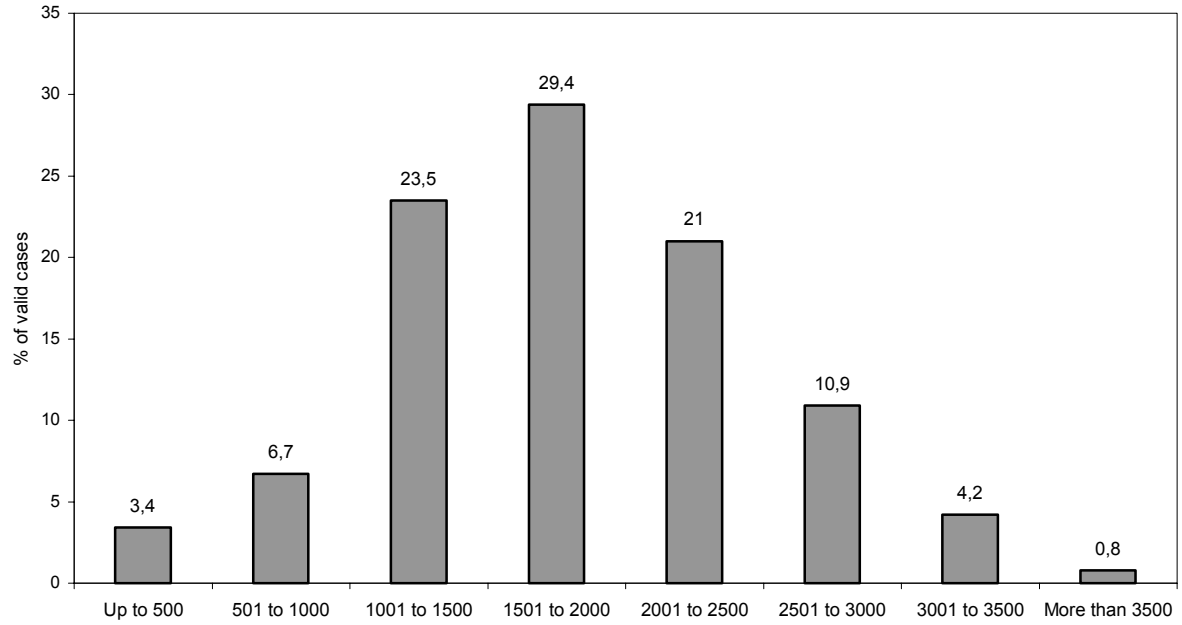


*Fig. 3 Monthly net-income in the IT sector*

Most of the respondents categorise themselves as working in the fields development/programming (39.7%) or maintenance (31.7%). With 9.5% consultation is the field which was mentioned third often (see Fig. 4).

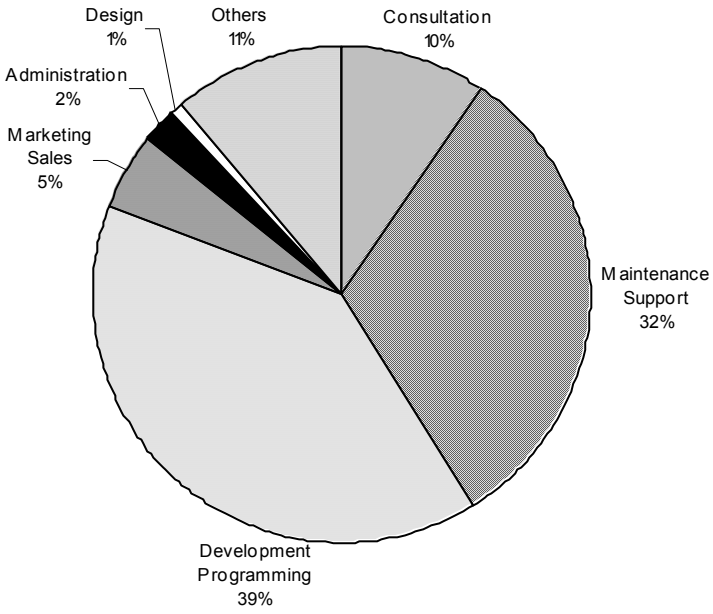


*Fig. 4 Major occupational tasks in the IT sector*

This result goes in line with the respondents mentioning "Systems administration" and "Programming and Development" as the major fields in which they see their professional qualifications and skills.

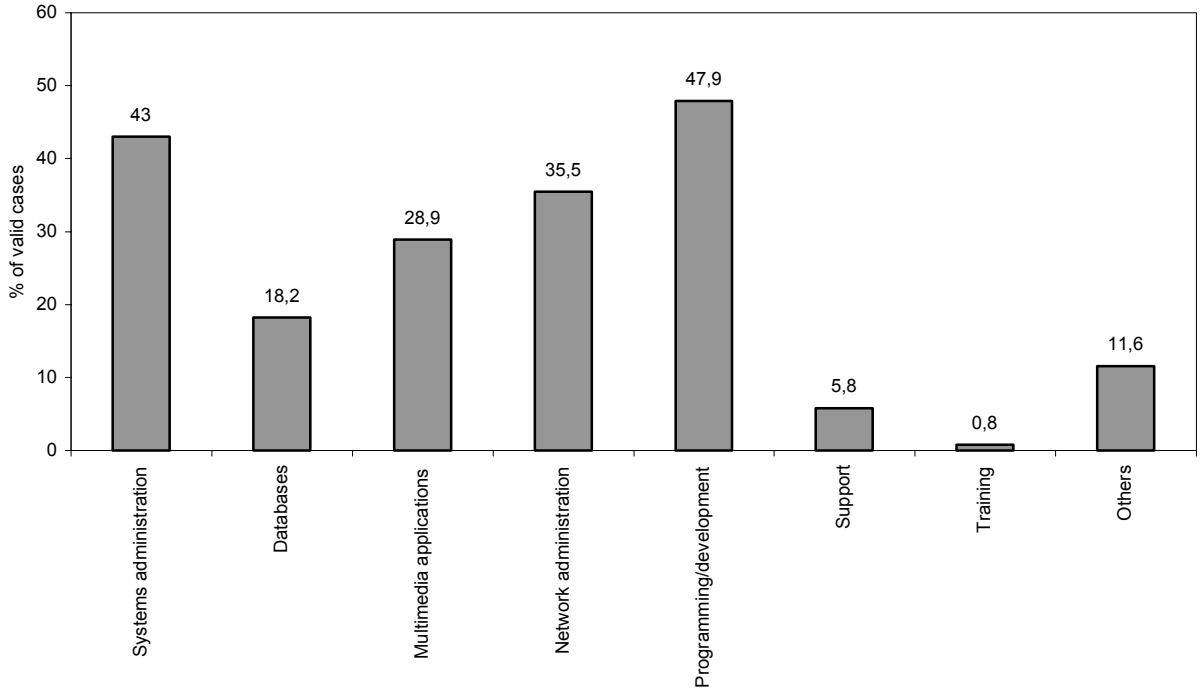


*Fig. 5 Professional skills and qualifications in the IT sector*

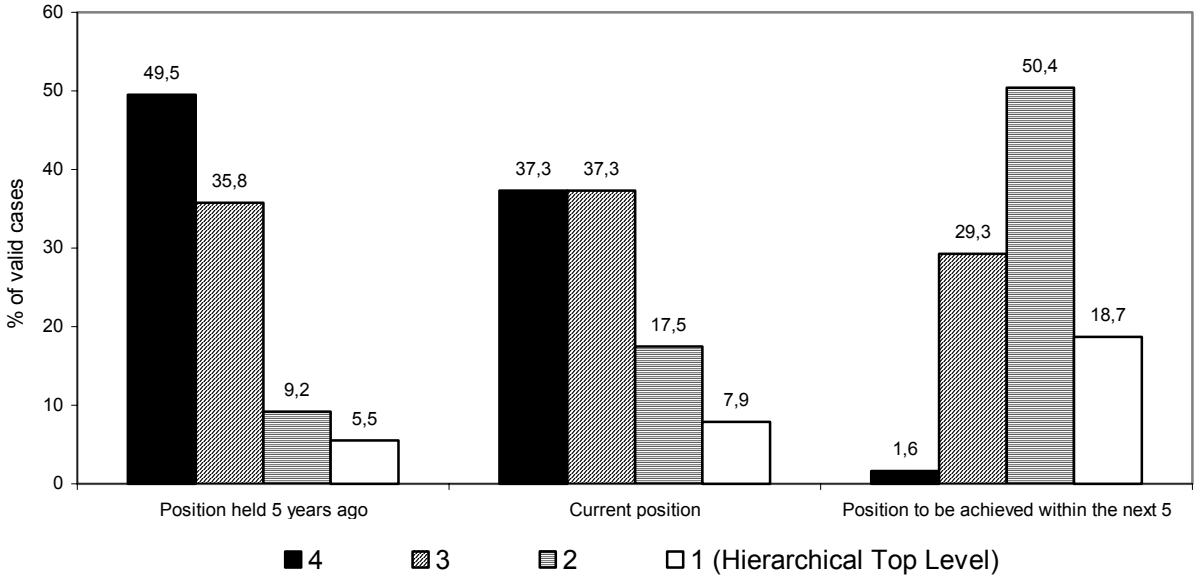


*Fig. 6 Advancement orientation of respondents in the IT sector*

It is revealing to compare the actual positions of the respondents with their aspiration for higher ranked jobs in the vertical position of their companies. While the majority of respondents rate themselves belonging to the third or fourth level within the companies' hierarchy, Figure 12 illustrates the strong advancement orientation of the population.

This implies that in terms of the new system of IT qualifications there is a strong demand for level 2 qualifications on the specialist level.

### 1.3.2 The aeronautics sample

The survey has been conducted between 1 December 2003 and 31 January 2004 in two enterprises in the Bremen region. Unlike in the IT sector this survey was carried out by means of a "traditional" paper questionnaire since we did not expect many of the prospective respondents to be familiar enough with online surveys.

On the whole, 18 employees of the two enterprises participated in the survey. As regards some of their basic characteristics such as age, civil status and educational background, the respondents differ remarkably from their counterparts in the IT sector. All of them are male and are in possession of German citizenship. The age distribution ranges from 27 to 64 years with an average of 45.6 years. 7 respondents are 51-60 years old, 5 are 31-40years old. Three respondents are between 41 and 50, 2 are under thirty and one is over sixty years old. It was our intention to approach at least twice as much respondents, but the biggest enterprise (about 100 technicians in the maintenance area) we had established contacts to, fell into an economic crisis.

The vast majority of respondents are either married (n=13) or living in partnership (n=2). The largest group among them have two children (n=9) while in most other cases the number of children ranges from 1 to 4. Two of the respondents do not have children.

Differences between the two sectors become particularly obvious with respect to the respondents' educational attainments as well as their social background. Most respondents come from families whose socio-economic status in terms of educational qualification and type of work appears to have been relatively low. Employing a rather traditional model of social stratification, one would have to conclude that the sample consists predominantly of quite typical members of the working class, an assertion which is supported by the responses regarding the respective levels of qualification of the respondents' parents and moreover of the respondents themselves. With respect to the former, the *Hauptschulabschluss* was the educational degree most frequently indicated both for the father (n=9) and for the mother (n=8), although some of the respondents' parents have obtained higher degrees. Among the fathers' occupations there is a high proportion of skilled manual and technical labour while most of the mothers (n=11) were labelled as housewives.

For the respondents themselves either the *Hauptschulabschluss* (n=8) or the *Realschulabschluss* (n=9) is the highest educational degree (see chart 2). None of them holds an *Abitur* or a *Fachabitur*. Nevertheless, two participants also declare that they either hold a *Fachhochschulabschluss* (degree awarded by a polytechnic) or, respectively, have attended a polytechnic without obtaining a degree. It is therefore not quite clear whether the respondents have actually understood the request in the questionnaire to indicate *all* degrees and qualifications. All respondents have completed a vocational education programme within the German dual system. Among these the vocational qualification most frequently stated was that of aircraft mechanic (n=5); other occupations, mostly mechanical or technical trades, were each mentioned once.

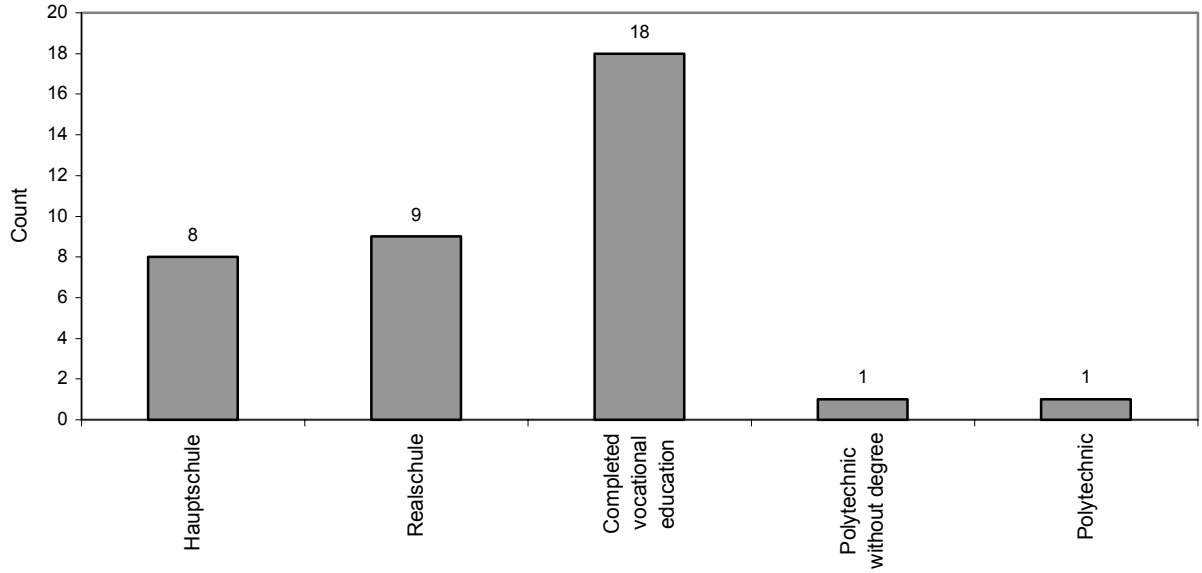


*Fig. 7 Educational degrees and vocational education in the aeronautics sector*

When asked about their language skills, most participants declare to have learned English as a foreign language (n=17) and to estimate their command of the language as "good" (n=12). Only four respondents additionally possess basic knowledge of another foreign language. Among the vocational qualifications obtained after completion of the initial voca-

tional training there is a clear dominance of the certificates CAT A and CAT B1 (n=7) and *Luftfahrzeugprüfer Klassen 1 und 2* (aircraft approval class 1 and class 2; n=6).

The current employment status and work conditions of the respondents may be characterized as follows: The time respondents have been in working life ranges from 8 to 49 years, the largest group of them being in employment for more than twenty years (n=13). On average respondents have a total work experience of 27.2 years and have been working in their current company for 10.8 years. All participants who provided valid responses save one indicate that they have unlimited employment contracts (n=16) and work on full-time positions (n=15); one respondent has a special employment status since he works within a retraining measure (*Umschulung*). The average working time per week ranges from 40 to 50 hours with a mean of 42.2 hours. The monthly net-income of most participants (n=7) is between € 1,501 and € 2,000.

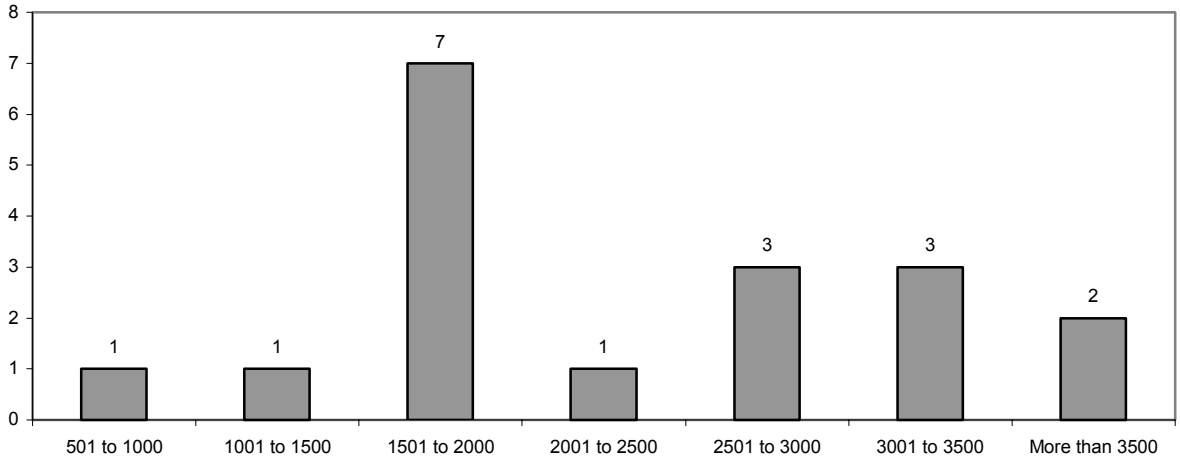


*Fig. 8 Monthly net-income in the aeronautics sector*

When asked about their current position in the company hierarchy, respondents provided partly inconclusive answers, and it appears that they found it difficult to locate themselves within the four-level scale proposed in our questionnaire. Hence, it is not possible to estimate their orientation towards professional advancement as in the case of IT professionals. It can be observed, however, that the majority of respondents conceive of themselves as standing on a relatively advanced level of their occupational career. This is to say that 6 of them indicate to be currently "in a phase of growing abilities" and 7 of them either are in a phase of "stabilization" or have reached the peak of their career. Three respondents believe that they have already passed the top of their career, and actually one of them is facing his retirement, which is to take place in early 2004.

### 1.3.3 Learning and CVET Participation of respondents

#### The IT sector

F30a was defined as the dependent variable „Adult Education Participation (AEP)" asking for the participation in CVET in the last 5 years. 70 per cent (94) of the participants in the survey have participated in CVET activities. Participants enrolled five times, on average one

per year. Similar results were achieved fort the question of AEP in the last 12 months. Compared to the data of the "Berichtssystem Weiterbildung" from 2000 this is significantly higher than the average participation rate in Germany. The sum of professional and general AEPs in this survey was 43 per cent (Kuwan, 1999, 2001).

### *Motivation*

Summing up, the main motivation to take part in AE activities is related to workplace needs. 75 per cent agree with the item "I took part because of concrete demands and needs of my workplace". 74 per cent agreed with the item that they wanted to widen their occupational horizon and 67 per cent declared advancement is a motivational factor for participation.

### *Effects*

It is informative to compare the motivation with the estimation respondents make on the effects of AEP: "Skills are being improved", is agreed upon by 81%. "Rising perspectives for mobility" are agreed with by 62%. 60% think that their own ability to improve their work environment has increased and "widening of their responsibility" was agreed with by 62% of respondents. Only 44% agree with the item, that the prospects in the firm improved with AEP, but only 11% indicate that their income rose because of the participation. This to some extent reflects the traditional initial VET concentration of the German system as described in our first report and supports the thesis CVET as the biggest illusive event after the public media (Geißler, 1987; Grollmann, Tutschner, & Kaune, 2004).

### *Quality*

Quality of seminars is basically regarded as good. E. g. 80% state that there is a good alignment of prior information with the actual course and 68% say that the expectations were fulfilled 67% agree that the courses were directly related to the problems faced at work and 77% rate the instructors as competent.

Summing up, we can say that it is a quality signal of CVET courses when they directly relate to the actual workplace and the skills needed. This is also one of the major drivers for participation. Satisfaction is quite high, since overlaps between the offers and the concrete needs seem to be good. In the emerging IT sector, in which there was no established system of VET and qualifications in its booming years this is interesting, since the respondents attest a high degree of quality to the measures of CVET in those years.

### *Attitudes to CVET*

The high participation can already be seen as an indicator for the general high estimation of CVET. Negative items were strongly rejected by the respondents: "CVET is wasted time" was rejected by 95% of the respondents. 92% disagree that they underwent such a profound initial VET that the don not need any CVET anymore. The next items also exemplify this. Percentage always shows the number of disagreeing respondents:

- "CVET is not important for the fulfilment of occupational tasks" (89%)
- "I have gathered enough experience so I do not need to participate in CVET" (89%)
- "Participation in CVET does not have any effects on my work" (81%)

This shows that there in general is a very positive attitude to learning in this sector. This is also being proved by the following items:

– "I like to learn" (87%)
– "It is not a burden for me that I have to learn constantly" (70%)
– "To stay up-to-date in your occupation you have to learn constantly" (97%)

In general enterprises superiors are not rated as obstacles for the participation in CVET which fits to the general positive attitude: Superiors are not seen as an obstacle for the participation in CVET (63% and 74%). 7% indicate that they had problems in participating in CVET because of their superiors

### *Non-Participation*

It is especially two reasons, which are an obstacle to participation: costs and the heterogeneous skills and knowledge of other participants:

– "I would like to participate, but someone would have to take over the costs" (52%)
– "CVET is too expensive" (44%)
– "The skills and knowledge of participant is too different" (43%)

There is a significant correlation between the costs and the participation in CVET.

### *Information on CVET*

Internet is the most important source of information on CVET courses (51%) followed by superiors (44.9%) and colleagues (43.9%) at the workplace. At the fourth rank there follow pamphlets and marketing material (41.8%).

## The Aeronautics sector

According to nearly all respondents the most important means of obtaining the qualification necessary for their current job was their initial vocational education (n=16). As was to be expected from a rather traditional industrial sector with a long-established system of qualifications such as aeronautics, classical schemes of vocational education and training seem to play a much more important role than in the IT sector. However, measures of continuing vocational education and training (n=9) and learning on the job (n=9) are also highly valued as important factors. As regards overall participation in formal CVET, the majority of respondents indicate that they have been participating in training activities since the beginning of their occupational career (n=13). One respondent has been participating already before his entry into working life, whereas three of them did not participate at all. "Adult Education Participation" as the dependent variable in the context of the present study, ranges from one to five training events for most respondents (n=14) with a maximum of 10 and an average of 3.5 courses; in comparison to the IT sector, the level of participation is thus slightly lower. This is also shown by the fact that during the past twelve months the majority of respondents (n=10) did no longer participate in CVET measures.

The primary source of information on CVET programmes for technical workers in the aeronautics sector are the work superiors (n=10), followed by the *Luftfahrtbundesamt* (German Federal Aviation Authority) (n=4). What is remarkable is that especially those sources

of information that would indicate a more active search on the part of the prospective course participants, e. g. the internet, are mentioned by relatively few respondents and that three of them even declare to have no access to information on CVET whatsoever. It may therefore be assumed that employees in this sector tend to have a somewhat more "reactive" attitude than those in the IT sector.

None of the respondents has ever attended training programmes targeted especially at unemployed persons. Job-related programmes have been attended by at least 13 respondents (the respective variable contains a missing value; it can, however, be inferred from the number of valid responses to the questions concerning the assessment of the courses that actually 14 respondents participated in job-related training activities).

Participation in these specific job-related activities was motivated predominantly by workplace needs, i.e. requirements related to the performance of concrete job tasks (n=10) and by instructions or requirements imposed by the *Luftfahrtbundesamt* (n=10). The intention to widen one's occupational horizon or the wish for advancement also have some influence, though these factors are not as important as among the respondents in the IT sector.

With regard to the assessment of both the quality and the effects of the courses there are no significant differences between the two sectors. Like their counterparts in the IT sector, the respondents in this sample tend to be "satisfied" or "very satisfied" with CVET measures in general (n=11). Concerning the respondents' assessment of the job-related activities, which was again operationalized as the extent of agreement with various statements on the quality and the effects of the courses that was measured by means of a five-point Likert scale, it was particularly the compliance of the actual course contents with the information given in advance and the direct applicability of the newly acquired skills on the job which were strongly affirmed by the participants, the scores being n=13 or 93% for each item. Furthermore, 11 respondents (79%) agree with the statement that the prerequisites for the courses with regard to participants' prior qualifications were clearly formulated, and 10 of them (71%) give a positive assessment of both the instructor's competence and the quality of course materials. 71% of the respondents also say that their personal expectations towards the courses have been fulfilled.

These findings provide further support for the assumption that the relation of the course objectives to the practical demands of the participants' occupational environment is crucial for the quality of CVET measures, which was already suggested by the results of the previous survey in the IT sector. This is also being reflected by the results from the aeronautics sector in respect of the effects of participation in training measures. Among these the improvement of professional skills is the most important item since 11 respondents (79%) indicate that their participation has actually led to an improvement; on the other hand, possible effects concerning the economic conditions of respondents are relatively weak without affecting the overall level of satisfaction. For example, it is still 64% of respondents who indicate that their career prospects in the company as well as their opportunities of self-determination on the job have been improved, but merely half of them believe that there has been an improvement of opportunities in the labour market outside the company (46%) or indicate that their income rose as a consequence of their participation (50%).

The general attitudes to continuing vocational education among technical workers in the aeronautics sector are as positive as those expressed by IT professionals. Nearly all respondents in the present sample reject the idea that "CVET is wasted time" as well as the statement that since their initial vocational education has adequately prepared them for their work they do not need any further training (n=16). Similar results can also be observed with regard to the following items, percentages always indicating the proportion of those who disagree with the respective statement:

– "I have gathered enough work experience and do not need to participate in CVET" (93%)
– "CVET is not important for the fulfilment of my occupational tasks" (87%)
– "Participation in CVET does not have any effect on my work" (75%).

Respondents also express a relatively positive attitude towards learning in general. For example, the statement "I like to learn" is agreed with by 12 respondents (71%) and even 15 of them (88%) share the view that in order to be able to respond to one's occupational requirements one has to learn continuously. Furthermore, 14 respondents (82%) state that the necessity to learn constantly is not a burden for them. On the whole these findings suggest that notwithstanding the dissimilarities between the two groups in terms of educational and social background mentioned in the previous section there are no major differences in their attitudes and behaviour concerning CVET. More specifically, the lower educational level of the respondents from the aeronautics sector, which might have indicated a certain lack of motivation, actually does not seem to affect their overall willingness to learn, at least as far as formal learning activities are concerned. This apparently contradictory result might possibly be interpreted as the effect of a particular attitude towards education and learning, namely, a pragmatic or re-active orientation in which learning activities take place primarily as responses to concrete and practical needs rather than being intrinsically motivated.

### 1.3.4 Informal Learning and attitudes towards learning

#### Some Indicators on Informal Learning in the IT sector

Even though formal CVET participation plays a critical role as shown by the former section, in addition there is high degree of learning involved in the ordinary work of IT employees. There are several of indicators illustrating the importance of informal learning within the everyday practice and work. The following items are examples:

– "I prefer to learn on my own" (42%)
– "CVET is involved in my Workplace" (42%)
– "I learn what I need to carry out my work from my colleagues" (41%)
– "There is enough time at work to learn" (38%)

However, there is also a high degree of indifferent ratings between 37% and 43%. This might indicate a certain insecurity concerning the self-evaluation of such processes. For the final analysis we are working on building an indicator on learning participation as opposed to formal CVET participation.

Also the answers on the question „Where did you learn your job?“ show how important informal learning is in this sectoral setting:

– “On-the-job” (69%)
– “Self-study” (59%)
– “Programme of formal VET” (55%)
– “CVET” (49%)

A majority of respondents says that they have learned their skills for the job on-the-job or through self-studies. This might reflect the high amount of people who came into the IT field, when there was no formal initial VET established, since that was only introduced in 1997. Some experts speak about 80% of non-traditionally recruited staff in the IT sector.

## Correlations and analytical results in the IT sector

### *Problem-Solving*

Another important issue when it comes to more informal ways of learning is the way of dealing with day-to-day problems in the everyday work process (see Fischer, Boreham, & Samurcay, 2002). Even though some data indicates that there is strong team-orientation, the major problem solving strategies are individual in their scope. Internet and online-help systems are ranked higher than help through peers as the following ranking of items illustrates:

– Internet (Fora, Newsgroups) (82%)
– Online-Help (75%)
– Peers (68%)
– FAQ-Lists (63%)
– Handbooks (59%)
– Team problem solving (53%)
– Trial and error (36%)
– Technical support of vendor (34%)

However, internet fora can be seen as a collaborative way of solving problems, since they usually provide for discussion and threading and are therefore just a new way of how to solve problems in a team. This might be especially important for the wide job profiles in SMEs, since here the experts can not always draw on collegial experience and knowledge. Through factor analysis we have isolated five different strategy bundles of problem solving. Those can be clustered in the following categories:

– General Sources and Media;
– Product specific Sources;
– Professional contacts;
– Experiments and out-firm contacts.

The importance of those and the connection to other variables will be mainly part of the final analysis of data.

### *General Attitudes and values*

Also on the basis of factor analysis we can make a distinction between six general value orientations. They inform about the following distinct value orientations of IT workers and can be used in further analysis in how far they correlate with other variables in the sample.

Those six factors we labelled with:

- Engagement and identification with communities of practice;
- Self-reflexivity and willingness to learn;
- Career orientation and coping optimism;
- Willingness to take over responsibility;
- Skilled workers job security;
- CVET quality.

Those factors will be described in detail in the following sections.

### *Engagement, Identification with Community of practice*

This factor indicates a combination of the motivation of successful coping with the job and belonging and participating in a community of practice, it consists out of the following single items.

- "It is important for me to successfully cope with job-challenges" (99%)
- "I like to support my colleagues" (94%)
- "Team-spirit is important to me" (88%)

### *Self-reflexivity and willingness to learn*

This factor is made up with items that indicate a sense of self-reflexivity and a positive attitude to learning.

- "It's difficult for me to make an estimation how good I perform in a specific task" (43%)
- "There are differences between my estimation of my work and my colleagues estimation" (23%)
- "I like to learn for my job" (87%)
- "To stay up-to-date it is important to learn constantly" (97%)

### *Career orientation and coping optimism*

This factor is a combination of items which stress issues related to career advancement.

- "Possibility of promotion is important to me" (77%)
- "I think I can shape my personal and occupational fate" (72%)
- "Money is important to me" (66%)

### *Willingness to take over responsibility*

This factor collects items which show a capability and wish for self-responsible work.

- "Usually I check other alternatives before I take a decision" (93%)
- "I am more effective if I can take my decisions on my own" (85%)

### *Skilled workers' job security*

This factor collects items which exemplify a "typical" employed workers stance to job and learning.

- "Job security is important to me" (90%)
- "CVET should take place during office hours" (58%)
- "I can learn everything without CVET programmes" (negative correlation; 23%)

### *CVET Quality*

This factor collects items which address a critical quality consciousness to CVET.

- "I only enroll for and participate in CVET when there is detailed information available" (82%)
- "I am pretty picky with regard to CVET" (46%)

Those different factors can be used later as sets of normative orientation for analysis of correlations with other factors. On the descriptive level we can already see the significance of team-identification, willingness to learn and the importance of job security. Especially with the latter three there seems to have been a normalisation when comparing it with the myths of the hyper-flexible and mobile IT sector of the nineties. However, there still can be seen a high degree of advancement orientation. There are significant correlations between the three factors "skilled workers' job-security", "career orientation" and "Engagement and identification with communities of practice" and the variable CVET Participation.

### Correlation between selected factors and variables in the IT sector

A number of significant correlations between different variables and factors could be found, of which a number will be presented here. There is a significant correlation between the costs and the participation in CVET.

Some propositions on formal CVET participation:

- CVET participation is positively connected to the wish for widening the vocational horizon.
- The bigger the employing enterprise, the higher the chances to participate in CVET.
- The less the problems of time, the higher the participation.
- Participation is especially high with respondents who have a high sense of job-security.

Self-learning is positively connected to:

- satisfaction with the current position,
- freedom of action within the job,
- recognition of the own work ,
- positive attitude to the superior.

Satisfaction with CVET is positively associated with:

- job satisfaction and a positive work environment,
- satisfaction of personal expectations towards the courses,

– alignment of prior information with actual courses,
– positive effect on the job-skills and knowledge.

**Informal learning and problem solving in the aeronautics sector**

The data collected in the survey provides some further evidence of the re-active learning orientation. A clear distinction can be drawn between the two occupational groups with regard to more informal types of learning as well as the strategies respondents apply for the solution of practical problems at work. It is quite obvious that technical workers in the aeronautics sector are less inclined towards informal learning than their colleagues in the IT sector, for all those items that indicate learning activities outside formal training programmes and also to some extent a sense of individual responsibility for one's own educational development receive distinctly lower ratings. For example, it is only 18% of respondents who agree with the statement "I prefer to learn on my own," compared to 42% in the IT sector. Moreover, 47% of them reject the statement "CVET is involved in my workplace" while 53% merely express indifference, and 59% disagree with the statement "I learn what I need for performing my job tasks from my colleagues", 35% of them being insecure on this matter. Respondents also express little confidence in their overall self-learning abilities. The majority of them (n=11, 61%) reject the idea that they can acquire the necessary knowledge without attending formal CVET measures. As was mentioned above, self-study has played only a minor role as preparation for the current job since only 5 respondents (28%) declare to have employed this method, whereas the score in the IT sector is 59%. On the other hand there is also evidence that the work environment itself is probably somewhat unfavourable as regards informal learning. A high proportion of respondents (88%) reject the statement that they have enough time to learn at work, and although still 50% indicate that learning on the job had been important for acquiring the necessary skills for the current occupation, the score is remarkably low in comparison to the IT sector (69%).

The problem solving strategies employed by the respondents tend to be rather "conservative" – that is, they rely mostly on traditional sources of information such as printed material and do not involve any kind of experimentation – and they also express considerable team-orientation. Most respondents (88%) indicate that they use handbooks from the respective manufacturers whereas only 50% contact the technical support provided by the manufacturers. Collaborative strategies of problem solving are also of great importance since 12 respondents (67%) declare both that they ask their colleagues for assistance in case of problems and that they receive help from their colleagues. The statement that problem solving usually takes place in teams is agreed with by 50%. Obviously due to the particular safety requirements in the aeronautics sector the experimental method of "trial and error" does not play an important role here. The statements "I solve concrete problems by means of trial and error" and "I use to experiment on a trial and error basis even when there is currently no problem to solve" are almost unanimously rejected by the respondents (n=16). It must also be observed, however, that respondents make relatively little use of the more easily accessible strategies of professional contacts outside the firm. A high proportion of them (67%) declare that they do not discuss technical problems with their colleagues during their leisure time and that they do not draw on knowledge from peers outside the company when solving a problem.

### Selected findings concerning general attitudes towards learning aeronautics sector

Given the small size of the present sample it would be inappropriate to apply the technique of factor analysis in order to extract some more complex patterns of attitudes and value orientations. The discussion of this matter must therefore be confined to a summary of the descriptive data that emerged from the analysis of the single items which express respondents' attitudes and values. On the whole the results are very similar to the findings in the other sector, i. e. many attitudes and opinions are shared between the two groups. Instead of reporting the results in detail, which would for the most part lead to nothing more than a repetition of the account given in the previous report on the IT sector, it should be sufficient to concentrate on the differences between the sectors. Among the groups of value orientation that were identified by factor analysis in the course of the previous survey differences that deserve some attention occur with regard to those items that belong to the groups "self-reflexivity and willingness to learn" and "sense of CVET quality". The particular character of the respondents' attitudes towards learning has already been pointed out above when their motivation concerning both formal and informal learning was discussed. The results concerning respondents' sense of CVET quality are pointing in the same direction, that is, the affirmation of the respective items is weaker than among IT professionals, indicating a less critical attitude. Only 47% of the respondents agree with the statement "I only participate in CVET when there is detailed information available" and 24% affirm that they are "very selective" with regard to suppliers of CVET while 47% of them express indifference.

## 1.3.5 Results on the new system of IT CVET

The new system of CVET in has been developed to provide open and flexible entry points for technical workers in the IT sector to gain accreditation of their knowledge and skills acquired during work (Grollmann et al., 2004). It was introduced in 2002. Since it is especially addressed to those who have not originally be trained in the IT sector, it was of specific interest to us in how far IT workers are familiar with the system and in how far it is suited to the needs of them.

Given this strong advancement orientation the new system fits the need of staff well. However, the new system first has to prove its value and usability in practice, which cannot happen as long as it is not known by its target group.

### Familiarity with the new system of IT qualifications

85 per cent of the respondents did not know the new system of IT qualifications. Therefore it was only 18 of the respondents who gave an answer on the question in which level and of qualifications they would be interested in. So there were three of respondents answering on the question without knowing about the existence of the new regulation. 10 expressed interest in specialist level qualifications, five in operative professional and three in the level of strategic professionals.

### Size of enterprise, CVET needs and IT CVET system

Given the small number of people aware with the new system, we can nevertheless say, that is especially personnel from bigger-sized enterprises who are familiar with the new system. This is interesting since the new regulation is especially targeted to workers in SMEs.

The overview on the skills and qualifications of the respondents could give some hints on the question in how far and which competencies and knowledge could be certificated through the use of the new system and its qualifications on the specialist level. Taking into account the picture of our sample those would lie especially in the fields of software development and network administration.

The biggest overlap between work tasks of the respondents and the formulated tasks in the specialist profiles can be found with the following task descriptions. However that might also be due to their very general formulation:

– Analysis and conceptualisation of solutions (85%);
– Conceptualisation /implementation of software solutions (62%);
– Support of users (58%);
– Development and maintenance of documents for IT products and IT procedures (54%);
– Configuration/operation of applications (53%).

There are overlaps with existing specialist profiles in the new system of IT qualifications. However, the question which remains is in how far the assessment and learning forms of the new IT qualification system are an appropriate means for those who are interested in professional advancement in the IT sector. For the time being it is of crucial importance that they know about it at all.

### Areas of work and strategies of problem-solving

Through factor analysis we aggregated the 31 different task descriptions under use in the IT qualification system to five broader fields of activities.

– Networks/technical Infrastructure (F22/4, F22/5, F22/6, F22/15, F22/17, F22/21, F22/22)
– Multimedia/Design (F22/10, F22/24, F22/29, F22/30, F22/31)
– Software solutions/databases (F22/7, F22/8, F22/9, F22/23)
– Product-/Quality management (F22/12, F22/13, F22/14)
– Support/Training (F22/11, F22/18, F22/19)

Those "sub-domains" of IT work correlate with different sets of problem solving. There are significant correlations between the following sets:

In both fields, networks as well as multimedia, employees especially solve problems by drawing on general available sources and media. In multimedia this also proved by a negative correlation between product-specific material and work in this field. Employees working in the field of networks and technical infrastructure are more likely to use professional contacts out of their immediate environment to solve problems. Employees in the field of databases and development especially draw on product-specific source of information.

Employees who take over tasks in the field of quality management have high degree of identification with their tasks and the team. And finally those taking training and support functions are likely to make use of outside contacts for problem-solving.

| | | Number of employees | ALLROUND |
|---|---|---|---|
| Number of employees | Pearson coefficient | 1 | -.254 |
| | significance (both sides) | , | ,004 |
| | N | 125 | 125 |
| ALLROUND | Pearson coefficient | -.254 | 1 |
| | significance (both sides) | ,004 | , |
| | N | 125 | 134 |

*Tab. 6 Correlation between size of enterprises and variety of tasks*
*** Correlation is significant on the level of 0.01 (bilateral).*

The table shows that there is a significant negative correlation between the size of the enterprises and the variety of tasks the employees encounter: the bigger the enterprise, the less manifold are the tasks, the employees have to cope with. This raises questions about CVET courses specifically targeted to the need of SMEs. To get a measure of the variety of tasks (ALLROUND) we have built an indicator based on the sum of the individual scores on the above mentioned factors.

### 1.3.6 The ISSTAL-Model on CVET participation

The PARTICIPA Project chose the model on adult education participation of D.H.Smith und Peter S. Cookson (Cookson, 1986) as a general framework for its research activities (Brown & PARTICIPA Project Consortium, 2004). In our questionnaire we have operationalised a number of issues which are related to this general framework.

The ISSTAL model distinguishes six levels of factors which influence participation in CVET. External contextual factors exert the weakest influence on CVET participation and factors on the level six (situational variables) exert the strongest effect. We did not yet look at the questions raised on effects by ISSTAL via path analysis. However, on the basis of our correlation analysis we can already identify sets of factors for the different levels of the model and get an orientation which relations between variables exist. In further Step we will investigate the relative weight of different factors via path analysis.

#### External factors

The relation between different contextual factors and CVET participation was not systematically examined in our approach since there is already a substantial amount of data which can be found in the literature (Grollmann et al., 2004). Nevertheless we can say that the IT sample shows a participation rate which exceeds the German average participation rate strongly: The same is true for aeronautics sector. Reasons for that contributing to a strong participation are: strong job related needs, good a wide supply of courses, a high degree of familiarity, accessibility and the support through the employer.

### Social background and social roles

There is a slight positive correlation between age and CVET participation. Also we found that with increasing age advancement orientation and self-reflexivity willingness to learn decline. On the other hand there is the result, that the lower the position in the companies' hierarchy the stronger is the commitment to learning.

### Traits and intellectual capabilities

With regard to this level it is interesting to mention that there is a correlation between intellectual capability and the wish to widen the occupational horizon. In the aeronautics sector the willingness to learn is as much as high as in the IT sector even though the level of formal education is not as high. In the cross sectoral comparison that shows that learning is very strongly connected to immediate workplace needs.

### Attitudes and dispositions

In this connection we explored the factor Skilled workers' job security in the IT sector. This factor collects items which exemplify a "typical" employed workers stance to job and learning, such as importance of job-security, the opinion that CVET should take place during working hours and the expressed need for support in learning through CVET measures. The factor correlates with participation in CVET. Persons who score high on this factor also expect a high utility from CVET.

There is a strong relation between job satisfaction and the assessment of the work environment. The level of tasks is less strongly connected to job satisfaction. Routine jobs even lead to higher degree of job satisfaction. Social values seem to be of bigger importance to respondents for the assessment of job-satisfaction than economic or subject-related orientations.

### Gathered Information

There is no direct relationship between educational experiences and CVET participation. There is a strong correlation between the assessment of the job and the assessment of the different aspects of quality of CVET measures. This might be due to a general positive attitude. General satisfaction with CVET is correlated positively with

– Fulfilment of Expectations (r=0.511)
– Alignment of prior information and actual courses (r=0.406)
– Improvement of job skills and knowledge (r=0.377).

The quality consciousness in the aeronautics sector is not as high as in the IT field. This might however be better explained by the relative oligopoly of CVET providers than as personal traits of the learners.

### Situational variables

On this level time plays a critical role. The wider the possibilities to shape one's own time schedule the higher participation in CVET. (r=0.271). The size of enterprises also plays a role. The bigger the employing enterprise, the stronger the participation in CVET (r=0.288). In addition it seems as if when employers take over the costs, participation rises.

It can also be seen that there is correlations between the five factors of job-tasks and the ways respondents deal with problems. E.g. problems in work multimedia tasks are less likely solved by product-specific documentation and information. Learning in work – especially in teams – plays a critical role for the aeronautic technicians, however the consciousness seems not to be as high as in the IT sector. We hope to get deeper insight in to this issue when analysing the qualitative part of our study.

### 1.3.7 Final remarks

Our study shows that CVET participation is much stronger in the IT field than in the overall population. It became also clear, that the main motivation behind CVET participation is strongly connected to job-needs and the participation in CVET is especially targeted at widening the occupational horizon. The strong participation is also true the aeronautics sector.

For the majority of respondents there is good alignment between the own expectations and the courses and the courses are in general being assessed as contributing to improving the occupational knowledge and skills. That results in an overall good assessment of the quality of courses and instructors. Where as in the IT sector the situation is more "liberal" in terms of supply and demand of CVET provision, the situation in the aeronautics maintenance sector is more fixed. That results in a somehow weaker quality consciousness within the aeronautics sample.

In the IT sector Quality courses are those which are directly targeted to the practical needs of the respondents and in which there is good instructors. The survey shows that there is a high acceptance of and positive attitude towards CVET in general. Respondents are particularly aware that lifelong-learning is a precondition for coping with the demands of the jobs in the IT field. It fits well into this scenario, that the management of enterprises is rather seen as a promoting factor for CVET participation.

There are two major obstacles mentioned against CVET participation: too high costs and settings with a too heterogeneous audience.

Even though formal CVET measures play a significant role in the IT sector, more informal learning, such as learning at work, learning through self-studies and learning from peers are of significant importance. However there is also a huge amount of indifferences when looking at the results for those informal learning strategies. This might be due to high degree of unawareness among the respondents with informal learning experiences. On the other hand the acquisition of skills and knowledge on the job is rated very high among the respondents as well as the importance of self-study. In the aeronautics sector this learning awareness seems even be weaker than in the IT field.

It would be very informative from a professional as well as from a scientific point of view to scrutinise in detail which content can be learned in those informal settings and which is more appropriate for traditional forms of delivery.

Even though team orientation in general is quite high among the respondents across the sectors, the patterns of problem-solving are more individualised in the IT field, e.g. internet fora or online help systems. We can not finally conclude if this is more due to the individual problems to be solved or a gap between the attested team spirit and actual occupational

behaviour. It might also relate to the strong individual orientation towards successful coping with the job tasks.

A strong advancement orientation and a dimension which we called coping optimism are traits of the respondents which exemplify a typical attitudinal pattern in the IT sector. Because of the small sample in the aeronautics sector it is not possible to clearly identify equivalents in the aeronautics sector, however it plausibly can be said, that the situation in the aeronautics sector as because of its objective organisation is not as dynamic in that sense.

It became visible that the advancement orientation is spread especially among those with lower educational credentials. Here, the new system of IT qualifications could be an appropriate answer. However a big handicap has to be overcome first: the targeted population does not know about its existence. On the other experiences with the system are still to less to make a judgement, if it fits the needs of the employees in this sector. The match between the levels and the horizontal structure with its 29 specialist profile has to be investigated more properly in the light of the CVET needs of the targeted population. Because of the regulations on CVET in the aeronautics sector, the situation is much more transparent.

There is data in our IT survey which points to a possible mismatch especially with regard to SMEs, since the job-profiles are broader than those in bigger industries. The challenge is to familiarise the targeted audience with the existence of the new system as well as shaping it in sense that it fits the needs of the targeted audience. The combination of strong advancement motivation on the individual level and the rather weak actual effects of CVET in a time of consolidation of the whole sector are a critical test ground for the new system of CVET qualifications. Hopefully, this relationship does not impede the high level of learning commitment which can be found among the employees in this sector.

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## *1.4 A Regression Model of CVET Participation in the IT sector*

*Wolfgang Wittig*

### 1.4.1 Introduction

The objective of the present paper is to give an overview of the development of a causal model based on the method of multiple regression analysis that contributes to the explanation of participation in continuing vocational education and training in the IT sector. In the first section we will give a somewhat more detailed description of the factor analysis already mentioned in our Second Report that was performed with a view to the operationalisation of the ISSTAL model that serves as the theoretical framework of the project. The following section deals with some of the results of explorative data analyses, namely, the comparison of the groups of participants and non-participants with regard to some important characteristics. These analyses were carried out in order to obtain some additional information on which the selection of possible predictors could be based. The final section presents the results of the regression analysis and discusses some provisional conclusions.

### 1.4.2 Factor analysis and operationalisation of the ISSTAL components

In order to identify more comprehensive background variables that might serve as indicators for the several dimensions of the ISSTAL model we performed factor analyses of the items concerning occupational tasks (question 22), work environment (question 24), problem solving strategies (question 25), CVET experiences (question 38), attitudes and expectations towards CVET (question 40) and personality traits and value orientations (question 42). Factors were extracted by means of principal component analysis with an eigenvalue of at least 1 used as the criterion for extraction and submitted to varimax rotation. As a general rule, factor loadings below .500 were not taken into account. The factor solutions that emerged from this procedure can be described as follows:

The analysis of occupational tasks yielded 8 components, five of which ultimately were accepted as theoretically convincing. The composition of these factors with the respective loadings as well as their contribution to the overall variance are listed in table 1.

With regard to occupational tasks we thus identified the following components, which belong to the category of *situational variables* in the context of the ISSTAL model:

– Networks and technical infrastructure (FAC1_2),
– Multimedia and design (FAC2_2),
– Software solutions and databases (FAC3_2),
– Product and quality management (FAC4_2),
– Support and training (FAC5_2).

It is important to notice that these clusters of product-related job tasks do not exactly correspond to the more general areas of occupation that respondents ascribed to themselves when asked about their primary tasks (question 19). As already stated in the previous reports, these major responsibilities, unlike the factors extracted here, also include non-technical tasks such as marketing and sales.

| Item | FAC1_2 | FAC2_2 | FAC3_2 | FAC4_2 | FAC5_2 |
|---|---|---|---|---|---|
| Conception/implementation of network systems | .894 | | | | |
| Configuration/operation of network systems | .879 | | | | |
| Configuration/operation of IT systems | .864 | | | | |
| Conception/implementation of IT infrastructure | .776 | | | | |
| Conception/implementation of security systems (hardware) | .677 | | | | |
| Conception/implementation of security concepts | .629 | | | | |
| Support of users of products and systems | .621 | | | | |
| Development/design of web performances | | .828 | | | |
| Conception/implementation of multimedia applications | | .767 | | | |
| Development/implementation of design concepts | | .765 | | | |
| Configuration/operation of intranet and internet services | | .597 | | | |
| Conception/impl. of solutions for knowledge management | | .529 | | | |
| Conception/implementation of complex database solutions | | | .792 | | |
| Conception/implementation of software solutions | | | .771 | | |
| Conception/implementation of user interfaces | | | .603 | | |
| Configuration/operation of databases | | | .547 | | |
| Documentation of development processes | | | | .792 | |
| Controlling of processes and products | | | | .603 | |
| Conception/optimizing of products and services | | | | .523 | .500 |
| Advice/sale of products and solutions | | | | | .698 |
| Operation/controlling of projects and sub-projects | | | | | .641 |
| Conception and running of training measures | | | | | .633 |
| % explained variance | 16.090 | 11.186 | 8.838 | 8.817 | 7.583 |

*Tab. 7 Occupational tasks (rotated solution)*

Additionally, the aforementioned factors were used to develop an indicator variable to express the variety of job tasks. The sum of factor scores, which were recoded into a five-point scale for this particular purpose, was taken as a measure for variety, assuming that respondents with more specialised tasks are likely to show low scores in all factors but one, whereas those whose responsibilities are more diversified would accordingly tend to have higher scores in all occupational domains. This artificial variable named "variety of tasks" belongs to the *situational variables* as well.

In the course of the analysis of the work environment there emerged two factors. The results of this analysis are outlined in the Tab. 8.

From these results the conclusion can be drawn that there are basically two dimensions that one can discern with regard to the individual perception and evaluation of the work environment. The first of these (FAC1_3) may be termed "working atmosphere" or "work climate". The items of which this factor is made up reflect predominantly social and emotional circumstances of the working process. The second component (FAC2_3) expresses

the opportunities offered by the current position to exercise one's faculties in a relatively autonomous manner. We therefore propose the term "self-realisation" for this factor. From the point of view of the ISSTAL model, these two factors are also part of the *situational variables*.

| Item | FAC1_3 | FAC2_3 |
|---|---|---|
| Good working conditions | .858 | |
| Work is being appreciated | .826 | |
| Good relationship with work superiors | .825 | |
| Leading position | | .839 |
| Job tasks require creativity | | .762 |
| Opportunity to work independently | | .606 |
| % explained variance | 36.681 | 25.377 |

*Tab. 8 Work environment (rotated solution)*

From the originally six factors extracted from the variables concerning the methods of problem solving used by the respondents in their daily work, one was subsequently declined for being theoretically inconclusive. The remaining components are described in table 3. Since these factors indicate patterns of behaviour that are relatively independent of specific situations but not as general and comprehensive as character or personality traits, they can be categorised as *attitudinal dispositions* within the ISSTAL framework.

As already mentioned in the second report, the factors indicating problem solving strategies can be labelled as follows (see Tab. 9):

– General sources of information and media (FAC1_4),
– Product-specific sources of information (FAC2_4),
– Professional contacts at the workplace (FAC3_4),
– Experiments (FAC4_4),
– Out-firm contacts (FAC5_4).

The quality of concrete CVET measures attended by the respondents is expressed by two factors as shown in Tab 10.

Whereas the first factor captures those experiences that refer to the content of the courses and their quality as events, the second one deals with the applicability of the newly acquired knowledge and qualifications in work life. We therefore use the term "quality of courses" for the first and "concrete professional use of courses" for the second factor. These two factors are part of the *retained information* dimension of the ISSTAL framework

| Item | FAC1_4 | FAC2_4 | FAC3_4 | FAC4_4 | FAC5_4 |
|---|---|---|---|---|---|
| I regularly read technical journals. | .750 | | | | |
| I use the Internet in order to solve technical problems. | .699 | | | | |
| I place articles in work-related web forums. | .636 | | | | |
| I use FAQ-lists when I try to solve technical problems. | .615 | | | | |
| There are one or more colleagues helping me. | | .889 | | | |
| When there is a problem I ask colleagues in my company. | | .884 | | | |
| Usually we solve technical problems as a team. | | .731 | | | |
| I use online help or assistants. | | | .833 | | |
| I read the manuals of hardware and software. | | | .754 | | |
| I solve technical problems by trial and error. | | | | .893 | |
| I use trial and error even when there is currently no problem. | | | | .781 | |
| I meet colleagues in my leasure time to discuss problems. | | | | | .737 |
| In case of problems I ask colleagues outside the company. | | | | | .696 |
| % explained variance | 14.651 | 14.219 | 11.497 | 10.230 | 10.040 |

*Tab. 9 Problem solving strategies (rotated solution)*

| Item | FAC1_1 | FAC2_1 |
|---|---|---|
| Lecturers were competent | .855 | |
| Individual expectations were fulfilled | .815 | |
| Alignment of prior information with actual course content | .789 | |
| Good working materials | .693 | |
| Requirements for participants had been outlined clearly | .651 | |
| Improvement of perspectives in the company | | .843 |
| Improvement of the ability to shape one's area of work | | .829 |
| Improvement of opportunities in the labour market | | .758 |
| Direct relation between course content and work | | .607 |
| % explained variance | 26.538 | 22.523 |

*Tab. 10 Evaluation of CVET measures (rotated solution)*

The analysis of various statements that express attitudes and expectations concerning the participation in CVET (question 40) led to a five-factor solution after the rejection of two components. Tab. 11 shows the composition of these factors.

| Item | FAC1_6 | FAC2_6 | FAC3_6 | FAC4_6 | FAC5_6 |
|---|---|---|---|---|---|
| No need to participate because of sufficient experience | .829 | | | | |
| No need to participate because of good initial education | .812 | | | | |
| CVET would not influence the quality of one's work | .798 | | | | |
| CVET would not influence one's income | .527 | | | | |
| Cannot leave the workplace in order to participate in CVET | | .861 | | | |
| Schedules of courses are incompatible with working hours | | .841 | | | |
| I never found time for CVET measures | | .723 | | | |
| Courses do not offer the knowledge that is required | | | .721 | | |
| CVET is too expensive | | | .682 | | |
| Formal education is of little use in working life | | | .614 | | |
| Would like to participate, but superiors are opposed to it | | | | .764 | |
| Superior does not support participation in CVET | | .516 | | .677 | |
| Participation in CVET is a waste of time | | | | .549 | |
| I learn from my colleagues what I need for my work | | | | | .740 |
| Further training takes place on the job | | | | | .607 |
| Enough time for autonomous learning on the job | | | | | .534 |
| % explained variance | 13.056 | 13.038 | 10.923 | 9.023 | 8.039 |

*Tab. 11 Attitudes and expectations towards CVET (rotated solution)*

Unlike the previous ones, the factors identified in this domain do not correspond to one single dimension of the ISSTAL model. Their meaning and their respective positions within the model can be described as follows: The first factor (FAC1_6), which expresses the individual estimation of one's current abilities as well as the expected benefit from further education, can be termed "utility expectation". The third one (FAC3_6), on the other hand, appears to express the respondents' "experience with regard to the overall use of CVET". These two factors would best fit into the ISSTAL dimension of *retained information*. The other factors "time available for learning" (FAC2_6), "attitude of work superiors" (FAC4_6) and "learning environment at the workplace" (FAC5_6) belong to the category of *situational variables*, as will also be shown in the section on the regression analysis performed afterwards.

The last group of variables that were investigated by means of factor analysis were those expressing respondents' more general beliefs and value orientations. In this case the procedure led to seven components, which were all found theoretically plausible (see Tab. 12).

| Item | FAC1_8 | FAC2_8 | FAC3_8 | FAC4_8 | FAC5_8 | FAC6_8 | FAC7_8 |
|---|---|---|---|---|---|---|---|
| Team spirit is important to me | .751 | | | | | | |
| Personal development is important to me | .656 | | | | | | |
| I like to support my colleagues | .651 | | | | | | |
| I volunteer in case of new tasks | .611 | | | | | | |
| Differences in work assessment | | .664 | | | | | |
| Difficulties in evaluating one's work | | .650 | | | | | |
| I like to learn | .525 | .580 | | | | | |
| Continuous learning is necessary for the job | | .533 | | | | | |
| CVET should take place in the company | | | .770 | | | | |
| CVET should take place near the workplace | | | .735 | | | | |
| I think I can shape my personal fate | | | | .691 | | | |
| Professional career is important to me | | | | .673 | | | |
| Money is important to me | | | | .569 | | | |
| I am more effective when making my own decisions | | | | | .804 | | |
| I use to check alternatives before making a decision | | | | | .787 | | |
| I can learn everything without CVET | | | | | | -.733 | |
| Job security is important to me | | | | | | .642 | |
| CVET should take place during office hours | | | | | | .548 | |
| Participation only in case of detailed information | | | | | | | .825 |
| I am very selective with regard to CVET | | | | | | | .813 |
| % explained variance | 12.173 | 8.558 | 8.173 | 7.734 | 7.544 | 7.181 | 6.764 |

*Tab. 12 Beliefs and values (rotated solution)*

The majority of these factors appear to express relatively permanent character traits and can therefore be regarded as parts of the *personality* category of the ISSTAL framework. The factors that belong to this group are the following:

- Engagement and identification with community of practice (FAC1_8),
- Self-reflexivity and willingness to learn (FAC2_8),
- Career orientation and self-reliance (FAC4_8),
- Sense of responsibility (FAC5_8),
- Skilled workers job security (FAC6_8). The interpretation of this last factor proved relatively difficult because of its rather heterogeneous composition. Basically this factor col-

lects items that reflect certain attitudes towards change and development and also to the insecurity and risk they might entail.

The two remaining factors "mobility with regard to CVET" (FAC3_8) and "sense of CVET quality" (FAC7_8), which are not as fundamental as the above-mentioned, belong to the category of *attitudinal dispositions*.

### 1.4.3 Comparing participants and non-participants

As a supplement to the descriptive analyis of the survey data already presented in the Second Report we also have carried out separate analyses of the two groups of respondents who either participated in CVET in any manner or, respectively, totally abstained from it. Our aim was to reveal differences between participants and non-participants that might help to identify the characteristics relevant for participation. Remarkable differences between the two groups were found with regard to the age of respondents and the size of their companies, to some extent also in respect of their major occupational areas. Concerning the age of respondents and its potential influence on CVET participation one can observe that in the case of our sample participants tend to be older than non-participants, the former being on average 35.2 and the latter 28.5 years old. As shown in figure 1, 60% of the non-participants are between 21 and 30 years old, and none of them is older than 40 years (Fig. 9).

These findings appear to indicate that, contrary to the results reported by other project partners, there is a *positive* effect of the age on participation in CVET. A possible interpretation of this would be that older employees are in greater need for new skills and qualifications in order to adapt to technological innovations, whereas their younger colleagues are sufficiently equipped by their initial vocational education to meet the requirements of their occupations in the foreseeable future.

The size of the company seems to have a strong influence on CVET participation as well (Fig. 10). The majority of those respondents who have already participated in training measures come from enterprises with more than 250 employees, whereas the majority of non-participants work in smaller companies, the largest group of them in small enterprises with up to 10 employees.

It is quite obvious that opportunities for *formal* training measures tend to be confined to bigger companies and that the prospects of employees of smaller enterprises to participate in CVET are much worse. Hence, an interesting question would be whether there exists some kind of compensation in the shape of informal learning among the staff of small companies. In respect of potential indicators such as the application of problem solving strategies and the exploitation of professional contacts, however, the comparison of participants and non-participants did not bring about any important difference.

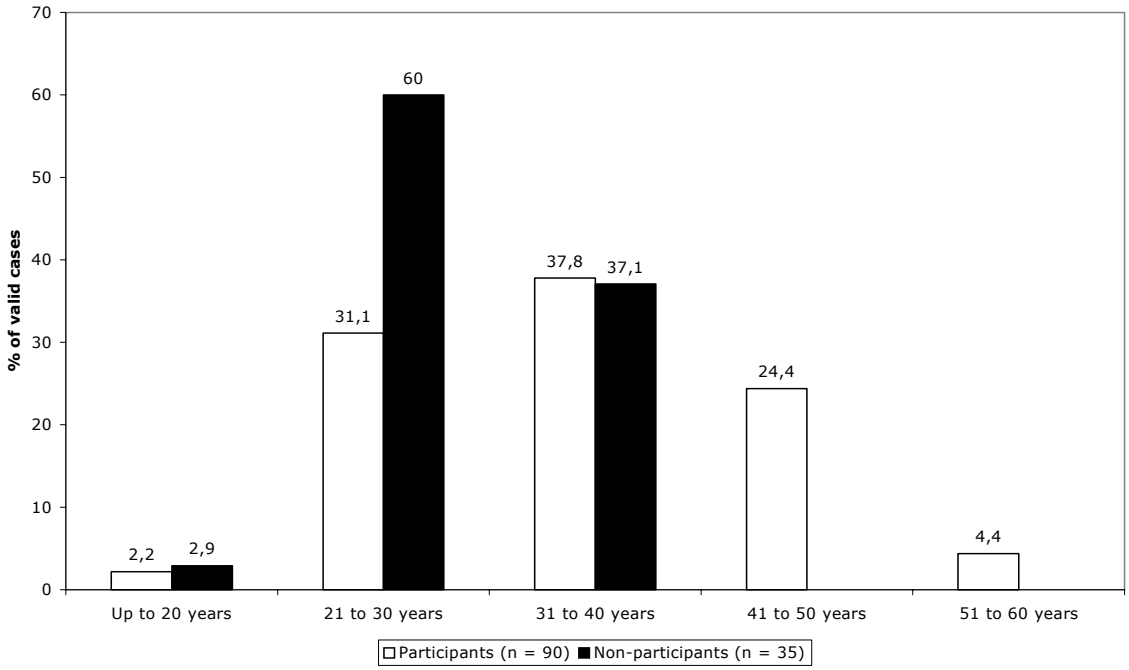


*Fig. 9 Age distribution*

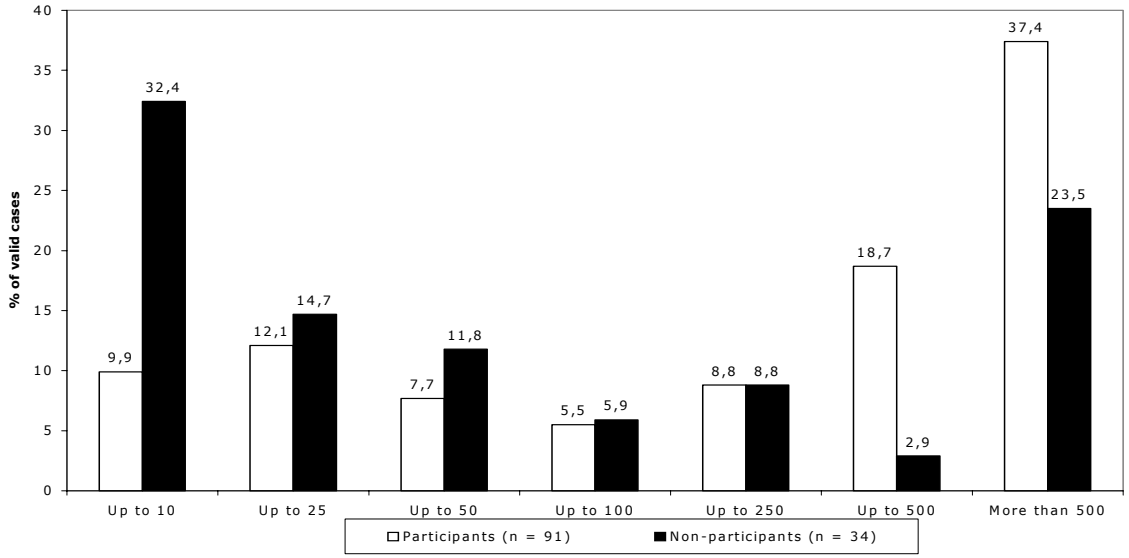


*Fig. 10 Company Size*

### 1.4.4 Regression analysis and development of a causal model of CVET participation

Since our analysis was intended to follow an explorative strategy and to generate hypotheses, it did not appear appropriate to formulate a specific model for testing purposes in advance. Rather, we decided to examine the possible relationships between the factors identified and the criterion variable (frequency of participation in CVET during the past five years) by comparing a variety of possible causal models. This was done by means of a series

of multiple linear regression analyses which were based on the method of successive exclusion of predictor variables according to their significance. By default, an F probability of .10 was used as the limit for exclusion. Out of the roughly 70 variables used in the beginning there emerged a total of 60 different models with a steadily decreasing number of variables. Only few of these, however, were submitted to closer investigation, whereas the vast majority of them were immediately declined as they proved to be of little explanatory worth in terms of their respective $R^2$ coefficients and to show inconclusive results. From the models that were taken into consideration, the following one ultimately was adopted because it combined a maximum of explanatory worth with a minimum of predictor variables. It should be borne in mind, however, that given the purely explorative character of this analysis the model has not been *tested* in any proper methodological sense, which would require the application of the procedure to a different sample. The following results therefore should be regarded as a provisional draft or a first step towards a more elaborate model.

The model includes altogether 41 predictor variables and a constant term. Its overall fit can be characterized as follows: The multiple correlation coefficient R is .867, the determination coefficient $R^2$ is .752 while the adjusted $R^2$ value is .641. The standard error is 2.286. Assessing the quality of the model as a whole, we can say that on the one hand it serves quite well to explain the influence on CVET since the proportion of explained variance of the criterion variable is 75.2%, while its predictive quality is only average. The effects of the predictor variables as well as their respective positions within the theoretical framework of the ISSTAL model are shown in the table below with significant effects printed in bold.

| Predictor | Beta | Significance | Zero-order correlation |
|---|---|---|---|
| **Social background and social roles (part1)** | | | |
| Age | .136 | .122 | .200 |
| Gender | -.240 | .002 | .027 |
| Civil status | .199 | .010 | .256 |
| Number of children | -.236 | .000 | -.086 |
| Monthly net income | -.177 | .028 | .231 |
| “Hauptschulabschluss” | .116 | .058 | .153 |
| Polytechnic without degree | -.167 | .010 | -.146 |
| University without degree | -.296 | .000 | -.170 |
| University (first state exam) | -.262 | .001 | -.109 |
| University (second state exam) | .148 | .044 | -.055 |
| University (M.A. or diploma) | -.128 | .070 | .054 |
| Completed vocational education | -.114 | .134 | -.048 |
| Professional skills: networks | .089 | .198 | .003 |
| Professional skills: programming | .129 | .086 | -.130 |
| Professional skills: support | .103 | .122 | .269 |
| Professional skills: training | .264 | .000 | .266 |
| Professional skills: others | .247 | .000 | .205 |
| Employment status: freelance | -.163 | .010 | -.148 |
| Employment status: unemployed | .096 | .118 | .006 |
| Employment status: other | -.191 | .006 | -.033 |
| Position in the company hierarchy | -.298 | .002 | .018 |

| Predictor | Beta | Significance | Zero-order correlation |
|---|---|---|---|
| **Social background and social roles (part1)** | | | |
| **Personality** | | | |
| FAC2_8 Self-reflexivity and willingness to learn | -.127 | .099 | .036 |
| Attitudinal dispositions | | | |
| FAC2_4 Professional contacts at the workplace | -.159 | .022 | -.102 |
| FAC3_4 Product-specific sources of information | .096 | .162 | -.141 |
| FAC3_8 Mobility with regard to CVET | -.231 | .002 | .012 |
| FAC7_8 Sense of quality with regard to CVET | -.154 | .019 | -.151 |
| **Retained information** | | | |
| FAC3_6 Experience with regard to the overall use of previous CVET | .125 | .070 | .135 |
| FAC1_1 Quality of courses | .229 | .002 | .057 |
| FAC2_1 Concrete professional use of courses | -.109 | .109 | -.166 |
| Improvement of income | .126 | .046 | .040 |
| **Situational variables** | | | |
| Motivation: workplace needs | .277 | .000 | .476 |
| Motivation: instruction from work superiors | -.122 | .047 | .037 |
| Motivation: CVET is mandatory as part of the company culture | .230 | .001 | .301 |
| **Motivation: others** | **.223** | **.001** | **.241** |
| Company size (number of employees) | .226 | .008 | .282 |
| FAC1_2 Networks and technical infrastructure | -.257 | .005 | -.042 |
| FAC3_2 Software solutions and databases | -.121 | .116 | .083 |
| FAC5_2 Support and training | -.093 | .259 | -.209 |
| Variety of tasks | -.368 | .001 | -.002 |
| FAC2_6 Time available for learning | .087 | .214 | .244 |
| FAC5_6 Learning environment at the workplace | .104 | .131 | .039 |

*Tab. 13 Regression model of participation in CVET*

Among the indicators referring to the social background and social roles the participants' current position within the company hierarchy shows the strongest direct effect (-.298), whose apparently negative direction is due to the reverse encoding method. A position on a higher hierarchical level would thus lead to an increase in the frequency of participation. However, the total effect indicated by the zero-order correlation with the criterion variable reveals that the influence of this item is being moderated by an even stronger indirect effect (.316) that points into the opposite direction. With regard to the direct effect it can be assumed that advanced positions in one's occupational career coincide with an increasing demand for CVET because they are achieved only at some distance from the initial vocational education. This interpretation would be in accordance with the observation discussed earlier that the readiness to participate tends to rise as people grow older whereas younger respondents who have only recently completed their vocational training seem to have less incentives to continue their formal education.

Surprisingly all potential indicators of personality traits save one had to be excluded from the model, for only *self-reflexivity and willingness to learn* provided any contribution at all to the explanation of CVET participation, albeit the effect is an insignificant one. As was natural to expect, the influence of this predictor is positive since the minus sign is again caused by the encoding scheme used for this variable.

Among the category of attitudinal dispositions it is *mobility with regard to* CVET that shows the strongest direct influence and also the only significant effect, although the difference between total and indirect effect shows that the indirect effect is stronger (.244). It is interesting to notice that the direct influence in this case does actually point into a negative direction, which means that the higher the respondents' mobility (more precisely: the lower their demand or need for CVET near their workplaces), the lower are their participation rates, whereas the consequences of the indirect effect are the opposite.

With regard to the factor *quality of courses*, which has the strongest effect of the variables in the retained information dimension, the positive coefficient indicates that the worse the quality of CVET measures is evaluated (the more respondents disagree with the positively formulated items of which this factor is composed), the higher is the participation rate. Apart from the assumption that there exists a *reverse* causal relationship or rather a feedback loop in which the factor in question is itself a dependent variable of CVET participation, this observation also suggests that respondents take part in CVET measures despite possible inconveniences concerning organisational aspects because these may be outweighed by the long-term benefits of the courses. This hypothesis receives some support by the fact that the estimation of the general and the professional use (FAC3_6 and FAC2_1) both have a strong motivational effect, although their respective contributions are not significant. What also deserves some attention is the fact that the direct effects of these predictors are stronger than their indirect effects in accordance with the ISSTAL model, which is also the case for most situational variables.

Among this last group of predictors the indicator *variety of tasks* has the strongest direct effect and also the strongest effect of all variables in the model (-.368). We can see that a high degree of specialisation tends to increase participation in CVET. *Workplace needs* and *networks and technical infrastructure* (FAC1_2) are also quite influential. These results emphasize the importance of specific occupational requirements and the work environment in general for the shaping of educational behaviour. The crucial role of the company's size for their employees' opportunities to participate in CVET that was already mentioned in the previous section is confirmed by the present analysis, although the relatively strong effect (.226) fails to be significant.

On the whole, the model shows a strong effect of both the *social background* and the *situational aspects*, especially the work environment, whereas the individual *personality* appears to be less influential than expected. The role of *attitudinal dispositions* and *retained information* remains problematic to the extent that the possible interrelationships between the respective variables require further investigation. The model thus still has to be amended and further developed, especially in the light of the forthcoming interpretation of qualitative data.

# 2 Greece

*Nikitas Patiniotis, Olympia Kaminioti*

## 2.1 Introduction

While the subject of participation in education in general has received considerable attention in the research literature in Greece, the subject of training participation has not been studied extensively. The main reason for the lack of significant literature on the subject of training is found in the history of education and training development in the country. Both at the institutional and the personal level, education has strong roots in Greece while training – especially formal training – has received more attention recently, influenced to a great extent by European policy in the labour market and in other areas. Some of the characteristics of the labour market in Greece such as the high level of self-employment, the small size of businesses, many of which are family owned and organised, the rigid way in which the public sector is organised as well as a number of other social characteristics explain the small importance of (formal) training in the labour market.

The studies that address some issues of training participation in Greece have been discussed in a previous report (Patiniotis and Kaminioti 2002). This lack of studies on the factors influencing training participation and assessing the effects of training participation are an additional challenge to this project since reference material is always useful in the design of a similar project and the analysis of its outcomes.

In this report, we present the methodological approach used to examine the factors influencing training participation of technical employees in Greece, the analysis of official data and data we collected with surveys designed for the PARTICIPA project and finally we draw the conclusions from this stage of the analysis and make some policy recommendations about training participation. The structure of the report is as follows. In this introductory chapter we outline the research design and the methodology we use in the project. In the second chapter we present the analysis of official statistics on education and training participation in Greece over time. In the third chapter we present the analysis of two surveys on training participation of employees. The first one is addressed to employees from three sectors while the second one is addressed to employers of small businesses. In the fourth chapter we present the analysis of another survey aiming at investigating the extent of training participation of technical employees in Greece and examining the factors influencing it. Finally in the last chapter we draw the conclusions of all previous analyses and present some recommendations for the improvement of training practices in Greece.

## 2.2 Research Design and Methodology

### 2.2.1 Research design

This project focuses on the investigation of the factors that influence technical employees' participation in continuing vocational training. The initial research design for the project included a detailed questionnaire for business employees which aims to assess the importance of a number of factors affecting training participation.

At the beginning of the project, a number of issues directed us into adopting a broader framework. The lack of relevant literature in Greece and the small (formal) training participation in Greece influenced our decision in this direction. Therefore, we adopted a broader framework of investigation because we believe it will be helpful in better answering the more specific question on which the PARTICIPA project is focusing. The difficulty in strictly or objectively defining the professions that fit into the category "technical" provided an additional reason for adopting a broader framework.

As far as the specific proposed questionnaire was concerned, it was obvious from the beginning that because of its length and type of questions it would be difficult to be used in the Greek case. This assessment was proven correct by a pilot usage of the questionnaire. Employers were not easily willing to allow their employees feel the questionnaire while employees were frustrated by the difficulty in feeling the questionnaire.

These difficulties led us in the specification of the research design. It was clear that we needed to examine the attitudes towards training and the actual history of training participation of a number of employees with professions of varying degrees of technical involvement. Moreover we are interested in the whole training history of the employees (for example when they were unemployed) and not only in their training participation in their current employer.

Therefore, the project in Greece investigates the importance of three types of factors (and the interactions of these factors) on training participation and training attitudes. The three types of factors are: personal characteristics (demographic characteristics, educational characteristics, occupational characteristics, socio-economic background, etc), firm characteristics (sector, size, public/private, etc) and more general characteristics that refer to the institutional development and other social characteristics of the environment in which the firms are operating. The main question we want to answer is the extent and direction of each one of these factors and their combinations influences training participation and in particular training participation of technical employees. In other words we want to find out under which conditions people are encouraged or discouraged about participating in training. We believe that this analysis yields useful results for understanding the training practices in Greece. We also believe that this knowledge allows us to form relevant policy suggestions about improving the training process.

### 2.2.2 Methodology

The research questions were outlined in the previous section. The methodological tools that will be used to collect and analyse the relevant information include quantitative and qualitative tools. Within the objectives of the project, the selection of the specific methodology was influenced by the characteristics of the area under investigation and our aim to provide as much information as possible. Given these factors we decided to take the following steps:

- Analyse official secondary data on education and training participation
- Analyse field data from a business survey with a questionnaire to about 86 employees from three sectors about training participation of employees

– Analyse field data from a telephone survey to employers of small businesses concerning the training participation of their employees
– Analyse the results of a telephone survey with 605 technical employees about their
– training participation
– Analyse the data from 20 in-depth interviews with employees, employers, training
– providers and other relevant actors about training participation of employees
– Analyse the data from 2 focus – groups in two sectors (6-10 people) about training
– participation in these sectors
– Analyse the data of one case study in a company about the training policy of the
– employees in the company[7]

The questionnaire for the business survey was designed to include a number of questions covering the demographic characteristics, the educational and occupational characteristics of the respondents and their training history as well their attitudes towards future training participation. This questionnaire was answered by employees of three companies. The first company is a large very competitive private company which produces construction material, the second company is a large food company and the third company is a telecommunication company partly controlled by the state.

As already mentioned, the focus of the survey is the examination of the attitudes and the training history of employees. In this questionnaire we include all possible questions that were possible in order to examine the personal factors that either encourage or discourage training participation. The institutional factors that play a role in the process can only partly be examined with this questionnaire since the data comes from three companies and not from a larger number of companies with varying characteristics. However, some information will be collected on this issue with the survey because we ask employees about their overall training history and not only about their training experience in their present employer. The data collected with the questionnaire was coded, input into a database and analysed with SPSS.

The telephone survey was designed to a broader number of technical employees. In this case a self-determination method was used about whether someone was a technical employee or not. In the beginning of the interview, the prospective respondent was asked first whether s/he was employed and if yes, whether his/her occupation required technical knowledge or expertise. If there was a positive reply in both questions, the person was included in the sample and was asked to answer the remaining questions. This questionnaire aimed to collect data from a broader spectrum of sectors and occupations than the business survey. It includes a shorter number of questions and it adds useful information for the current project by approaching its questions from a different angle.

The business survey and the telephone survey were used to collect mainly quantitative information with the exception of some qualitative information collected with the business survey. In-depth interviews with mostly technical employees but also with employers and training providers will provide richer qualitative data about the factors facilitating or imped-

[7] The analysis of sections 5, 6 and 7 will be presented in another report.

ing training participation of technical employees. Given the size and the expected variability of the answers we can perform a number of statistical analyses with this data. This quantitative information will be nicely supplemented with data from about 20 in-depth interviews which will provide us with more detailed information on a number of critical questions. The interviews will include some of the employees that will fill the survey questionnaire and some other employees and employers from other companies. In the in-depth interviews there will be a wider representation of business characteristics (size, sector, public/private, etc). A number of in-depth interviews will involve professionals in the information technology sector.

The analysis of secondary data, mainly from the Labour Force Survey will provide some background information about formal training participation of employees with different personal and work-place characteristics. These data cover only formal training but cover a large sample of the Greek labour market and for this reason provide necessary background information for the assessment of the more specific project's results.

The in-depth interviews and the focus groups will provide qualitative information about the factors influencing training participation in Greece. Our aim is to involve several actors that participate from different roles in this part of the project, namely training providers, employers, employees and policy makers. We will concentrate on the existing situation and their implications for policy design.

Finally a case study will be done in one business which we consider a "model case" for training participation of technical employees. The case study will examine the training model of this company, compare it with previous models in other companies and in the same company in the past and try to identify first the extent of the success of this model for the specific company and second the elements that can be transferred to other situations.

## *2.3 Education and Training Participation in Greece Analysis of Official Statistics*

### 2.3.1 Introduction

In this paper we examine the extent of education and training participation of the Greek population in three time points: 1992, 1997 and 2002 using official statistics. We investigate the effect of several demographic and labour market characteristics on the level of education and training participation at the three time points.

The analysis is based on data from the Labour Force Survey which is a sample survey performed with harmonised methodology in all the EU countries. More specifically, the analysis is based on a question addressed to all respondents of the survey about whether they have participated in education or training four weeks before the survey. In 1992 and in 1997 the Labour Force Survey in Greece was a yearly survey that took place in the spring while in 2002 it became a quarterly survey. For comparability reasons we use the spring semester data for 2002.

Our main concern is studying training participation but we use this question that covers education and training for several reasons. The overall training participation in Greece is rather low and limiting the cases to those who participate in training alone would create problems in more detailed analysis in which we examine training participation in conjunction with other characteristics. The sample size decreases considerably when these characteristics are examined. Moreover, for many respondents in Greece and especially for studies beyond high school, the differentiation between education and training is not quite clear. There are some other problems related to this question, namely the proxy answers and the influence of the timing of certain training programs in the accuracy of the results. However, taking into account these limitations, we believe that we can still get a picture of the extent of education and training participation and the factors affecting it in Greece. Combining these results with results from other sources we can finally get a more accurate picture of the question under investigation. However, we should note that because of the limit the question poses on participating in education and training in the four weeks prior to the survey, the data concerning participation should not be interpreted as participation in a whole year but instead they show the extent of participation for the month prior to the survey. Having this under consideration, we can examine the factors that affect the chances of participating in education and training for respondents with different demographic and labour market characteristics.

The structure of the paper is the following. In the next section we examine the extent of education and training participation in the three time points (1992, 1997, 2002) by gender, age and marital status. Then we examine the effect of labour market characteristics on education and training participation. We investigate the effect of the position in the labour market (employed, unemployed, non-active), the effect of the position in employment (employee, self-employed, assistant in family business) and other characteristics such as full-time versus part-time, permanent versus non-permanent employment, private versus public sector job, size of business, job tenure, sector and occupation.

### 2.3.2 Demographic Characteristics

The overall education and training participation a month prior to the survey has not changed in the last ten years in Greece for the population 15 to 64 years old. This is a rather surprising result at first sight since the educational attainment has been raised for the overall population in the last ten years in Greece and someone may have expected that an overtime raise in the percentage of people participating in education and training would appear in these data. However, these changes may be hard to see at this aggregate level. The improvement of the overall educational level results from younger people studying more years; so when disaggregated data by age are examined we should see the result of the overall educational level improvement overtime for the younger people. As far as gender is concerned, there are no great differences in participation in education and training between men and women at this aggregate level. In 1992 and 1997 men participate slightly more than women while in 2002 even this small difference disappears. The results of education and training participation by gender in 1992, 1997 and 2002 are depicted in Tab. 1.

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| 1992 | 12.39% | 87.61% | 12.56% | 87.44% | 12.24% | 87.76% |
| 1997 | 12.65% | 87.35% | 12.74% | 87.26% | 12.57% | 87.43% |
| 2002 | 12.27% | 87.73% | 12.28% | 87.72% | 12.27% | 87.73% |

*Tab. 1 Education and training participation by gender (15-64 years old) in 1992, 1997, 2002*
*Source: Labour Force Survey, 1992*

In tables 2, 3 and 4 we present the results of education and training participation by age groups in 1992, 1997 and 2002 respectively. The effect of age in education and training participation is very strong at all three time points. In 1992 for the younger age group (15-19 years old) it reaches 78% and drops greatly at 29% for the 20-24 years old group. It becomes 5.8% for the 25-29 years old group and just 1% for people 30-44 years old and 0.2% for the 45-64 years old group. The range across age groups becomes even stronger in 1997 and 2002 because participation increases for the first two age groups. It seems that the overall improvement in the educational attainment that was not obvious in the aggregated data is depicted when we disaggregate the data with age. The chance of participation in education and training increases overtime for the younger groups and more specifically for the population up to 24 years old. From 25 years old and above there is a drastic drop in participation in education and training which becomes even more drastic after the 30$^{th}$ year of age. Education and training participation increases for men overtime but increases even more for women. In 1992 in the younger age group men participate in education and training by two percentage points more than women, in 1997 their participation is equal while in 2002 women participate more than men by two percentage points for the same age group. A similar trend is depicted for the second youngest age group. Overall it seems that education and training participation increases for younger people of both genders and that women at later time points participate more than men for these age groups. These trends disappear however after the 25$^{th}$ year of age.

These results depict the effect of the increased participation in the typical educational system for young people. However, this effect is only partly depicted in this data since a large number of Greeks go abroad to get an undergraduate or graduate degree. If these people were included in the data, the participation rates for the people 18-30 years old would have been even greater.

It is also worth noting that the increased participation of young women overtime in education and training is reflecting the changing attitudes of women towards the labour market and in general towards their position in society. However, unemployment statistics show that women of all age groups are hit harder by unemployment than men with equal qualifications. This situation perhaps gives an extra motivation to women to participate further in education and training in order to overcome the possible obstacles they face in entering the labour market.

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| 15-19 years old | 78.19% | 21.81% | 79.02% | 20.98% | 77.41% | 22.59% |
| 20-24 years old | 29.23% | 70.77% | 28.32% | 71.68% | 30.06% | 69.94% |
| 25-29 years old | 5.79% | 94.21% | 6.74% | 93.26% | 4.90% | 95.10% |
| 30-44 years old | 1.03% | 98.97% | 1.28% | 98.72% | 0.80% | 99.20% |
| 45-64 years old | 0.18% | 99.82% | 0.25% | 99.75% | 0.11% | 99.89% |
| Total | 12.39% | 87.61% | 12.56% | 87.44% | 12.24% | 87.76% |

*Tab. 2 Education and training participation by age (15-64 years old) in 1992*
*Source: Labour Force Survey, 1992*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| 15-19 years old | 82.27% | 17.73% | 82.28% | 17.72% | 82.26% | 17.74% |
| 20-24 years old | 31.94% | 68.06% | 30.73% | 69.27% | 32.96% | 67.04% |
| 25-29 years old | 5.17% | 94.83% | 5.70% | 94.30% | 4.68% | 95.32% |
| 30-44 years old | 0.67% | 99.33% | 0.81% | 99.19% | 0.54% | 99.46% |
| 45-64 years old | 0.08% | 99.92% | 0.10% | 99.90% | 0.05% | 99.95% |
| Total | 12.65% | 87.35% | 12.74% | 87.26% | 12.57% | 87.43% |

*Tab. 3 Education and training participation by age (15-64 years old) in 1997*
*Source: Labour Force Survey, 1997*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| 15-19 years old | 86.83% | 13.17% | 86.07% | 13.93% | 87.60% | 12.40% |
| 20-24 years old | 36.23% | 63.77% | 34.29% | 65.71% | 38.05% | 61.95% |
| 25-29 years old | 6.04% | 93.96% | 6.02% | 93.98% | 6.07% | 93.93% |
| 30-44 years old | 0.92% | 99.08% | 1.00% | 99.00% | 0.85% | 99.15% |
| 45-64 years old | 0.10% | 99.90% | 0.08% | 99.92% | 0.11% | 99.89% |
| Total | 12.27% | 87.73% | 12.28% | 87.72% | 12.27% | 87.73% |

*Tab. 4 Education and training participation by age (15-64 years old) in 2002*
*Source: Labour Force Survey, 2002*

The next demographic characteristic examined is marital status. Tables 5, 6 and 7 present the data of education and training participation for people 15-64 years old by gender in 1992, 1997 and 2002 respectively. The stronger participation in education and training is depicted by people who are not married. These are more often younger so behind the effect of marital status lies definitely the effect of age. It is interesting, however, that differences among men and women are stronger when marital status is considered. The difference among men and women is ten percentage points (women participate more often than men in education and training) in 1992 and 1997. The difference becomes even greater in 2002. It seems that women tend to participate more often than men in education and training when they are not married. These results show that there is an interaction effect between gender and marital status at all time points. Another interesting result is that overtime education and training participation of both men and women who are not married

decreases. This result requires more detailed analysis in order to be explained with security. A plausible answer is that overtime the decision to get married is delayed and therefore the decrease could be explained by the effect of age and less by the marital status itself.

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Not married | 40.50% | 59.50% | 35.95% | 64.05% | 46.09% | 53.91% |
| Married | 0.64% | 99.36% | 0.68% | 99.32% | 0.61% | 99.39% |
| Widow | 0.32% | 99.68% | 0.76% | 99.24% | 0.25% | 99.75% |
| Divorced | 1.60% | 98.40% | 2.20% | 97.80% | 1.34% | 98.66% |
| Total | 12.39% | 87.61% | 12.56% | 87.44% | 12.24% | 87.76% |

*Tab. 5 Education and training participation (15-64 years old) by marital status in 1992*
*Source: Labour Force Survey, 1992*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Not married | 38.97% | 61.03% | 34.44% | 65.56% | 44.45% | 55.55% |
| Married | 0.42% | 99.58% | 0.42% | 99.58% | 0.43% | 99.57% |
| Widow | 0.26% | 99.74% | 0.94% | 99.06% | 0.17% | 99.83% |
| Divorced | 0.50% | 99.50% | 0.46% | 99.54% | 0.52% | 99.48% |
| Total | 12.65% | 87.35% | 12.74% | 87.26% | 12.57% | 87.43% |

*Tab. 6 Education and training participation (15-64 years old) by marital status in 1997*
*Source: Labour Force Survey, 1997*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Not married | 35.72% | 64.28% | 30.84% | 69.16% | 42.16% | 57.84% |
| Married | 0.49% | 99.51% | 0.44% | 99.56% | 0.54% | 99.46% |
| Widow | 0.29% | 99.71% | 0.00% | 100.00% | 0.33% | 99.67% |
| Divorced | 0.78% | 99.22% | 0.70% | 99.30% | 0.82% | 99.18% |
| Total | 12.27% | 87.73% | 12.28% | 87.72% | 12.27% | 87.73% |

*Tab. 7 Education and training participation (15-64 years old) by marital status in 2002'*
*Source: Labour Force Survey, 2002*

### 2.3.3 Labour Market Characteristics

In this section we examine the effect of labour market characteristics on education and training participation. We first examine how position in the labour market affects participation in education and training for all respondents. The results show that there are great differences in the extent of participation in education and training for groups that have different positions in the labour market. Those who are not active in the labour market show the greatest participation as expected since the younger people who belong to this group are still at school. Employed people participate in education and training at very low rates around 1%. Unemployed people have higher participation than those employed and lower participation than the non-active population.

Participation of employed was 1.4% in 1992, 0.9% in 1997 and 1.2% in 2002. There is no upward trend but rather stability overtime with some fluctuations from one year to another. It is interesting, however, than in all three years women employees participate slightly more often in education and training than men employees do.

Unemployed people participate at higher rates in 1992 than 1997 and 2002. This downward movement in the rate of participation in education and training for unemployed could be attributed to the different timing of training programs from year to year.

Non-active participate in education and training at higher rates than the other groups at all three time points. Moreover, the difference in the rate between non-active men and women is remarkably lower for women than for men. This can be probably attributed to differences at older age groups; however, more detailed analysis is required for explaining such differences. The rate of participation for non-active women increases overtime but still remains about half the rate for men. The results on the rate of participation with respect to position in the labour market are presented in tables 8, 9 and 10 for 1992, 1997 and 2002 respectively.

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Employed | 1.41% | 98.01% | 1.29% | 98.71% | 1.64% | 98.36% |
| Unemployed | 7.93% | 92.07% | 8.56% | 91.44% | 7.52% | 92.48% |
| Not active | 27.28% | 72.72% | 48.15% | 51.85% | 19.39% | 80.61% |
| Total | 12.39% | 87.61% | 12.56% | 87.44% | 12.24% | 87.76% |

*Tab. 8 Education and training participation (15-64 years old) by position in the labour market in 1992*
*Source: Labour Force Survey, 1992*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Employed | 0.88% | 99.12% | 0.78% | 99.22% | 1.06% | 98.94% |
| Unemployed | 4.12% | 95.88% | 4.10% | 95.90% | 4.13% | 95.87% |
| Not active | 30.75% | 69.25% | 52.44% | 47.56% | 22.19% | 77.81% |
| Total | 12.65% | 87.35% | 12.74% | 87.26% | 12.57% | 87.43% |

*Tab. 9 Education and training participation (15-64 years old) by position in the labour market in 1997*
*Source: Labour Force Survey, 1997*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Employed | 1.15% | 98.85% | 0.99% | 99.01% | 1.39% | 98.61% |
| Unemployed | 3.41% | 96.59% | 3.31% | 96.69% | 3.46% | 96.54% |
| Labour force | 1.37% | 98.63% | 1.14% | 98.86% | 1.70% | 98.30% |
| Not active | 30.89% | 69.11% | 48.70% | 51.30% | 22.91% | 77.09% |
| Total | 12.27% | 87.73% | 12.28% | 87.72% | 12.27% | 87.73% |

*Tab. 10 Education and training participation (15-64 years old) by position in the labour market in 2002*
*Source: Labour Force Survey, 2002*

We then examine the effect of different employment characteristics on the rate of participation in education and training. When these characteristics are examined we consider the rate of participation for employed people 15 years and above. We first examine the effect of type of employment in the rate. In tables 11-13 we present the rates of participation for employees, self-employed people with and without employees and for assistants in family businesses.

Salaried employees show the highest participation in education and training compared to the other categories of employed. Women employees have the highest participation at all three time points compared to men employees. Self-employed people with employees have higher participation than self-employed people without employees. In most categories women self-employed show higher participation than men self-employed. People that work as non-paid assistants in family businesses participate more often in education and training than self-employed people but less than employees. In this category the participation of men is higher than the participation of women, perhaps indicating that this employment status is an initial step in the career more often for men than for women and therefore men are more often interested in upgrading their skills and competencies.

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Employees | 2.11% | 97.89% | 1.93% | 98.07% | 2.43% | 97.57% |
| Self-employed with employees | 0.63% | 99.37% | 0.56% | 99.44% | 1.11% | 98.89% |
| Self-employed without employees | 0.43% | 99.57% | 0.31% | 99.69% | 0.86% | 99.14% |
| Assistant in family business | 0.79% | 99.21% | 1.99% | 98.91% | 0.40% | 99.60% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 11 Education and training participation (15 years +) by position in employment in 1992*
*Source: Labour Force Survey, 1992*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Employees | 1.23% | 98.77% | 1.06% | 98.94% | 1.50% | 98.50% |
| Self-employed with employees | 0.29% | 99.71% | 0.30% | 99.70% | 0.28% | 99.72% |
| Self-employed without employees | 0.21% | 99.79% | 0.19% | 99.81% | 0.28% | 99.72% |
| Assistant in family business | 0.87% | 99.13% | 1.85% | 98.15% | 0.50% | 99.50% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 12 Education and training participation (15 years +) by position in employment in 1997*
*Source: Labour Force Survey, 1997*

| | Total | | Men | | Women | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Employees | 1.65% | 98.35% | 1.42% | 98.58% | 1.98% | 98.02% |
| Self-employed with employees | 0.39% | 99.61% | 0.40% | 99.60% | 0.32% | 99.68% |
| Self-employed without employees | 0.12% | 99.88% | 0.05% | 99.95% | 0.29% | 99.71% |
| Assistant in family business | 0.83% | 99.17% | 2.11% | 97.89% | 0.27% | 99.73% |
| Total | 1.11% | 98.89% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 13 Education and training participation (15 years +) by position in employment in 2002*
*Source: Labour Force Survey, 2002*

We also investigated whether full-time and part-time status and permanent and non-permanent employment status differentiate the extent of employed people's participation in education and training. In tables 14-16 we present the data showing the extent of education and training participation for full-time and part-time employees in 1992, 1997 and 2002 while in tables 17-19 we present the data showing education and training participation for permanent and non-permanent employees.

The question of full-time and part-time status is addressed to all employed people. It is answered in a subjective way. Respondents are asked whether they are working full-time or part-time considering the usual working hours at their profession. Participation in education and training is significantly higher for people working part-time than for people working full-time. In 1992, 1.2% of people working full-time and 5.7% of people working part-time participated in education and training while in 2002, 0.8% of people working full-time and 7% of people working part-time participated in training. It is interesting also to note that women who work full-time participate more often in training than men who work full-time. On the other hand, women who work part-time participate less often in education and training than men who work part-time. The higher participation of people working part-time could be attributed to their higher availability of time and other factors. It is possible that part-timers are more often younger people and people at an early stage in their career and for these reasons they tend to participate more often in education and training compared to other groups. And since the greater percentage of part-time work in Greece is involuntary[8], it is reasonable to assume that part-time workers are looking for better employment conditions and they participate in education and training more often than other employees in their effort to improve their qualifications.

The question of permanent or non-permanent status is addressed only to employees. The results show that non-permanent employees are participating more often to education and training than permanent employees. The reasons for this finding are probably similar to the reasons part-time employed people are participating more often than people working full-time. Permanent and non-permanent female employees participate more often than their

[8] Most part-timers would prefer to find full-time employment but accept part-time jobs because they cannot find full-time jobs.

male employees. Like part-timers, temporary workers are possibly participating in education and training at higher rates than other groups due to their effort to improve their qualifications and their chances of finding more favourable employment conditions.

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Full-time | 1.15% | 98.85% | 1.05% | 98.95% | 1.35% | 98.41% |
| Part-time | 5.71% | 94.29% | 8.09% | 91.91% | 1.35% | 98.65% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 14 Education and training participation of full and part-time employees (15 years +) in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Full-time | 0.72% | 99.28% | 0.62% | 99.38% | 0.90% | 99.10% |
| Part-time | 3.57% | 96.43% | 5.36% | 94.64% | 2.59% | 97.41% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 15 Education and training participation of full and part-time employees (15 years +) in 1997*
*Source: Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Full-time | 0.83% | 99.17% | 0.73% | 99.27% | 1.02% | 98.98% |
| Part-time | 7.05% | 92.95% | 10.98% | 89.02% | 5.23% | 94.77% |
| Total | 1.11% | 98.89% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 16 Education and training participation of full and part-time employees (15 years +) in 2002*
*Source: Labour Force Survey, 2002*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Permanent employees | 1.76% | 98.24% | 1.59% | 98.07% | 2.06% | 97.94% |
| Non-permanent | 5.16% | 94.84% | 4.88% | 95.12% | 5.67% | 94.33% |
| Total | 2.11% | 97.89% | 1.93% | 98.07% | 2.43% | 97.57% |

*Tab. 17 Education and training participation of permanent and non-permanent employees (15 years +) in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Permanent employees | 1.00% | 99.00% | 0.84% | 99.16% | 1.27% | 98.73% |
| Non-permanent | 3.08% | 96.92% | 2.96% | 97.04% | 3.24% | 96.76% |
| Total | 1.23% | 98.77% | 1.06% | 98.94% | 1.50% | 98.50% |

*Tab. 18 Education and training participation of permanent and non-permanent employees (15 years +) in 1997*
*Source: Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Permanent employees | 1.19% | 98.81% | 1.08% | 98.92% | 1.35% | 98.65% |
| Non-permanent | 5.28% | 94.72% | 4.59% | 95.41% | 6.03% | 93.97% |
| Total | 1.65% | 98.35% | 1.42% | 98.58% | 1.98% | 98.02% |

*Tab. 19 Education and training participation of permanent and non-permanent employees (15 years +) in 2002*
*Source: Labour Force Survey, 2002*

In the following three tables we examine the extent of education and training participation with respect to whether respondents work in the public or private sector. In general, participation is higher in the public sector than in the private sector. In 1992, participation in the private sector was 1.1%, in the public sector was 1.8% when only public services are included and 2.3% when we include semi-public organisations (public sector according to broad definition). Participation is especially high in state banks and/or banks controlled by the state (5.1% in 1992 and 6.9% in 2002). Participation of employees in state controlled banks in 1992 and in 2002 is responsible to a great extent for the high participation shown in the public sector defined in the broad sense in these years. In almost all categories women participate more than men because in general among employees participation of women is higher.

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Private sector | 1.13% | 98.87% | 1.03% | 98.97% | 1.30% | 98.70% |
| Public sector narrow | 1.84% | 98.16% | 1.69% | 98.31% | 2.07% | 97.93% |
| Public sector broad | 2.26% | 97.74% | 2.06% | 97.94% | 2.62% | 97.38% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 20 Education and training participation of employed (15 years +) by sector type in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Private sector | 0.74% | 99.26% | 0.64% | 99.36% | 0.91% | 99.09% |
| Public sector narrow | 1.38% | 98.62% | 1.43% | 98.57% | 1.31% | 98.69% |
| Public sector broad | 1.27% | 98.73% | 1.15% | 98.85% | 1.44% | 98.56% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 21 Education and training participation of employed (15 years +) by sector type in 1997*
*Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Private sector | 0.97% | 99.03% | 0.87% | 99.13% | 1.14% | 98.86% |
| Public sector narrow | 1.32% | 98.68% | 1.13% | 98.87% | 1.58% | 98.42% |
| Public sector broad | 1.64% | 98.36% | 1.34% | 98.66% | 2.07% | 97.93% |
| Total | 1.11% | 98.89% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 22 Education and training participation of employed (15 years +) by sector type in 2002*
*Source: Labour Force Survey, 2002*

The size of business and the extent it affects education and training participation is examined in tables 23-25. As expected, participation is higher in larger companies. The data do not allow for a detailed examination but we can distinguish two categories: companies with up to 10 employees and companies with more than 10 employees. In 1992, participation ranges from 1.2% in companies with up to 10 employees which are the majority of Greek companies to 2% in companies with more than 10 employees. Women participate more than men in all categories.

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Up to 10 employees | 1.15% | 98.85% | 1.03% | 98.97% | 1.37% | 98.63% |
| More than 10 employees | 1.99% | 98.01% | 1.87% | 98.13% | 2.21% | 97.79% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 23 Education and training participation of employed (15 years +) by size of business in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Up to 10 employees | 0.69% | 99.31% | 0.66% | 99.34% | 0.75% | 99.25% |
| More than 10 employees | 1.22% | 98.78% | 0.95% | 99.05% | 1.66% | 98.34% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 24 Education and training participation of employed (15 years +) by size of business in 1997*
*Source: Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Up to 10 employees | 0.93% | 99.07% | 0.88% | 99.12% | 1.02% | 98.98% |
| More than 10 employees | 1.42% | 98.58% | 1.11% | 98.89% | 1.92% | 98.08% |
| Total | 1.11% | 98.89% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 25 Education and training participation of employed (15 years +) by size of business in 2002*
*Source: Labour Force Survey, 2002*

We then examine the effect of tenure in the last job on training participation. There is an inverse relationship between tenure and participation in education and training. In 1992, participation in education and training is about 3% for people working five years or less in their current position, 1% for those working in their current position for 6-10 years and less than 0.4% for people working in their current position for more than 12 years. This pattern remains the same at all three time points. The relationship between tenure and education and training participation is depicted in tables 26-28.

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Five years or less | 2.89% | 97.11% | 2.76% | 97.24% | 3.09% | 96.91% |
| 6-10 years | 0.94% | 99.06% | 0.88% | 99.12% | 1.03% | 98.97% |
| More than 11 years | 0.37% | 99.63% | 0.37% | 99.63% | 0.37% | 99.63% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 26 Education and training participation (15 years +) by tenure in last position in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Five years or less | 1.98% | 99.76% | 1.73% | 98.27% | 2.33% | 97.67% |
| 6-10 years | 0.56% | 99.44% | 0.55% | 99.45% | 0.58% | 99.42% |
| More than 11 years | 0.24% | 99.76% | 0.24% | 99.76% | 0.23% | 99.77% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 27 Education and training participation (15 years +) by tenure in last position in 1997*
*Source: Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Five years or less | 2.41% | 97.59% | 2.20% | 97.80% | 2.69% | 97.31% |
| 6-10 years | 0.77% | 99.23% | 0.77% | 99.23% | 0.76% | 99.24% |
| 11-15 years | 0.32% | 99.68% | 0.25% | 99.75% | 0.45% | 99.55% |
| More than 15 years | 0.20% | 99.80% | 0.23% | 99.77% | 0.34% | 99.66% |
| Total | 1.11% | 98.89% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 28 Education and training participation (15 years +) by tenure in last position in 2002*
*Source: Labour Force Survey, 2002*

We finally examine the extent education and training participation of employed people changes across sectors and occupations. In tables 29-31 we present the sectoral data and in tables 32-34 the occupational data. As far as the sectoral data are concerned, there are considerable differences across sectors. In 1992, education and training participation ranges from 0.15% in agriculture to 3.32% in banking. The range is smaller among men than among women. For women in 1992 it ranges from 0% in mining to 4% in banking. In 1992, in agriculture, manufacturing, construction and transport/communication participation is lower than average, while in mining, electricity/gas/water supply, wholesale/re-

tail/restaurants, banking and other services participation is higher than average. In 1997 the only sectors that show higher than average participation are electricity/gas/water supply and wholesale/retail/hotels/restaurants. In 2002, wholesale/retail/hotels/restaurants, banking and other services have participation rates higher than average. Some of these fluctuations can be attributed to the timing of programs in certain sectors. However, it seems that service sectors have in general higher participation rates than agricultural and manufacturing sectors.

The examination of participation rates across occupations is not exactly comparable in 1992 and the later years because the occupation classification used changed at that year. In 1992 the occupations that show higher than average participation are managers, scientific occupations and office clerks. In 1997 and 2002 the occupations with higher than average participation are scientific occupations, technological occupations, office clerks and service clerks. Managers have lower than average participation because at this aggregate level, managers of large businesses as well as owners of small and very small businesses are included. Looking at more disaggregated data, we see that in 2002 the participation of managers in businesses with 10 or more employees participate at a rate above average (2.72%) while managers and owners of businesses with less than 10 employees participate at a rate significantly below the average (0.34%). Based on these disaggregated data not included in the tables presented here, the highest participation among men in 2002, have scientists (2.93%) and managers of businesses with more 10 or more employees (2.89) whereas the highest participation among women in 2002 have teaching assistants (7.27%), physicists/mathematicians who are not teachers (3.53%) and scientists (3.37%).

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Participated | Did not participate | Participated | Did not participate | Participated | Did not participate |
| Agriculture | 0.15% | 99.85% | 0.17% | 99.83% | 0.11% | 99.89% |
| Mining | 1.60% | 98.40% | 1.67% | 98.33% | 0.00% | 100.00% |
| Manufacturing | 1.08% | 98.92% | 1.07% | 98.93% | 1.11% | 98.89% |
| Electricity, gas, water supply | 1.80% | 98.20% | 1.90% | 98.10% | 1.26% | 98.74% |
| Construction | 0.62% | 99.38% | 0.63% | 99.37% | 0.00% | 100.00% |
| Wholesale, retail, hotels, restaurants | 1.62% | 98.38% | 1.64% | 98.36% | 1.58% | 98.42% |
| Transport, communication | 1.02% | 98.98% | 0.93% | 99.07% | 1.73% | 98.27% |
| Banking | 3.32% | 96.68% | 2.86% | 97.14% | 4.00% | 96.00% |
| Other services | 2.55% | 97.45% | 2.34% | 97.66% | 2.80% | 97.20% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 29 Education and training participation (15 + years old) by sector in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Agriculture | 0.16% | 99.84% | 0.16% | 99.84% | 0.16% | 99.84% |
| Mining | 0.20% | 99.80% | 0.21% | 99.79% | 0.00% | 100.00% |
| Manufacturing | 0.70% | 99.30% | 0.55% | 99.45% | 1.02% | 98.98% |
| Electricity, gas, water supply | 0.86% | 99.14% | 0.28% | 99.72% | 3.46% | 96.54% |
| Construction | 0.45% | 99.55% | 0.42% | 99.58% | 2.20% | 97.80% |
| Wholesale, retail, hotels, restaurants | 1.04% | 98.96% | 1.07% | 98.93% | 1.00% | 99.00% |
| Transport, communication | 0.75% | 99.25% | 0.52% | 99.48% | 2.24% | 97.76% |
| Banking | 1.78% | 98.22% | 1.35% | 98.65% | 2.31% | 97.69% |
| Other services | 1.35% | 98.65% | 1.28% | 98.72% | 1.43% | 98.57% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 30 Education and training participation (15 + years old) by sector in 1997*
*Source: Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Agriculture | 0.10% | 99.90% | 0.10% | 99.90% | 0.11% | 99.89% |
| Mining | 0.00% | 100.00% | 0.00% | 100.00% | 0.00% | 100.00% |
| Manufacturing | 0.90% | 99.10% | 0.93% | 99.07% | 0.81% | 99.19% |
| Electricity, gas, water supply | 0.91% | 99.09% | 0.49% | 99.51% | 3.36% | 96.64% |
| Construction | 0.79% | 99.21% | 0.72% | 99.28% | 4.44% | 95.56% |
| Wholesale, retail, hotels, restaurants | 1.37% | 98.63% | 1.34% | 98.66% | 1.42% | 98.58% |
| Transport, communication | 0.88% | 99.12% | 0.47% | 99.53% | 3.05% | 96.95% |
| Banking | 3.04% | 96.96% | 3.64% | 96.36% | 2.40% | 97.60% |
| Other services | 1.54% | 98.46% | 1.26% | 98.74% | 1.80% | 98.20% |
| Total | 1.11% | 99.15% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 31 Education and training participation (15 + years old) by sector in 2002'*
*Source: Labour Force Survey, 2002*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Managers | 2.11% | 97.89% | 2.04% | 97.96% | 2.60% | 97.40% |
| Scientific occupations | 3.56% | 96.44% | 3.20% | 96.80% | 4.03% | 95.97% |
| Office clerks | 2.87% | 97.13% | 2.75% | 97.25% | 2.98% | 97.02% |
| Sales employees | 1.30% | 98.70% | 1.27% | 98.73% | 1.35% | 98.65% |
| Service clerks | 1.24% | 98.76% | 1.57% | 98.43% | 0.82% | 99.18% |
| Agricultural workers | 0.13% | 99.87% | 0.14% | 99.86% | 0.11% | 99.89% |
| Technicians and machine operators | 0.73% | 99.27% | 0.73% | 99.27% | 0.71% | 99.29% |
| Total | 1.37% | 98.63% | 1.25% | 98.75% | 1.59% | 98.41% |

*Tab. 32 Education and training participation (15 + years old) by occupation in 1992*
*Source: Labour Force Survey, 1992*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Managers | 0.49% | 99.51% | 0.50% | 99.50% | 0.42% | 99.58% |
| Scientific occupations | 1.77% | 98.23% | 1.59% | 98.41% | 1.97% | 98.03% |
| Technological occupa-tions | 1.26% | 98.74% | 1.19% | 98.81% | 1.36% | 98.64% |
| Office clerks | 1.69% | 98.31% | 1.27% | 98.73% | 2.05% | 97.95% |
| Service clerks | 1.42% | 98.58% | 1.59% | 98.41% | 1.27% | 98.73% |
| Agricultural workers | 0.04% | 99.96% | 0.06% | 99.94% | 0.16% | 99.84% |
| Technicians | 0.57% | 99.43% | 0.56% | 99.44% | 0.60% | 99.40% |
| Machine operators | 0.30% | 99.70% | 0.29% | 99.71% | 0.37% | 99.63% |
| Unskilled workers | 0.40% | 99.60% | 0.69% | 99.31% | 0.12% | 99.88% |
| Total | 0.85% | 99.15% | 0.75% | 99.25% | 1.04% | 98.96% |

*Tab. 33 Education and training participation (15 + years old) by occupation in 1997*
*Source: Labour Force Survey, 1997*

| | Total employed | | Men employed | | Women employed | |
|---|---|---|---|---|---|---|
| | Partici-pated | Did not participate | Partici-pated | Did not participate | Partici-pated | Did not participate |
| Managers | 0.67% | 99.33% | 0.72% | 99.28% | 0.55% | 99.45% |
| Scientific occupations | 1.54% | 98.46% | 1.32% | 98.68% | 1.77% | 98.23% |
| Technological occupa-tions | 1.95% | 98.05% | 1.96% | 98.04% | 1.94% | 98.06% |
| Office clerks | 2.33% | 97.67% | 1.49% | 98.51% | 2.93% | 97.07% |
| Service clerks | 1.87% | 98.13% | 1.95% | 98.05% | 1.81% | 98.19% |
| Agricultural workers | 0.11% | 99.89% | 0.05% | 99.95% | 0.11% | 98.89% |
| Technicians | 0.92% | 99.08% | 0.99% | 99.01% | 0.37% | 99.63% |
| Machine operators | 0.30% | 99.70% | 0.34% | 99.66% | 0.00% | 100.00% |
| Unskilled workers | 0.44% | 99.56% | 0.70% | 99.30% | 0.22% | 99.78% |
| Total | 1.11% | 98.89% | 0.96% | 99.04% | 1.36% | 98.64% |

*Tab. 34 Education and training participation (15 + years old) by occupation in 2002*
*Source: Labour Force Survey, 2002*

### 2.3.4 Conclusions

In this paper we examine the extent of education and training participation, a month prior the survey, using the Labour Force Survey data for 1992, 1997 and 2002. We examined how demographic and labour market characteristics affect the level of participation. In this section we summarise the results and draw some final conclusions.

A main outcome of this investigation is that education and training participation overall does not change from 1992 to 1997 and 2002. When we consider the population 15-64 years old, it is around 12.5%. We also note that at this aggregate level there are no significant gender differences.

The age of respondents seems to affect to a great extent education and training participation. People 15-19 years old show a very high participation which increases further overtime. It starts less than 80% in 1992 and it becomes 87% in 2002. For the population 20-24

years old, it starts at 29% in 1992, it becomes 32% in 1997 and it reaches 36% in 2002. From the 25th year of age, participation in education and training drops significantly and does not change overtime. Moreover, young women tend to participate more in education and training than young men. These results depict the increased participation of young people in the educational system overtime. Young women's higher participation at more recent years is probably explained by the fact that women are trying to overcome greater barriers than men for successfully entering the labour market.

Marital status also affects the extent of education and training participation. Single respondents participate more often in education and training, partly because they are in general younger than the whole population. There is also an interaction effect between marital status and gender indicating that women tend to participate more often than men in education and training when they are not married.

Several labour market characteristics also seem to affect the extent of participation in education and training. When position in the labour market is concerned, we see that the highest participation rates are exhibited among the non-active population 15-64 years old as it is expected since students are a large part of the non-active population for this age group. This category shows a participation rate around 30% and an overtime increase in this rate. Great differences exist between men and women, attributed to a large extent to higher number of non-active women at older age groups. Unemployed people participate in education and training at 8% in 1992, 4% in 1997 and 3% in 2002. This decrease in the rate could be possible explained by the timing of training programs for this category. There are no differences in the participation rates of unemployed people among men and women according to our data. Employed people show the lowest participation rates compared to non-active and unemployed. They participate in education and training at a rate around 1%. Women participate at higher rates than men when employed.

Among employed people, salaried employed people participate more in training than other categories. Assistants in family businesses follow, while self-employed with employees participate less and self-employed without employees participate even less. The same pattern exists at all three years. Among employees, women have a higher participation rate while among assistants in family businesses, men participate more than women.

Part-time employees participate more in education and training than full-time employees. Among them women participate more than men. Part-time employees are often young people or people at an early stage in their career, so these trends are expected since part-time employment in Greece is mostly involuntary. Therefore people who work in part-time jobs have more reasons to participate in education and training in order to improve their qualifications and their chances of finding better employment. Similar trends exist among permanent and non-permanent employees. Non-permanent employees have a higher participation rate compared to permanent employees. Again women participate more often than men due to the fact that in general among employees women have a higher participation rate.

Differences also exist between private and public sector employees. In general in the public sector participation rates are higher. In the public sector defined broadly, participation is

even higher. In most categories, women participate more than men. Moreover, in larger businesses participation is higher than in smaller businesses. As far as tenure is concerned, we noticed an inverse relationship between participation and tenure. This trend remains stable overtime.

Finally we examined sectoral and occupational differences in education and training participation. According to the results, in the primary sector participation rates are the lowest while in the service sector the highest. Occupations that show the highest participation are scientific occupations and managers in large corporations.

## *2.4 Training Participation of Employees*

### 2.4.1 Introduction

In this chapter we present the results of two surveys examining the extent and the factors influencing training participation of employees in Greece. More specifically the first survey is a business survey of employees from three companies aiming at examining the extent of their participation in training, their evaluation of training and the factors that facilitate or obstruct training participation. The questionnaire is included in the appendix of this chapter. The second survey is a telephone survey of employers of small businesses acquiring their interest in their employees participating in subsidised training programs. In these small companies according to official statistics training participation in Greece is especially low. With this survey we are interested in verifying some of the findings of official statistics under special conditions such as the provision of state subsidies for the participation of employees and investigate the extent of which they affect training participation.

In the subsequent section we present the results of the business survey, starting with the quantitative results and continuing with qualitative results to the open-ended questions of the survey. In the next section we present the results of the telephone survey. In the final section we summarise the results and draw the main conclusions of the analysis.

### 2.4.2 Results

#### About the survey

The business survey was designed for the purposes of the Participa project to examine the extent of training participation of employees and the factors that are affecting training participation. The questionnaire includes questions about the demographic characteristics of the respondents, their training participation while unemployed and employed, their evaluation of training programs and their opinions about the factors than encouraged or discouraged their training participation. The questionnaire was distributed to employees from three different sectors, namely construction material production, food products and telecommunications. From all sectors we collected 86 questionnaires. Before we comment on the results, we shortly present the characteristics of these sectors.

### The construction non-metallic material sector and the cement sub-sector

The sector of non-metallic mineral employees about 17,400 people in 500 companies[9]. It produces 5.8% of the total domestic product, it has 7.3% of the total employment and accounts for 4.2% of exports. It includes 8 sub-sectors of which the cement sub-sector is the most important one since its contribution in the production of the sector is 46%. The average employment size per company in the sector decreased from 37 to 35 people in the period 1986-1999.

The cement sub-sector has been developing due to the major infrastructure work that is taking place in the last decade in Greece, the infrastructure for the Olympic Games of 2004 and exports. It may face some restructuring problems in the near future since cement is used less in construction and new material or new types of cement take its place. Titan is the largest company in the sector and one the three most profitable companies in Greece (with regard to total profits). It is for the last century one of the ten largest private industrial companies in Greece and today is the only Greek-owned cement company.

### The food sector and the oil products' sub-sector

The food sector is a large and developing sector of the Greek economy. The sector contributes significantly to Greek exports. Demand in Greece is not expected to rise in 2002 but certain products that are exported are expected to face increased demand. The importance of Mediterranean diet all-over the world is expected to help the exports of the Greek food products. The food sector includes 9 subsectors and has about 40.000 employees in 900 companies[10]. It produces 18.8% of the gross industrial product, it has 21.6% of the total employment and 5% of the total exports. In the last decade has been developing every year and its development is faster than the development of the industry overall. Between 1986 and 1999 the employment per industrial unit has increased from 41 to 46 people. Since then the average size of employment in the companies of this sector has not changed. Elais is one of the ten largest companies in the food sector.

Oil producing in Greece is impressively large. The industry of oil production is a considerable industry, which supplies the Greek market and exports part of its production. According to a study of the Institute of Economic and Industrial Research (IOBE) the sector is facing some structural problems that undermine its further development. These problems include the large number of producers and industrial establishments which due to their small size are encountering higher costs and in certain cases they lack a total quality management approach[11]. The danger that exists is that even though the Greek olive oil products are of higher quality that the olive oil products of other countries, the cost of Greek oil is considerably higher and is not marketed in an appropriate way which may result in a smaller portion of the international and even the domestic market in the coming years.

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[9] The Greek Economy, 2001, Taseis, in Greek, p. 296.

[10] The Greek Economy, 2001, Taseis, in Greek, p. 244.

[11] Zampounis V., IOBE, 2001, "The Greek Market of Olive Oil", in Greek.

## The telecommunications sector

According to a recent study of KEPE sited in Vima newspaper (Sunday 24-11-02) during the period 1992-2000 all quality and quantity indicators about telecommunications improved dramatically in Greece. There was a considerable increase in number of companies in this sector and employment also increased four times more than in the whole economy. The increase of employment in the telecommunication sector was 20% for the period 1992-2000 compared to an increase of 5.6% in the whole economy. 32.478 people were working in the sector in 2000 which is 0.82% of total employment. However, it is still a small sector. It is a capital-intensive sector and this characteristic becomes even stronger lately.

Ote used to be the only company offering non-mobile connections but now it is facing some but still small competition in this area. In the area of mobile connections, OTE is facing with increased competition from other companies. In 2000 it employed 60.6% of the employees in the sector. In the period 1992-2000 its personnel decreased by 16.3% due to the increased automatisation of production and restructuring of its services.

Mobile phone companies in 2000 employed 9.1% of the employees of the sector. In the period 1992-2000 their employment increased by 258.4%. But in absolute numbers the increase is small (3.500 positions).

The remaining companies of the sector employ 30.3% of the employees of the sector. In the period 1992-2000 their employment increased by 287.4%.

## Quantitative results of the survey

In this section we present the quantitative results of the business survey including the responses of the employees from all sectors. In this chapter we present these initial results while more detailed analysis of the results is taking place and will be presented in following papers. Starting with the gender composition of our sample, men are overrepresented compared to women but this corresponds to their share of employment in the Greek labour market. Tab. 35 presents the gender composition of our sample.

| | |
|---|---|
| Men | 65.9% |
| Women | 34.1% |
| Total | 100.0% |

*Tab. 35 Gender composition of employees*

In tables 36 and 37 we present the age structure and the marital status of the employees in the sample. The respondents in our survey seem to be relatively young compared to the employed population of Greece. Their young age is also depicted in the marital status table.

| | |
|---|---|
| 25-33 years old | 31.0% |
| 34-41 years old | 26.2% |
| 42-49 years old | 20.2% |
| 50-56 years old | 22.6% |
| Total | 100.0% |

*Tab. 36 Age structure of employees*

The average of age is 40. 43 for men and 36 for women.

| | |
|---|---|
| Single | 34.1% |
| Married | 61.2% |
| Divorced | 4.7% |
| Total | 100.0% |

*Tab. 37 Marital status of employees*

In table 38 we present the educational status of the employees in the sample. The educational level of our respondents is high compared to the employed population in Greece.

| | |
|---|---|
| High school | 8.3% |
| University | 63.4% |
| Graduate degree | 28.3% |
| Total | 100.0% |

*Tab. 38 Educational level of employees*

In table 39 we present the typical working hours of our respondents. The structure depicted is typical of the Greek employed population. It is worth noting the very low level of part-time work and the relatively high number of weekly working hours.

| | |
|---|---|
| Up to 25 hours | 6.0% |
| 26-40 hours | 33.3% |
| 41-50 hours | 53.6% |
| more than 50 hours | 7.1% |
| total | 100.0% |

*Tab. 39 Working hours of employees*

In table 40 we present the results of the question asking respondent the way in which they learned to practice their profession. As it is seen in the table, most of them rely on special studies while a significant number of them relies mostly on experience from their current position.

| | |
|---|---|
| Special studies | 61.4% |
| From present position | 32.5% |
| From previous positions | 6.0% |
| Total | 100.0% |

*Tab. 40 How employees learned to practice their profession*

In tables 41 and 42 we present the results to two questions with which we are trying to determine the extent of which the occupations of our respondents are technical. In table 8 we show the extent of technology use at work. According to the responses, only 4.8% claim that their use of technology is low or very low. So according to this definition most of our respondents could be classified as technical employees. In table 9 we present the answers to a question addressed to all employees asking them to "what extent they consider their occupation as technical". According to the responses in this question, about 35% of the em-

ployees in the sample claim that their occupation is not technical while an additional 21% cannot characterise it either as technical or not technical. This question limits further than the previous one the technical occupations.

| | |
|---|---|
| Very low | 1.2% |
| Low | 3.6% |
| Medium | 8.4% |
| High | 31.3% |
| Very high | 55.4% |
| Total | 100.0% |

*Tab. 41 Use of technology at work*

| | |
|---|---|
| 1 (not very technical) | 17.9% |
| 2 | 16.7% |
| 3 | 21.4% |
| 4 | 19.% |
| 5 (very technical) | 25.0% |
| Total | 100.0% |

*Tab. 42 To what extent you characterise your occupation as technical*

In table 43 we present the extent of training participation of our respondents while they were unemployed while in the following table 44 we present their evaluation of these programs according to several criteria. While unemployed 13% of respondents have participated in training programs. The evaluation of these programs is quite positive for most criteria. With respect to acquiring professional knowledge, social skills and skills useful for finding employment the evaluation is very positive. On the other hand, less positive is the evaluation concerning labour market prospects, the financial situation and the personal interests of the respondents. The results show that the content of the programs is positively evaluated by trainees but at the same time it is understood that these training programs are not able to alter labour market prospects. It seems that trainees realise the usefulness of training programs and at the same time their limitations especially with respect to creating employment.

| | |
|---|---|
| Yes | 13.3% |
| No | 86.7% |
| Total | 100.0% |

*Tab. 43 Participation in training program for unemployed*

| | Negative | Indifferent | Positive |
|---|---|---|---|
| Evaluation concerning acquiring professional knowledge | 9.1% | 27.3% | 63.6% |
| Evaluation concerning acquiring social skills | 9.1% | 27.3% | 63.6% |
| Evaluation concerning skills for finding employment | 9.1% | 27.3% | 63.3% |
| Evaluation concerning labour market prospects | 27.3% | 36.4% | 36.4% |
| Evaluation concerning your financial situation | 18.2% | 45.5% | 36.4% |
| Evaluation concerning personal interests | 18.2% | 36.4% | 45.5% |

*Tab. 44 Evaluation of training programs for unemployed*

In table 45 we present the extent of training participation of respondents in programs designed for the employed. We see that the great majority of them have participated in such programs. Since our respondents are more educated and younger than the general employment population, we expect that the participation rates of other employees would be lower than those reported here.

| | |
|---|---|
| Yes | 63.1% |
| No | 36.9% |
| Total | 100.0% |

*Tab. 45 Participation in training program for employed*

In table 46 we present the results of the evaluation of training programs for employees with respect to several criteria. For all factors except for improving the financial situation, the evaluation is very positive. Respondents seem to be especially satisfied with the quality of programs concerning the acquisition of professional knowledge, social skills and their prospects within their company. It is also worth noting that training programs for the employed seem to satisfy their interests to a much greater extent than the training programs for the unemployed did.

| | **Negative** | **Indifferent** | **Positive** |
|---|---|---|---|
| Evaluation concerning acquiring professional knowledge | 5.7% | 13.2% | 81.2% |
| Evaluation concerning acquiring social skills | 7.7% | 23.1% | 69.3% |
| Evaluation concerning collaboration on the workplace | 11.3% | 13.2% | 75.5% |
| Evaluation concerning the operation of the business | 11.5% | 19.2% | 69.2% |
| Evaluation concerning prospects in the same company | 9.6% | 19.2% | 71.1% |
| Evaluation concerning prospects outside the specific company | 7.8% | 27.5% | 64.7% |
| Evaluation concerning your financial situation | 23.1% | 44.2% | 32.7% |
| Evaluation concerning personal interests | 11.5% | 63.5% | 88.5%(?) |

*Tab. 46 Evaluation of training programs for employed*

Besides participation in work-related training programs, we asked respondents whether they have participated in other training programs in their free time. In table 47 we show the extent of their participation in these additional programs and in table 48 we show their evaluation of these programs. We see that a quarter of all respondents have participated in these additional programs. Their rating is very high for all criteria, including the labour market criteria.

| | |
|---|---|
| Yes | 25.7% |
| No | 74.7% |
| Total | 100.0% |

*Tab. 47 Participation in other training programs*

| | Negative | Indifferent | Positive |
|---|---|---|---|
| Evaluation concerning acquiring professional knowledge | 16.0% | 8.0% | 76.0% |
| Evaluation concerning acquiring social skills | 16.0% | 32.0% | 52.0% |
| Evaluation concerning labour market prospects | 12.0% | 16.0% | 72.0% |
| Evaluation concerning your financial situation | 32.0% | 44.0% | 24.0% |
| Evaluation concerning personal interests | 8.3% | 62.5% | 29.2% |

*Tab. 48 Evaluation of other training programs*

The overall participation rate in training programs for the employed in this sample is very high. We asked, however, the reasons that have possibly obstructed participation and we present these reasons with the frequency reported in the sample:

Reasons for lack of participation in training

– I never had time for training. 5
– Training is a waste of time. 0
– Training is good but I have to take care of my family 4
– I could never leave my job to participate in training. 6
– Whether I get training or not I will do the same job. 1
– Employers do not appreciate training 7
– At work the important thing is to be smart and to catch up fast. That's what really matters, not training. 2
– Training does not help; but you should be able to understand what the boss wants and to be able to do it. 1
– Since my salary is not going to increase, why should I do the training? 1
– I have a lot of experience and I don't need training. 2
– I wanted to participate in training but my supervisor did not approve my request. 4
– It was suggested to me by my supervisor to participate in a seminar but it was not in the area I was interested in and I refused. 2
– I prefer to learn on my own. 4
– Sometimes seminars are not organised well and they do not offer the knowledge they are supposed to. 7
– I would like to participate in seminars but someone else should cover the cost. 11
– My supervisor never suggested to me that I could participate in training. 12

The responses indicate that a number of non-participants could be participants under certain circumstances. A main obstacle seems to be lack of time and financial resources. Another group of obstacles includes family obligations and work obligations. The attitudes towards training are better depicted in table 49 in which we present respondents' opinions about further training. According to these results only a very small percentage of employees consider training not useful.

| | |
|---|---|
| Not useful | 3.8% |
| Indifferent | 3.8% |
| Useful | 92.5% |
| Total | 100% |

*Tab. 49 Table Attitudes towards further training*

In tables 50, 51 and 52 we present the participation rates of respondents disaggregated by gender, age and educational level respectively. The period of participation covers all their working life. These results show that men participate more than women, employees 42-49 years old participate more than the remaining respondents and that university graduates participate higher than the other respondents. These are not typical results for training participation rates in Greece. A possible explanation is that they are different because of the overall high participation rate in our sample.

| | **Men** | **Women** | **Total** |
|---|---|---|---|
| Yes | 65.5% | 58.6% | 63.1% |
| No | 34.5% | 41.4% | 36.9% |
| Total | 100% | 100% | 100% |

*Tab. 50 Training participation by gender*

| **Age (years)** | **25-33** | **34-41** | **42-49** | **50-56** |
|---|---|---|---|---|
| Yes | 61.5% | 63.6% | 82.3% | 47.4% |
| No | 38.5% | 36.4% | 17.7% | 52.6% |
| Total | 100% | 100% | 100% | 100% |

*Tab. 51 Training participation by age*

| | **High school** | **University** | **Graduate degrees** |
|---|---|---|---|
| Yes | 50% | 64.8% | 62.5% |
| No | 50% | 35.2% | 37.5% |
| Total | 100% | 100% | 100% |

*Tab. 52 Training participation by educational level*

Finally in tables 53 and 54 we present participation rates of employees disaggregated by the two questions we used to define technical occupations. According to the extent of which respondents consider their occupation technical, there is no clear pattern. According to the definition about the use of technology, those who exhibit the highest use of technology show the highest participation, followed by those claiming not to use technology to a high degree.

| | **less technical 1** | **2** | **3** | **4** | **more technical 5** |
|---|---|---|---|---|---|
| Yes | 60% | 64.3% | 61.1% | 75% | 57.1% |
| No | 40% | 35.7% | 38.9% | 25% | 42.9% |
| Total | 100% | 100% | 100% | 100% | 100% |

*Tab. 53 Training participation by the extent of which employees consider their occupation technical*

| | Very low and low use | Average use | High and very high use |
|---|---|---|---|
| Yes | 50% | 28.6% | 66.2% |
| No | 50% | 71.4% | 33.8% |
| Total | 100% | 100% | 100% |

*Tab. 54 Training participation by use of technology at work*

## Qualitative results from the business survey

In this section we present the qualitative results of the survey which were collected with open-ended questions. We start with the answers to question 35: "For which reasons do you consider either useful or useless your participation in training programs for employees?" Before listing the answers to this question we should say that mostly positive answers were recorded. The different answers reported are the following:

- Acquiring knowledge is always positive in the building of someone's personality and his/her ability to respond well to highly demanding working environments
- There is a big time lag in the market in absorbing highly qualified professionals and the use of specialised knowledge
- Helps with management techniques, organisation of time and tasks, training of staff
- To be updated on new information, technology
- Improve efficiency for myself and my company
- Do your job easier
- Opens new perspectives
- Occupational information, especially new technology
- Science does not stop. Always moves on. If the program is of some quality, it helps you get informed, develop your skills, solve problems
- Professional development
- Contact with people with similar professional interests, exchange of experience, professional knowledge
- Rapid changes in technology so training is necessary to perform the job
- It would have been useful if it covered something relevant to the position and mainly technical issues.
- It increased efficiency
- Useful because it opens economic and working prospects
- Technology changes are extremely fast so every employee is obliged to be informed whether or not s/he uses the specific knowledge
- Better prospects for moving up in hierarchy
- It is useful because this is the way I acquire specialised knowledge
- Improvement of personal and professional skills
- Technology and working arrangements change, so it is necessary
- Development of personal skills
- Personal development
- You take ideas of how to handle situations; you take advantage of other people's experience

- Training supplements the experience you get from working
- It improves employability prospects
- In technical jobs training is necessary
- Improvement of general knowledge
- Development of social skills, collaborating with people
- Useful for acquiring new skills, knowledge, abilities
- Some of the skills training can help me develop, I cannot develop any other way
- It helps me perform in a competitive market
- Opens new employment prospects
- Employability
- It is useful for me personally even though the acquired knowledge cannot be applied in the current company

The factors that are affecting the usefulness and impact of training programs for employees are the following. The results are from the open answers of question 36 of the business survey.

- The recognition of real training needs
- The establishment of the focus, the content, the structure of the training, the trainers, the organisation and the evaluation of the seminar
- Teaching ability of trainers
- Correct selection of programs (content)
- Correct organisation and performance of programs (trainers, organisation, etc)
- It is very important that the seminar covers the requirements of a specific position and the training needs of the participant and that the timing of the seminar is chosen carefully, not too early and not too late after taking a position
- The reliability of the training provider
- The support of the employee by the company for participating in the program
- Coverage of requirements of employees in broader terms than the current position
- Combination of theory and practice
- To provide updated information
- To have small duration since employees do not have much time or interest in participating in long programs
- Knowledge and experience of trainers
- Responsibility of trainers
- It should develop skills and offer practical knowledge
- Teaching methods
- It should offer information that the employee can put into practice within a short time
- Offering skills and knowledge that promote lifelong learning
- More practical than theoretical
- Cost
- Specialised training
- The personal interest of the trainee
- The training environment

– Current information that has been proven useful in practice in other environments
– Whether or not the company is going to take advantage of the skills and knowledge
– acquired by the employee
– Transfer of new ideas and use of technology
– The participation of trainees in the program
– The acceptance and recognition of the program

Finally we present the suggestions of respondents about the improvement of training for employees which were reported in question 37.

– Continuing training should be aiming at providing occupational knowledge and at the same time satisfy the more general interests of employees. It should be pleasant and provide a broader framework.
– The training programs should have a theoretical and practical part. Knowledge provided should be in a form that can be used by participants.
– Training providers should have besides theoretical knowledge, job experience in what they are teaching.
– Training sessions should be as homogeneous as possible.
– Training should give information that is currently needed in the labour market.
– Training should be flexible in terms of hours in order to fit the schedule of working people.
– An analysis of the job profile should take place first and then the program should be designed to fit this occupational profile.
– The design of sectoral training programs would be beneficial.
– It is useful to combine training with practice in real work environments.
– The selection of trainees and trainers is the most important aspect.
– The success of a program is determined by how it combines the following characteristics: organisation, specialisation, flexibility and low cost.
– Trainers should be people that are working in the area they are teaching and not academics.
– Programs should be evaluated and the feedback used to improve future ones.
– The ability of trainers and their experience in teaching is crucial for transferring their knowledge.
– Participation of trainees during training should be encouraged.
– The connections between training material and the job of trainees is important.
– Training programs for employed should give them special occupational knowledge.
– Employees should be better informed about available training programs.
– Training programs should have clear objectives about what they are trying to achieve.
– Training should provide skills that enable employees to perform better at their job.
– Employees should be motivated to participate in training programs.
– Employers should be motivated to encourage the training of their employees.
– Long distance training programs can be offered for several subjects.
– Accreditation of trainers and the training programs is necessary.

## Results of the survey of employers from small businesses

In this section we present the results of a survey with employers of small businesses about the training participation of their employees. Training participation of employees in Greece is very low. Training participation in small companies is significantly lower than in larger companies. The Greek state is trying to encourage training participation in companies with 1-20 employees with a number of subsidised training programs addressed to the employees of these companies. The system works in the following way. Each year a number of these programs are announced and training providers according to certain criteria get a share of these programs. Each training provider then announces the provision of a specific program and selects the trainees from the applications of interested companies. The criteria which a company should satisfy in order to be able to apply for the participation of its employees in these programs are the following:

- They cannot lay off the employees participating in the training while the program is running
- They should not owe money for insurance benefits
- The proposed employees cannot participate in more than one subsidised training program at the same time
- The proposed employees cannot participate in more that two subsidised training programs within a calendar year.

It should be noted that the training is provided in evenings so it does not interfere with the operation of the business or at least the interference is minimised as much as possible. Moreover, the employees who participate in the training program earn a sum of money as an extra motivation to participate in training and of course they earn their regular salary from their workplace even in the case that they have to miss some hours because of the training. The employees have to be referred to the training provider by the company owner or the company director. That is, the approval of the company owner or the company director is required in order for the employee to participate. It is assumed that the company would benefit from better trained employees and from the fact that the training is provided to them free of charge. On the other hand, the participating employees receive an amount of money as an extra motivation to participate in the program. Of course, during the time the training program is taking place, the employees receive their regular salary even in the case they have to be absent from their work in order to attend the program.

In most of the cases of subsidised programs, in Greece there is a high competition among individuals and/or companies in order to guarantee their participation in the programs. In this effort social and political networks are extensively used by prospective participants. Someone could expect that the same situation exists in the case of these training programs. To answer this question we asked one training provider to provide us with data that would answer the question.

We examined the data that show the extent of interest of small companies for a training program in information technology and more specifically on tools that can be used for self-learning such as the internet. The program was "advertised" in the audience of small companies and then the training provider was trying to enlist interested companies from a cata-

logue of 5,500 companies by calling each company and informing them individually about the program. The following table shows the results of these telephone conversations between the training provider and the companies. It should be noted that from the total number of 5,500 companies only 3,045 companies gave an answer about whether they were interested, not interested or not decided yet. In the remaining cases, either the phone has been changed or the company has closed or the company had more that 20 employees or no employees at all so it did not quality for participating in these programs.

| Interested | Not interested | Unclear | Total |
|---|---|---|---|
| 869 | 1,457 | 719 | 3,045 |
| 28.5% | 47.9% | 23.6% | 100% |

*Tab. 55 Level of interest in participating in subsidised training programs for small businesses (1-20 employees)*

The table records not the actual interest of the relevant companies but their initial intent towards the program. It is safe to assume that more companies would show initial interest in the program and then decide not to participate than the other way around.

The results are very interesting. About half of the companies clearly show their lack of interest in participating in the programs. The remaining half of the companies are almost divided between those that show initial interest and those that are undecided. In most cases the reason for which they are not interested is not recorded but in some cases the lack of available time is offered as one of the reasons. There are some cases that companies showed anger or irritation for being bothered with the question. In the cases of undecided companies either the person responsible for providing an answer was not present or they want to think about it for a while before they give an answer.

The lack of interest in training participation is even more brutally underlined when the data about the actual applications the training provider received after all these phone calls. It actually received applications from 14 companies requesting participation for 29 employees.

### 2.4.3 Conclusions

In this chapter we presented the results of two business surveys: one addressed to employees and the other to employers of small businesses. The aim of the analysis is to investigate the extent of training participation of employees with special emphasis on technical employees trying to identify the factors that influence this participation either positively or negatively.

Overall training participation in Greece is low according to official statistics. The results of the two surveys presented here show two sides of the same picture. The first business survey of employees in the three sectors shows very high participation rates of employees and very positive attitudes of respondents towards further training. This sample is not representative of the Greek labour market but is drawn from developing companies in specific sectors. Even though the analysis of these data is not completed, we can conclude that for these respondents included in the sample there is a high personal motivation factor to participate in training and at the same time they are working in environments that facilitate or demand such participation.

On the other hand, the survey of employers of small companies shows their lack of interest for the training participation of their employees. This negative picture is explained by several factors. One factor is the operational difficulties these companies are facing, which make it very difficult for employees to be absent for any reason. Moreover, owners of these companies are often not very educated or appropriately educated on how to improve the functioning of their company. Finally the quality of programs offered by the state may be evaluated negatively with respect to the needs of its company.

But even if these two surveys show the two extremes of the Greek labour market with respect to training participation of employees, they are very useful in yielding results for understanding the different aspects of training participation in Greece and for drawing meaningful conclusions about the improvement of the existing situation. The recommendations are presented in the final chapter of this report.

## *2.5 Training Participation of Technical Employees*

### 2.5.1 Introduction

In this chapter we present the results of a telephone survey designed by the University of Patras for the requirements of the Participa project. We collected data that enabled us to examine the extent and the factors influencing training participation of technical employees in the Attica area. The sample was selected randomly with quota about the geographic representation of the population and gender representation. It included 605 employed people from the Attica area who are technical employees according to their own definition of the term. The survey took place in the 8th and 9th of April 2003.

With this survey we recorded the demographic, educational and occupational characteristics of respondents, the extent of their participation in training programs, factors that facilitate or obstruct their participation in training programs and the way they evaluate training programs. The original question asked was if the person was employed and the second one if s/he employed in a technical profession. When a negative answer was given in either of these questions, the interview was terminated. The distinction between technical and non-technical occupations was very difficult for many respondents; in these cases they were asked whether their job requires technical knowledge or not. The whole questionnaire is included in the appendix. In the following section we present the results of the survey and in the third section we underline the main conclusions derived from the analysis of the data concerning the extent and the factors affecting training participation of technical employees in the Attica area.

### 2.5.2 Results

The respondents of the survey were 605 employed people in technical occupations in the Attica area. Whether or not a job was technical was decided by the respondent based on the term itself and when in doubt based on whether or not it required technical knowledge. In either case, it was subjectively defined by the respondent. Given the ambiguity or the many possible ways the term "technical occupation" can be defined, we preferred to adopt the subjectivity of the way the term is understood by respondents.

A comparison of the demographic characteristics of the sample and the demographic characteristics of the Greek employed population reveals that certain discrepancies exit between the two, most important of which are the higher educational level and the overrepresentation of women in our sample. Given the sample design, these discrepancies are meaningful for the following reasons. The sample included employed people from Attica where the educational level is higher than the educational level of the whole of Greece. Also, according to the company that collected the data, more educated people tend to participate easier in telephone surveys than the rest of the population. This factor introduces a small bias in the results which should be taken into account in the interpretation of outcomes. The overrepresentation of employed women in the sample compared to employed women in Greece could be partly explained by the higher percentage of employed women in Attica compared to the rest of Greece. It is however explained by the decision to include almost as many women in the sample as men in order to have an adequate number of respondents for disaggregating the data by gender.

The resulting gender composition in the sample is 51.4% men and 48.4% women. Moreover, 82% of the respondents are 25-54 years old, 80% are high school graduates and 62.8% are married. Thirty six percent of them do not have children while 34.4% have two children. The great majority of respondents (78.2%) stated that their economic situation is ranging from average to good.

The economic sectors in which there is the highest concentration of technical employees are the following:

– Other social services: 11.6%
– Banking and related businesses: 10.1%
– Trade: 9.1%
– Education: 8.8%
– Health and social protection: 8.4%
– Construction: 7.8%
– Public administration and defence: 6.4%

According to the survey the great majority of technical employees (73.2%) are working in the private sector while the remaining 26.6% are working in the public sector. As far as the specific occupations we notice the following:

– Clerks: 22.8%
– Scientists: 18.3%
– Specialised technicians: 14.9%
– Directors: 12.4%
– Service employees and salespeople: 12.2%

The variety of sectors and occupations represented in the sample is another indication of the ambiguity of the term "technical".

One of the questions asked was about the way employed people learn to practice their profession, either by studies or by practice or by a combination of both. The combination of studies and practice is the answer for the 36.1% of technical employees. Learning to prac-

tice the job by work experience alone was stated by 35.3% of them while learning it by studying alone was mentioned by 28.6% of employees. At a more disaggregate level it is possible to draw some conclusions about the correlation of this variable and personal and organisational characteristics[12] of respondents.

Those working in their current profession for more than 20 years composed 28% of the sample while two other categories, practising the profession for 6-10 and 11-15 years, were the 19.1% and 17.4% of the sample respectively. Those respondents working in their current occupation and company for more than 20 years are 19.4%, while 18.2% and 16.1% of the respondents are practising the same occupation in the same company for 6-10 years and 3-5 years respectively. These results are expected since tenure is high in the Greek labour market compared to other European countries.

It is also worth noticing that technical employees are working either at very large – for Greek standards – companies (30.1%) that is at companies with more than 100 people or at very small companies (1-3 employees) (21.8%) or small companies that is companies with 4-9 employees (14%).

A little more than half of the technical employees (53.4%) have not participated in a training program related to their profession. From those that have participated in such programs, 41.8% did so in the company they are currently working. In most of the cases, participation in the program was initiated by the supervisor or owner of the company and not the employee himself/herself. The percentage of training participation seems high but it should be noted that it refers to the whole working life of respondents and not to a recent point in time. It is also expected that since more educated people tend to participate easier in telephone surveys, the same people tend also to participate more in training than the remaining population. Therefore, this percentage should be considered as an upward limit to training participation of technical employees, all employees and of technical employees outside the Attica area since it is expected than non-technical employees participate less in training and also people outside the Attica area participate less as well. The other point worth underlining is that training is usually initiated by the employer which suggests the importance of the work environment for the extent of training participation of employees.

Most respondents claim that the main reason for participating in training programs is to acquire occupational knowledge. Most training participants find this knowledge quite to very useful. Seventy eight percent of them rated it 7-10 (in a ten point scale). A majority of the respondents (66.3%) wishes to participate in further training programs related to their profession while 41.1% wishes to participate even in training programs not related to their profession. The main reason for any future participation is acquiring professional knowledge (65.2%). The main obstacles to further training participation are lack of time (60.3%) and lack of financial resources (19.7%). The results clearly show the very positive opinion of technical employees about past and further training. The fact that lack of time is the main obstacle for further participation is understood since Greeks work more working

[12] Characteristics of the organizations in which they are employed.

hours than most Europeans[13].

### 2.5.3 Public versus private sector

A comparison between responses of technical employees who work in the public sector and technical employees who work in the private sector reveals some interesting findings. Technical employees in the public sector are mostly working in public administration and defence (21.7%), in education (21.7%), in health and social services (15.5%) and in the banking sector (9.3%). Technical employees in the private sector are mostly working in other social services (13.6%), in commerce (12.2%), in the banking sector (10.4%) and in construction (9.5%).

The most frequent occupations of technical employees of the public sector are scientists (33.5%), clerks (27.3%) and technical assistants in scientific occupations (11.8%). In the private sector, the occupations with most respondents are: clerks (21.2%), specialised technicians (18.1%), service/sales occupations (15.6%), directors (13.8%) and scientists (12.9%).

The majority of public employees learned their profession from studies (47.2%) and the combination of studies and work experience (32.3%). On the other hand, the private employees learned to practice their profession more often by experience (40.5%), and less often by combination of experience and studies (37.6%) and even less often by studying alone (21.9%). These differences indicate that there are differences in the hiring criteria in the public and private sector. In the public sector, educational credentials seem to have more importance while experience in practising an occupation is more important in the private sector.

A considerable majority of technical employees in the public sector (54.7%) and a significant number of technical employees in the private sector (21%) are working in very large companies (with more than 100 employees) while 45% in the private sector are working in companies with 1-9 employees.

The majority of employees in the public sector (67.1%) have attended a training program whereas the majority in the private sector does not have the same experience (60.7%). In the public the initiative for the participation in the training program was mostly of the company (61.1%) while in the private sector the initiative was in 52% of the cases of the company and in 48% of the cases of the employees themselves. These results show the difference in the working environments of the public and the private sector. In the public sector, there is more time and higher availability of resources for training whereas in the private sector these resources are more limited. The higher availability of resources for training in the public sector is also indicated by the higher percentage of supervisors initiating the training in the public sector compared to the private sector.

The knowledge acquired from the training program is judged as quite to very useful by the 87% of both public and private employees. Over 70% of all employees evaluate the pro-

[13] According to the labour force survey data, only in the UK working hours are higher than Greece in the EU.

grams at 7-10 in a ten point scale. Eighty one percent of public employees wish to participate in other training programs in the future. In the private sector 61% of technical employees wish to participate in further training. It is interesting that even thought technical employees from both sectors evaluate equally positively past training, public employees wish to participate in further training at a much higher percentage than private employees. The higher rate of public employees could be possibly explained by the greater time availability of time they have compared to private employees.

The main motivating factors for all employees for future training participation is first acquiring occupational knowledge and second for public employees personal interest and for private employees better prospects in the labour market. These findings are quite justified if we take into account the less secure conditions private employees are facing compared to public employees. For all respondents, the stronger obstacles for training participation are lack of time (60%) and lack of financial resources (20%).

Finally it is worth noting that private employees are not willing to participate in training programs that are not related to their profession (58.4%). Public employees are more willing to do so (49.1%=yes 47.2%=no). This finding is connected to the reasons for which each group wishes to participate in training programs and the availability of time for each group.

### 2.5.4 How do employees learn to practice their profession

Employees of the banking sector learn their profession mostly by the combination of studying and experience (14.2%) and secondly by special studies (9.8%). With special studies learn to practice their profession 23.7% of employees in the educational sector, 16.2% in the health sector and 9.2% of employees in public administration and defence. Learning by experience is more common in commerce (16.5%), in construction (12.7%) and in other services (11.3%).

As far as different occupations are concerned, those having professional occupations learned their profession by special studies at a rate of 42.8% and much higher than all other categories. By experience learned their occupation those working in service jobs, salespeople (23%), specialised technicians (22.1%) and clerks (21.6%). By combining studying and experience, they learned to practice their occupation 29.4% of clerk employees, 22% of directors and 15.1% of those having scientific occupations.

The majority of those who learned their profession by studying, have attended a training program (55.8%), and this happened mostly by their own initiative (57.3%). Those that learned their profession by experience have attended training programs mostly after the initiative of their company (70.6%). Respondents who learned their profession by a combination of studying and experience have attended training programs mostly after the initiative of their company (57.3%). The majority of those who have learned their profession by studying and experience have participated in training programs (54.1%) while the majority of those who learned by experience have not participated in training programs (68.1%).

According to the above results, those employees that rely more on education and perhaps have more years of schooling, tend to participate more often in training and more often

they initiate the training themselves while those who learned to practice their occupation by experience, are less willing to participate in training programs and less often initiate their training participation.

All employees stated that the most important reason for having participated in the past and for participating in the future in training programs is acquiring professional knowledge. Moreover, the great majority from all types of employees (with respect to the way they learned to practice their occupation) evaluates the knowledge acquired at these programs as quite to very useful.

Finally, the majority from all three categories of employees stated that the biggest obstacle for future participation is lack of time. They also seem equally unwilling to participate in training programs not related to their profession.

### 2.5.5 Size of company

We use the following coding of companies with respect to company size in terms of employees:

- Companies with 1-9 employees = small companies
- Companies with 10-35 employees = medium companies
- Companies with 36-100 employees = large companies
- Companies with more than 100 employees = very large companies

The employees that are working in:

- small companies are more often employed in other social services (19.4%), trade (16.7%) and construction (11.6%).
- medium companies are more often employed in education (27%), banking (15.3%) and shipping (7.2%).
- large companies are more often employed in banking (13.9%), health (12.5%), trade (9.7%), informatics (6.9%), education (6.9%) and public administration and defence (6.9%).
- very large companies are more often employed in banking (13.9%), health (13.7%), public administration and defence (13.7%) and other services (10%).

As far as occupations are concerned:

- In small companies there are more specialised technicians (21.8%), service employees (19%), scientists (16.7%) and clerks (13.4%).
- In medium companies there are more scientists (30.6%), clerks (18.9%), specialised technicians (15.3%) and directors (12.6%).
- In large companies there are more clerks (37%), directors (20.5%), service employees (16.4%) and scientists (11%).
- In very large companies there are more clerks (32%), scientists (15.4%), directors (14.3%) and technical assistants for scientific jobs (12.6%).

In small companies, 45% of workers learned their profession by experience, 33.8% learned it by combining studying and experience and 33.8% learned it with special studies. At medium companies 41.4% of the workers learned their profession by special studies, 32.4%

learned it by combining studying and experience and 26% learned it only by experience. In large and very large companies the combination of studying and experience is the most often choice (39% and 41.2% respectively). In large companies the second choice is experience (36.1%) while in the very large companies special studies are the second choice (30.2%). These results show that experience alone is more often the way technical employees learn to practice their profession in small companies compared to larger companies. In larger companies the importance of combining education and experience is outlined.

Concerning job tenure, there are no significant differences between the employees working in companies of different sizes. As far as tenure in the same job and the same company, we have the following results:

In small businesses, the relative majority (24.8%) has been working there for more than 20 years, 18.2% have been working there for 6-10 years and 14% have been working there for 3-5 years.

- In medium size businesses, the relative majority of workers have been there for 6-10 years (20.7%), while 17.1% have been there for more than 20 years and 16.2% have been there for 3-5 years.
- In large businesses the relative majority has been working there 1-2 years (20%), 17.8% has been working there 6-10 years and 16.4% has been working there 3-5 years.
- In very large companies the relative majority has been working there 3-5 years (20.3%), 19.2% has been working for 6-10 years and 17% more than 20 years.

These results show that there is an inverse relationship between tenure in the same job and the same company and the size of the company. This trend probably reflects the situation in the private sector since in the public sector there is no reason for any differences with respect to the size of the company.

The majority of employees in small, medium and large companies (69%, 51.4% and 50.7% respectively) have not participated in a training program related to their job. On the contrary, 65.3% of workers in very large companies have participated in such programs. Moreover employees in very large companies show the highest wish to participate in future training programs (77.5%) followed by employees in medium companies (69.4%) and employees in large companies (64.4%). In small companies 58.3% of all employees wish to participate in future training programs. The higher availability of training resources in large companies is underlined by the results. Moreover, the higher wish to participate in further training in larger companies can be explained by the existence of a culture of training and the higher percentage of educated employees in larger companies.

The factors motivating employees of all company sizes are the same, namely the following: first, acquiring professional knowledge, second, better labour market prospects and third improvement of the financial situation. The main differences are the following: the motivation «acquiring professional knowledge» is stronger in bigger companies while «better labour market prospects» and «improving of the financial situation» are stronger motivations for employees of smaller size companies.

Lack of time is the most common obstacle for participating in future training programs for all employees and it is stronger for employees of medium sized companies (71.2%), small

companies (60.2%) and very large companies (59.3%). Lack of financial resources is the second most often mentioned obstacle by all employees. This second obstacle is stronger the smaller the size of the company.

### 2.5.6 Who initiates the training

The initiative for participating in training programs had more often than the others respondents, those working in health and education (17.6% in both cases), other services (13.6%), banking (12.8%), and public administration and defence (7.2%). In these sectors there is a higher percentage of highly educated people compared to the remaining sectors.

As far as occupations are concerned, those who participated in training with their own initiative more often than others are those holding scientific jobs (35.2%), clerks (18.4%), directors (16%), specialised technicians (12%) and technical assistants to scientific occupations (10.4%). The workers that participated in training that was initiated by the employer were mostly clerks (31.4%), scientists (17.9%), directors (12.8%), technological assistants to scientific occupations (11.5%) and service workers (11.5%).

The relative majority of those who participated in training with their own initiative learned their occupation by studying (44%) and by the combination of studying and experience (40%). In this case, the importance of personal characteristics and more specifically the importance of the educational level of respondents is shown as a factor facilitating training participation since respondents who learned their occupation by studying are usually the respondents with the highest educational credentials.

### 2.5.7 Wish to participate in future training programs

Those who wish to participate in training programs whether it is related to their job or not are more often from the banking sector, education, other social services and health. Compared to other technical employees, those working in construction and trade are less motivated to participate in training programs.

As far as occupations are concerned, clerks, scientists, directors and specialised technicians are those employees that compared to the whole sample have a stronger wish to participate in training programs related to their profession. The basic characteristics of the technical workers that wish to participate in future programs are the following:

- They have learned their profession by combining education and experience and by special studies. On the other hand the great majority of those that do not wish to participate in training have learned their profession by experience. Respondents who rely more on education than experience to practice their job are usually those who have higher educational credentials and they also have a more positive attitude towards training compared to the other respondents.
- They often practice their occupation 6-15 years and a significant number of them for more than 20 years.
- They have participated in the past, especially in the last 5 years in a training program in the same company while some have participated in training programs while with previous employers.
- Those working in the public sector, having the previous experience of participation in

training programs, state a stronger wish to participate in training in the future compared to employees of the private sector irrespectively of the program being related or not to their job.

Acquiring professional knowledge seems to be the highest motivating factor for attending training programs while the second motivating factor is getting better prospects in the labour market. The major obstacles are lack of time and lack of financial resources. The second one is especially important for poorer employees. We should also note that those that say that their economic situation is average to bad consider as a second most important motivating factor the improvement of their financial situation.

Women more often than men wish to participate in training programs. This outcome is verified by official statistics as well[14]. It seems that women because are hit harder by unemployment, they are trying to acquire as many credentials as possible as a way to improve their chances for finding employment and for improving their employment conditions.

The younger the worker the more often s/he wishes to participate in further training programs. This is reasonable since younger employees are more often at the beginning of their career; therefore they wish to improve their employment prospects than older employees who are already more advanced in their career. Moreover younger respondents are generally more educated than older ones and therefore they have more positive attitudes towards training.

### 2.5.8 Demographic characteristics

Men are overrepresented in the occupations of specialised technicians and directors (24.4% and 15.4% respectively) and women in clerks and those holding scientific jobs (35.8% and 24.6% respectively).

Directors are mostly middle aged or older, those holding scientific occupations are usually middle aged, technological assistants to scientific occupations are usually of younger ages and so are the clerks. There are very few clerks in the sample over 55 years old. If we consider that the condition for participating in the sample was personal consideration that the job requires technical knowledge, this finding is easily understood.

Male respondents more often than women have learned their job by experience and less often by a combination of experience and studying or by studying alone. Moreover men are more negative about their economic situation than women. Women have participated in training programs more often than men. With respect to age, technical employees 35-44 years old have participated in training programs more often than the others, followed by technical employees 18-34 years old. In all age groups, except those above 55, the initiative for participation in training was their businesses'.

Besides acquiring professional knowledge which was the most common motivating factor for participation in training and was stated by all age-groups, the respondents who were 18-34 years old participated more often than the others in order to improve their prospects in

[14] See for example chapter two in this report.

the labour market while the older respondents, being at a higher stage in their career than the younger respondents, claimed that their personal interests played a higher role. The respondents above 55 years old more often than the younger respondents claimed that improving their financial situation was an important motivating factor for participating in training. Women state their personal interests as the second most important factor while for men better labour market prospects is the most common second factor.

As far as the wish to participate in future programs, whether it is related to the profession or not, the great majority of women respond positively (75%). The same response is stated less often by men (58% of men wish to participate in further training). The wish to participate in future training is more common among young people and those that claim that their financial situation is average to good.

### 2.5.9 Conclusions

In the previous sections we presented the analytical results of the survey we designed to examine the extent and the factors influencing training participation of technical employees. In this section we summarise the main outcomes and draw some final conclusions about these outcomes.

The first point we would like to underline is the ambiguity of the term "technical" not only in people's minds but also in official occupational classifications. One of the initial questions asked to perspective respondents of the survey in order to determine whether or not to include them in the survey was whether they were a technical occupation. Most people were puzzled by the question and were not able to answer it with confidence. We then preceded giving additional information, asking people whether their profession required technical knowledge. This clarification helped most respondents identify either with technical or non-technical workers. But even in official classifications namely the ISCO-88 occupational classification that is used by most international labour market organisations it is not easy to separate all occupations into those that are technical and those that are not.

According to our survey, technical employees are mostly concentrated in service sectors and construction. Moreover a great majority of them work in private businesses. It is also worth noticing that they tend to work in very large companies for Greek standards (with more than 100 employees) or small companies (with 10 or less employees). The occupations with higher percentages of technical employees are: clerks, scientists, technicians and service/sales employees. The question about how they learned to practice their profession divided respondents into three almost equal parts: those who learned it by studies alone, those who learned it by experience alone and those who learned it by a combination of both.

It is very interesting to note that almost half of the respondents have participated in a training program during their working life. This is probably an upper limit to training participation for employees and even technical employees in Attica. Of course we should take into account that informal forms of training are most likely not considered in answering this question.

Another important aspect of training participation is that in most cases training was initi-

ated by the supervisor or the owner of the company and not by the employee himself/herself. Employers encourage training participation of their employees at different rates which correspond to the different business characteristics. Therefore, the organisational factors or the environment in which a technical employee is working is a crucial factor affecting his/her chances of participation in training.

The main reason for participating in a training program was for most respondents to acquire occupational knowledge. Most of the participants in training found this knowledge to be quite to very useful. Almost 80% of them rated the training programs they have attended from 7-10 (in a ten point scale). This finding suggests that the quality of the training programs for employed people is quite good or that it is perceived as quite good by participants.

Connected to this positive evaluation is the wish of the majority of respondents (66%) to participate in future training programs related to their profession while 41% of them also wish to participate even in training not related to their profession. The main reason for their future participation is acquiring professional knowledge (65.2%). The main reasons that they state as obstacles to their future training participation are lack of time (60.3%) and lack of financial resources (19.7%).

The comparison of responses from employees of the private and the public sector shows that experience is as expected more important in the private sector while employees of the public sector rely more often on their studies for practicing their job. The participation rates in the public sector are higher than in the private sector possibly due to the higher availability of funds and time for training in the public sector whereas market competition in the private sector imposes training participation.

Moreover, in the public sector the initiative for the participation in the training program was mostly of the company (61.1%) while in the private sector the initiative was almost equally divided between the company and the employees themselves. This finding also indicates the higher availability of training resources in the public sector compared to the private sector.

Both public and private employees evaluate training programs positively and the majority from both groups wish to participate in further training. The main motivating factor for all employees for participating in further training is acquiring occupational knowledge. The second most important motivating factor for public employees is personal interest while for private employees it is improving their labour market prospects. These findings are quite justified if we take into account the less secure conditions private employees are facing compared to public employees. For all respondents, the basic obstacles for participating in training are lack of time (60%) and lack of financial resources (20%).

The majority of private employees are not willing to participate in training programs that are not related to their profession (58.4%). However, public employees are more willing to do so (49.1%=yes 47.2%=no). This finding is connected to the reasons for which each group wishes to participate in training programs.

A comparison of the responses according to the way people claim they have learned to practice their profession shows that respondents that rely more on education which are

possibly those who have more years of schooling tend to participate more often in training. On the other hand, those who have learned to practice their occupation mostly by experience have participated less in training and are also less willing to participate in further training.

It is also worth noticing the differences in the responses of technical employees according to the size of the business in which they are employed. The first important outcome is that technical employees in small businesses rely more on experience and less on education and training when practising their job. In larger companies, the combination of studying and experience is a more common outcome.

Moreover, the majority of employees in small, medium and large companies (69%, 51.4% and 50.7% respectively) have not participated in a training program related to their job. On the contrary, 65.3% of workers in very large companies have participated in such programs. Moreover, the wish to participate in future training programs is positively related to the size of the company.

We then compared responses of technical employees who initiated the training themselves and those who participated in training because their employer suggested it.

We found out that those with higher education and those holding scientific jobs more often than others initiate training themselves compared to the other respondents.

The comparison of results according to whether respondents wish or not to participate in future training showed the following outcomes. Those who wish to participate in training programs (related or not related to their job) are more often from the banking sector, the educational sector, other services and the health sector. Compared to other workers, those working in construction, trade and other services are less motivated to participate in training programs. More educated respondents, those who have recently participated in training, women and younger technical employees stated a stronger wish to participate in further training programs.

Finally the analysis of the demographic characteristics of respondents shows that men more often than women have learned their job by experience and less often by a combination of experience and studying or by studying alone. Moreover men are more negative about their economic situation than women. On the other hand, women have participated in training programs more often than men. With respect to age, respondents 35-44 years old have participated in training programs more often than the others, followed by respondents 18-34 years old. In all age groups, except those above 55, the initiative for participation in training was their businesses'.

Besides acquiring professional knowledge which was the most common motivation for participation in training and was stated by all age-groups, the respondents who were 18-34 years old participated more often than the others in order to improve their prospects in the labour market while the older respondents, being at a higher stage in their career than the younger respondents, claimed that their personal interests played a higher role. The respondents above 55 years old more often than the younger respondents claimed that improving their financial situation was an important motivating factor for participating in further training. Women stated their personal interests as the second most important factor

while for men better labour market prospects is the most common second factor.

Overall, the analysis of the survey data showed the importance of both personal and organisational aspects as factors influencing training participation of technical employees. The most important personal factors are gender, age and education. Women, younger and more educated technical employees are participating at higher rates in training and show stronger interest in participating in further training. On the other hand, the most important organisational characteristics affecting training participation are the size of the business and whether it belongs to the private or the public sector. Technical employees in larger businesses and in the public sector have more chances to participate in training than the other employees.

## 2.6 Final Conclusions

In this chapter we draw some conclusions from the analyses presented in the previous chapters and present some initial recommendations about improving training practices in Greece.

The analysis of official statistics shows that while participation in education is very high for the Greek population and especially young people, training participation remains relatively low. People who are unemployed or with precarious employment characteristics or those who are strongly hit by labour market problems – women and the young - show higher participation rates than the remaining population. These results show that people use training to improve their chances in the labour market and therefore they recognize its value in helping them advance in their career. Moreover, these trends are affected by the importance that European Employment Strategy is putting on the benefits of training on one hand in the employability of the labour force and on the other hand on the competitiveness of businesses. Official statistics show the effect of certain demographic characteristics on the extent of training participation but also they shows the effect of organizational characteristics on training participation of employees. It therefore outlines these two important factors on training participation. According to these results, women, young people and more educated people have higher chances to participate in training. Moreover, employees in large companies and employees of the public sector participate more often in training. It is also shown that part-time employees and temporary employees participate in training at higher rates than the other employees.

In chapter three we presented the analysis of survey data from a sample with an overall high training participation. These data are more useful for extracting recommendations for improving training practices than for generalizing the influence of factors facilitating training participation. One conclusion we can draw from these data is that employees who participate in training tend to value the training for their occupational and personal development. Their comments about improvement of training practices touch on all aspects of training: organisation of programs, focus and content, connection with real needs, evaluation and motivation factors which will enable more employees to take advantage of training.

In the same chapter we also presented a survey of employers of small businesses (up to 20 employees) examining the extent of their interest in their employees participating in subsi-

dized training programs. The picture we got from this survey is quite negative indicating the obstacles that employees in these small companies are facing with respect to training participation. This survey shows that existing practices for these small companies are not appropriate or effective in motivating the participation of employees in training.

Finally the results of the survey of technical employees about their training participation verifies the importance of the two broad factors – personal and organisational – in the participation rates of employees. In this analysis we clearly see the importance of organisational factors by the fact that most of training of employees is initiated by employers but at the same time it is initiated at very different rates in different organisational environments.

The analyses presented in this report allows us to make some initial recommendations about improving training practices of employees – and especially technical employees – in Greece. These recommendations include the following:

– The factors determining training participation of employees, namely personal and
– organisational factors, should be clearly outlined in order to produce focused interventions on specific groups.
– The participation of employees in small companies should be further examined
– because it is faced with severe obstacles.
– Access to information about available programs is needed for both employers and employees.
– The combination of theoretical aspects with practical information in training programs is outlined by many respondents.
– Accreditation of training is expected to improve its quality and in the long-run became a factor that facilitates participation for greater audiences.
– Training should focus on specific occupational knowledge and at the same time
– provide horizontal skills and competencies.
– Job profiles are necessary in order to improve the quality of training programs for the employed.

# 3 Italy

*Massimo Tomassini*

## 3.1 Foreword

In this chapter two lines of research results are presented concerning activities carried out about the chosen sectors (software production, radio and TV). Following an executive summary (3.2), sections 3.3 and 3.4 include data and information elaborated from available literature and statistical sources and on the basis of field interviews with owners/managers of several ICT and Radio and Television companies. Then section 3.5 gives the results from surveys in both sectors. Other relevant research outcomes have been collected through a number of interviews based on the life histories methodology. Such outcomes will run into a larger report on life histories that will be presented in a subsequent report. However, some important clues related to such outcomes are presented in the following executive summary.

This chapter has been prepared by Massimo Tomassini, who is co-ordinator of the Italian project, with collaboration from: Michela Bastianelli and Fabio Roma (background analyses), EUROINNOVANET (questionnaire-based inquiries), Giandomenico Celata and Guido Viale (field qualitative interviews), Giuseppe Caporaso (life-hystories).

Respondents to qualitative field inquiries included:

*managers* in SW companies

- Giancarlo De Leonardis, HR area director, Datamat spa
- Stefano Grego, Multimedia area director, A.c.s.s. spa
- Paolo Furci, HR manager, Bnl Multiservizi
- Olimpia Imperiali di Francavilla, HR area director, Engineering Ingegneria e Inormatica spa
- Mauro Marchese, Personnel, Organization, Quality and Systems area director, Informatica e Telecomunicazioni spa
- Roberto Mastalli, HR area director, Auselda Aed Group spa
- Francesco Mastidoro, president, Eulogos managers in R&TV companies
- Cynthia D'Ulzia, director general, Radio Città Aperta
- Massimiliano Maffei, HR area director, Radio Dimensione Suono
- Marco Moretti, co-ordination and press systems manager, Radio Città Futura
- Massimo Topai, director general, Trade Mark Service srl

## 3.2 Executive Summary

This chapter deals with the outcomes of research activities concerning the background analyses, questionnaire-based inquiries, and life histories carried out in the Participa project. The results give a first set of indications regarding the evolutionary lines of professional technicians' competencies in the two sectors as well as the most relevant dynamics concerning their own learning and training realities and needs. Analyses so far carried out show that software (SW) production and radio and television (R&TV) in the Rome area are highly

dynamic sectors in which important phenomena concerning technicians in both sectors are taking place. Competencies, learning patterns and training needs of such professional strata are significantly reshaped by different intervening factors. In particular, the evolutionary paths of professional in these activity sectors appear to be influenced by changes in firms' strategies and structures generated by three driving forces: market dynamics, technological innovation and new institutional conditions.

Market dynamics have recently brought about continual reshaping of both sectors, each one according to specific trajectories. In the SW sector relevant firms' restructuring and downsizing occurred during the last Nineties and the first years of the current decade, involving both large companies and SMEs, as a consequence of two main crisis factors. The first crisis factor related to a local market crisis due to different attitudes and spending capacities of public administrations, traditionally main sources of contracts for the sector as a whole in the Rome area. The second crisis factor can be attributed to the more global crisis generated by the traumatic end of the "new economy" first phase. A substantial selection of actors and activities has taken place in the SW sector: restrictions in demand and price falls allowed only the most innovative and best positioned firms to survive and, within such firms, the activity areas more capable in terms of innovation and effective performance. Also some "district" characteristics of the sector – in which different supply chains and forms of co-operation among firms are in place – helped the survival of firms in several cases.

The R&TV sector has also been reshaped by recent transformation waves, due to internal competition and to the consolidation of new equilibria within the interstitial areas of a market dominated by two large oligopolies. These are the public RAI and the private Mediaset, both holding as a whole a share that is close to 90% of their respective markets. The interstitial areas (which represent the field of this specific section of the Participa project) are actually occupied by lively small companies, in search of a clearer role also in relation to the new phase of development which is going to start after the very recent – December 2003 – reform law regulating the entire media system (newspapers, televisions, radios).

The second driving force influencing the evolution of professionals in the two sectors is technology. In the SW sector, the advent of the Internet and the generalised diffusion of new Internet-based technological platforms, standards and products brought about substantial reshaping of several professional activities. Continuously up-dated technological knowledge is more and more needed in order to stay in touch with such radical transformations. At the same time new know-how must be accumulated within companies in relation to new client-service needs linked with new technological arrangements. In the R&TV sector, work activities and firm structures have been deeply transformed by the combined use of Internet facilities and of new digital technologies applied to voice- and video-recording. The latter has brought about significant phenomena of job enlargement for professional jobs and reciprocal re-adjustment between professional and operational areas.

The third driving force has an institutional nature. Besides the already mentioned reform which will have several effects of the R&TV sector, important organisational and professional dynamics have been induced in both sectors by new regulations issued by recent laws on work contracts aimed at introducing more flexible mixes of long-term and temporary

employment. After periods in which hyper-regulation and de-regulation went on in parallel, a need for new forms of flexibility can now be observed in small and medium-sized companies. New contractual equilibria are necessary in order to keep a balance between the search for mobility and lower labour costs on one side and the need for firm know-how preservation on the other (especially in situations where the skill shortage of qualified personnel is an open problem).

Due to the above driving forces, in both sectors important phenomena are taking place concerning:

– the increased quality of work processes transformations, side by side with emerging innovation patterns;
– the restructuring of hierarchical and communicative patterns, which reinforce the importance of informal organisation;
– the rise of new functions and roles (such as, for instance, the technically enlarged
– role of many radio and TV journalists).

As a whole new ways and working and participating in organisational processes seem to emerge, although with different connotations inside the two sectors, allowing new spaces for more qualified and empowered strata of professionals-technicians. In SW, the above tendencies are leading towards the reinforcement of professional strata which hold solid technical knowledge and competencies. In R&TV, where the technological infrastructure has a support function and where core activities are mostly of a communicative and creative nature, the emerging trends favour those who are able to adapt and develop within new technological patterns (which represent opportunities to gain new professional competitive advantages). Overall, after the recent transformation waves generated by the combined effects of market, technology and labour regulations, in both sectors job-keeping and professional development seem increasingly more dependent on personal and collective abilities for continuous learning and self-valorising innovative competencies.

Inter-firm mobility is still high, both in the upward direction (with connected professional gains) and in the downward direction (often accompanied with risks of job loss). However, a general trend towards stabilisation seems to characterise the professionals' strata in both sectors. After recent transformations SMEs in SW and R&TV are still largely populated by people (very often young people) holding part-time or other kinds of temporary contracts. However, at the same time new strata of professionals are emerging willing to stabilise their positions and able to develop new relationships with the company based on a mix of professional reliability, trust, loyalty and solidarity. Even specific abilities of acting as "internal consultants" have been observed: members of technical staff are in some cases able to provide visions and specific advice on processes and products to firm management which prove to be very useful for the survival and development choices of the firm.

In parallel new behaviours seem to emerge within firms' management. In cases observed through the life-stories method, the well-known "short-termism" of innovative and small-sized businesses – ready to start and close activities as soon as profit opportunities rise or disappear, and ready to hire and fire as well, according to contingent profit expectations – seem to be tempered by forms of behaviour closer to those depicted by neo-institutional

authors in economics. These economists emphasise whereby firm stability is highly valued and know-how embedded in personnel is considered as the fundamental asset to be maintained over time also in periods of crisis.

What are the consequences of the above trends on continuous vocational education and training is a key question. Evidence collected in SMEs in SW and R&TV show how deep is the divide between continuous learning needed in fast changing productive processes on the one side and most of education and training interventions nowadays available from public institutions on the other side. A large majority of interviewees within the questionnaire-based inquiry and the life stories collection, as well as managers/entrepreneurs interviewed within the background analysis, stated that really important professional competencies can be acquired through experience. Only real organisational settings – according to the interviewees – can provide the conditions for learning in swiftly evolving environments. It seems clear that in such complex environments, formal/codified knowledge must be continuously updated but at the same time accumulation of tacit knowledge is key for being really able to participate in work activities.

In parallel basic education is very often considered as insufficient and most of the experiences in vocational education are deemed to provide only a very superficial preparation in relation to real working needs. At the same time great interest is manifested for individual forms of professional growth through specialised press and several other kinds of updating chances, including those available through the web (the latter more in the SW than in the R&TV sector). Competence development is the real measure which is generally used in order to assess what is valuable and what is not in this field, and competence development is largely related to both explicit and tacit knowledge. People seem generally aware that, in contexts which are continuously reshaped by technological (i.e., by definition, formal) drives, formal knowledge without experience is – so to speak – empty but also experience without appropriate levels of formalisation is blind.

New spaces for evolutionary forms of training seem therefore open, but probably implying new approaches on the training supply side, substantially different from the current ones. In this regard the episode told within one of the life stories is in many ways emblematic. The protagonist – a young man who tried several times to get a stable job in the radio sector – finds an advertisement concerning a course on a very specific new technology. Then he spends all his savings to pay the fee of such a course, attends it and from then on receives several offers which allow him eventually to make the right choice for his professional future and to get very fast and satisfactory returns on his investment.

What seems important in this story is not the availability of short and effective training activities as such. Rather it is the interplay between personal experience – through which the young man is able to understand a specific knowledge/competence need in his working environment – and formal training activities, which can be found on the market and can satisfy such specific needs, that is key. In other words new forms of continuous interaction between the two kinds of knowledge – tacit and codified – seem needed. This interaction should entail, from a policy perspective, new forms of reciprocal recognition between the training world and the productive world, and should also imply more generalised lifelong learning attitudes from people in these types of working environment.

## 3.3 Background Analyses: Software Production

Data and information elaborated from available literature and statistical sources are reported in the first two parts of this section: "The Software and ICT Services Sector in Italy" and "The Software and ICT Services Sector in the Rome area". The main outcomes of field interviews with owners/managers of different SMEs (integrated with responses also from large companies) are provided in the third part "HRD, Organisation and Learning Processes".

### 3.3.1 The Software and ICT Services Sector in Italy

Firms dealing with software and ICT services belong to a wider sector which in official statistics is defined as "Informatics and related activities". The most recent structural data (from 2001) show that the wider sector comprises more than 84,000 enterprises. Software and ICT services firms represent about 42.1 % of the ensemble (totalling about 35,657 enterprises), while EDP represent 32.6 % and the remaining (25.3 %) is composed by firms operating in hardware installation and maintenance (ISTAT - "Archivio Statistiche Imprese Attive (Asia)" service, 2003).

In order to understand the qualitative dynamics that this report is dealing with, some main figures have to be mentioned. First of all, SMEs represent the overwhelming majority of firms' population. At the national level the concentration of firms in lower classes both of employment and turnover is respectively 96.15 % and 88.82 %. The distribution of the other values is absolutely coherent with the development model of the country, in which large firms are concentrated in the North West and (considering the service economy) in Central Italy.

| | North-West | North- East | Central Italy | South and Islands | Total | % |
|---|---|---|---|---|---|---|
| Less than 15 | 14,235 | 6,997 | 8,062 | 4,984 | 34,278 | 96.15 |
| 15-50 | 450 | 197 | 208 | 133 | 988 | 2.77 |
| 50-100 | 85 | 33 | 50 | 29 | 197 | 0.55 |
| 100-500 | 83 | 24 | 37 | 18 | 162 | 0.45 |
| More than 500 | 16 | 2 | 13 | 1 | 32 | 0.08 |
| Total | 14,869 | 7,253 | 8,370 | 5,165 | 35,657 | 100.00 |

*Tab. 1 Distribution of firms (software and services) by employment- size classes*
*Source: ISTAT – "ASIA" service, 2003*

Other interesting data regards the market in which the software houses operate. 62% of the software-houses sell their products and services to Industry, which represents the largest market share; a consistent portion of the demand derives from Services, especially from Distribution (30.2% of total Services), Banking (29.5%) and Public Services (27.3%) (IDC Italia, 1999). Another aspect to be taken into account in order to understand the sector dynamics is the location of the reference markets. If it is true that the IT market is still one of the best examples of the global market, it is equally true that the Italian software houses are not included in this scenario. They operate almost exclusively within national borders and in relation to local/regional demand: 68.1% of the sales derives from local demand in

the Northwest; 65.0% in the North-East, 76.4% in Central Italy; 76.2% in the South and Islands (IDC Italia, 1999).

As far as market trends are concerned, in 2002 the software and services sector became the leading sector in the larger IT market. While the latter as a whole recorded a fall of 2.2% in the same year, the software and services sector grew by 3.3% nearing a turnover of € M 13,700 (Assinform, 2003). The crisis experienced by the sector in the mid-1990s can thus be considered as overcome. A new expansive cycle seems to have started although growth rates are unlikely to become as high as they were at the beginning of the computer revolution in the Eighties and during the short season of the New Economy at the end of the Nineties.

| Classes of turn-over | North-West | North- East | Central Italy | South and Islands | Total | % |
|---|---|---|---|---|---|---|
| Less than € 500,000 | 13,014 | 6,455 | 7,502 | 4,701 | 31,672 | 88.82 |
| € 500,000 - 5 M | 1,581 | 717 | 747 | 427 | 3,472 | 9.73 |
| € 5 M - 50 M | 241 | 73 | 100 | 36 | 450 | 1.26 |
| € 50 M - 250 M | 29 | 6 | 16 | 0 | 51 | 0.14 |
| More than € 250 M | 4 | 2 | 5 | 1 | 12 | 0.05 |
| Total | 14,869 | 7,253 | 8,370 | 5,165 | 35,657 | 100.00 |

*Tab. 2 Distribution of firms (software and services) by turnover- size classes*
*Source: ISTAT – "ASIA" service, 2003*

With regard to the characteristics of the employees, "66.9% of employees are male, in particular we have on average 99 men and 49 women for each enterprise" (IDC Italia, 1999). For the age composition "we can see how the central age groups between 26 and 40, includes 71.5% of employed men and 77.9% of employed women, while the extreme age groups are much less numerous (only 0.2% of the males are under 20 and 0.3% of the females, 5.3% of the males are over 50 and only 1.6% of the women" (IDC Italia, 1999). The educational attainment of the employees is a further point to discuss. In the software sector, over 65% of employees have an upper secondary school-leaving certificate, with a very low rate having the compulsory-education certificate. With respect to the percentage of graduates in Italy, the percentage of employees in this sector with a university degree is much higher (Federcomin-Anasin, 2002).

### 3.3.2 Types of software-houses

The above are of course average data and trends but what is really typical of the "software and services" sector, is its extreme articulation. A recent research study, carried out within a larger research initiative of the Fiom-Cgil trade union identified three types of "software-factories": the "e-business" type, the "technical" type and the "application" type (Bolognani et al., 2001). The first type represents a form of work that is in many ways new in relation to the traditional software-house. The innovative features are related to the needs of the emerging market of internet-based software application systems. The main activities of this kind of companies regard the development and adaptation of components and products. In this type of enterprise, processes are governed by leaders characterised by strong personali-

ties and with high technical expertise. The emphasis is on the short product delivery time connected to highly customised solutions. As far as HR is concerned market factors largely prevail over traditional hierarchical factors: work is self-regulated; working time is usually prolonged well beyond the contractual time; a certain amount of homework is required. The professional system is highly influenced by the central role of the technology, which represents the main shaping factor of competencies and professional identities.

The "technical" type of SW-house shares some dynamic characteristics with the previous "e-business" type but it is characterised by a more linear kind of industrial management of the production cycle. The organisational structure is based on small highly specialised project groups. The production process proceeds through cycles of gradual consolidation of results; nevertheless it is strongly controlled and standardised in order to guarantee the requirements of effectiveness and performance of an increasingly demanding market. The organisation is also influenced by frequent contacts with universities to support the innovation process. The primary competencies are those of technical-scientific nature, though the application side is also important. Therefore the fundamental organisational values are composed of a mix of technological excellence and customer service.

The third type, defined as "application-oriented" is probably more widespread within medium-large IT enterprises. It is characterised by both stable industrial organisation and continuous flows of investments in technology. A *governed development process* is typical of such kind of enterprises in which complex activity flows are managed through specific phases of design and development. The salient aspects of the "application-oriented" type are related to: attention given to critical phases of the production process; focus on functional characteristics and performance of software products; use of technological tools in support of project management and systems life-cycle handling; strategic orientation towards the growth of the enterprise size and market. The organisational structure is characterised by forms of production decentralisation and facilities de-localisation. Crucial competencies are not only the technical but also the commercial ones. HRM is geared towards turn-over control also through dynamic methods for employees involvement and participation.

### 3.3.3 The Software and Services Sector in the Rome Area

The economic situation of the software and services sector in the Rome area, as regards the characteristics, basically reflects the national situation. Rome currently has a population of over 2,800,000 (metropolitan territory), and is thus the most densely populated area in Italy. The rate of activity is greater than the national average (49.1%), but also the unemployment rate (11.7%) is greater than the national one. Rome creates approximately 10% of Italy's Gross Domestic Product. The economic base is expanding at an average annual rate of around 2.5% and annually creates approximately 13,000 new jobs. Over 85% of employment is concentrated in the services sector (Comune di Roma-Ecoter, 2000). The distribution of firms is very close to the national average, as the smaller size is by far the most prevalent: 86.73 % concerning the distribution of firms by employment-size, and 94.75 % concerning the distribution by turnover.

| Classes of employees | Firms | % |
|---|---|---|
| Less than € 500,000 | 3,272 | 86.73 |
| € 500,000 - 5 M | 414 | 10.97 |
| € 5 M - 50 M | 68 | 1.80 |
| € 50 M - 250 M | 14 | 0.37 |
| More than € 250 M | 5 | 0.13 |
| Total | 3,773 | 100.00 |

*Tab. 3 Distribution of firms (software and services) by employment- size classes*
*Source: ISTAT – "ASIA" service, 2003*

| Classes of employees | Firms | % |
|---|---|---|
| Less than 15 | 3,575 | 94.75 |
| 15-50 | 126 | 3.33 |
| 50-100 | 31 | 0.82 |
| 100-500 | 29 | 0.76 |
| More than 500 | 12 | 0.34 |
| Total | 3,773 | 100.00 |

*Tab. 4 Distribution of firms (software and services) by turnover-size classes*
*Source: ISTAT – "ASIA" service, 2003*

According to the inquiry conducted by the Municipality of Rome, software houses and informatics services employed nearly 41,000 in 1999-2000. More recently, after the crisis, employment in the sector totals around 32,000 (according to both "Asia" and "Excelsior", the former attached to the Central Bureau of Census, the latter to Central Office of Chambers of Commerce). The characteristics of the employees in the Rome-based software sector do not differ from those on the national level. Also in the Rome area, they consist of mainly male employees, mostly young, with high educational standards, engaged both with typical (indefinite-term) and atypical contracts. The reference markets of the Rome-based software houses include, in order of importance, industrial companies, distribution and service companies, telecommunication companies, local public administrations banking, and central public administration. The latter seem likely to offer major economic opportunities for Rome's enterprises, although at lower levels than in previous phases of the economic cycle (see First Interim Report).

The present development pace of the sector is perceived by most economic operators as stagnating when compared with the growth levels characterising past years. One interviewee, the ACS President, for example, declared that "the heroic times have ended." The comment was referring to times when the Rome new technology district consisted of a few dozen of pioneering enterprises arising mainly from the encounter between the technical component (often university professors or researchers) and the business component (entrepreneurs willing to take risks and to promote innovation). As a whole, the sector development is much more stable than in the past. In particular, in the first half of the 1990s the SW sector was in crisis, entailing a drastic process of selection in the number of local production units and enterprises: over 30% of the enterprises (or even 50% also considering small one-person organisations) were cut off from the market.

Due to this transition, the level of competition has increased considerably, so that the ma-

jor companies are now interested in all the market spaces, also those having lower value added. Furthermore, in a situation where the demand is relatively lower, the enterprises which in past years have made investments in human resources (personnel) and in various assets (office buildings or premises for increasingly numerous staff, hardware and software, etc.), have adopted strategies for the containment of fixed costs. Therefore, besides resorting to layoffs (for the first time in the sector), the enterprises have at least had to block hiring. All this has of course slowed down the dynamics of the labour market in the ICT sector. While in the 1980s and 1990s, personnel policies were based on *recruiting* and *retaining,* today hardly any personnel are being sought, there being an excess of labour supply (though with the exception of highly specialised and skilled profiles). Furthermore, internal personnel is often more than enough, and in any case, unlike in the past, there is no longer a high propensity by employees to move from one enterprise to another, since they are afraid they will not find alternatives or better positions. The labour turnover within the enterprises, very high in the past, is now practically non-existent.

Forecasts seem to indicate that 2004 will be the year of a stable and lasting recovery, but – as already noted – the repetition of the trends and development rates of the past years are not expected. This new market context also involves changes in the management of labour factor, both in the current phase of transition, and regarding future policies and strategies of development for human resources that will - in any case - remain the main competitive factor in the sector.

### 3.3.4 HRD, Organisation, Learning Processes

**Labour Market**

All companies involved in this inquiry have a labour force structure composed mainly by employees with an indefinite-term contract, while the use of consultants and/or other flexible forms of employment (continuous and co-ordinated collaboration, temporary work, etc.) is absolutely marginal. The explanation for this situation, in contrast with trends in many sectors continuously seeking flexibility, lies in the basic importance of human resources in the ICT sector. The enterprises invest considerable amounts in the recruitment and training of personnel (which in this sector is really continuing training). Therefore, the loss of human resources has a particular impact, and in order to minimise this loss the enterprises try to form a closer link between the employees and the enterprise, both in formal and informal terms (pride of belonging to a group, care of people, etc.).

For about two years, wages have been mostly stable as a direct consequence of the lower growth of the market. The level of wages in the ICT enterprises is almost always structured in a fixed and in a variable component, directly proportional to the results attained (by the enterprise, a project, or a single individual). In the past years, in a market with a very high personnel turnover, the enterprises used wage proposals with production bonuses and increasing benefits in order to retain and produce fidelity in the labour force. Now, and for the immediate future, these policies have less importance, at least as long as the labour market shows low growth rates. In this economic phase, the personnel do not seem to be inclined to seek new 'adventures' and therefore the enterprises need no longer apply measures to avoid the loss of the labour force.

### Industrial relations

Up to two or three years ago, the trade unions have had a marginal role in the enterprises operating in the SW sector. The reason is that with the market situation, where human resources were treated very well, the conflicts on the labour market generally made trade union action superfluous. The crisis, beginning in the late 1990s and continuing in the early years of the new millennium, has led to the entry of the trade unions in the enterprises, above all in those – the larger companies – that have had to apply ordinary and extraordinary layoff measures (social buffers). With more specific regard to vocational training, the involvement of the trade unions is in any case minimal, and when it occurs (actually, the inquiry showed only one case of an active trade-union role), no conflicts of any type have arisen, and a climate of collaboration prevails. This is because the personnel receives a lot of technical and behavioural training, and there is little room for additional bargaining.

### Human resources development

"Care of people" is an aspect heavily stressed by the enterprises in the ICT sector: the circulation of information and the exchange of know-how among the personnel are two of the most effective (informal) methods for learning and the development of skills, on the vertical and horizontal level. This aspect has been recorded in all the enterprises contacted and it occurs as a variable independent from the specific characteristics of each enterprise, such as the size, the organisation of work, year of foundation, etc.). No formal incentives to creativity on the job have been recorded. Nevertheless, as many have stated, the organisation of work itself, as well as the corporate culture and style (and, in some cases, general corporate policy) favour this aspect, although this mainly occurs on the informal level. The SW sector is among those defined as "brain intensive" (therefore, where the main strategic variable is not just the labour factor, but a highly qualified labour factor). It is therefore common for the enterprises to adopt these personnel-management policies that tend to maximise performance and create conditions for the production of new ideas, products and processes.

The form of work mainly used in the enterprises concerned in the inquiry is *project-based*. This is partly determined by the characteristics of the demand, but also by the proposals, on the supply side, which are also fundamentally project-based. The case of the overall organisation of the enterprises is different; in most cases, their structure is by departments or business units (which often coincide). Generally, project teams are organised though specific task assignments, under the control of a project manager, an accountant and experts whose number and type vary according to the type of project. Several interviewees stated that working by project can lead to the best results in terms of circulation of information and enables them to achieve maximum effectiveness and efficiency in relation to the internal development of skills (although this development mainly takes place on the informal level). Often the outcome of this type of management of work is the development of the creative process. This process is reduced as the organisational hierarchy increases, and this hierarchy directly depends, in turn, on the size of the enterprise.

Of course, the level of formality and hierarchical orientation of departments increase with the complexity of corporate organisation. This is a process also found in the evolution of

single enterprises, when these have undergone a phase of rapid growth: in order to govern the organisation of work, the enterprises have had to introduce some 'rigidity' in the corporate organisational chart. It is interesting to point out that only one of the enterprises has declared that it has favoured and created a "community of practice" based on common objectives, languages, styles, and forms of learning. This is a specific corporate policy inspired by the strategies used in Japanese organisations, where pride in belonging to the enterprise is promoted among staff.

The outcome of the application of this organisational philosophy is that the enterprise tends to reward employees more on the basis of a collective result than an individual one. All this, in any case, is neither formalised nor codified, but derives from a series of intangible aspects defining the "style" and identity of the enterprise. It seems possible to confirm the hypothesis that different company behaviours take place in relation to specific conditions of organisation and size. When more informal relationships prevail, organisation and procedures are de-structured and working hours are flexible (i.e. where main aim is the quality results assigned, endowing the worker with maximum responsibility), while the creative process, the circulation of information and the transfer of skills are greater.

### Use of ICT

The use of computers is of course widespread and extensive in SW sector. Larger companies introduced Intranet systems and, in many cases, free access to the web is allowed to all employees. In several visited companies, besides internal databases, there is also a series of tools and IT systems for the management, monitoring and reporting of work. On the contrary, no formal web community has been found, either internal or external, even in the groups with foreign branches. In this sector, ICTs are normal working tools, but it is interesting to note that in any case, despite the wide availability of computers and telemetric equipment and the capacity of use by personnel at all levels, *much importance is also attributed to the direct contact between persons*. The web aspect is considered to be accessory and marginal, and often, as in the case of intranet networks, more than for professional purposes, it is used for general information purposes: corporate news, meetings, etc., but also items for sale by employees.

### Competencies Development

With respect to the classical "make or buy" alternative, the strategy followed by the interviewed enterprises for the acquisition of skills is, in almost all cases, a "make"- type pattern. The reason, once again, lies in the strategic importance of the labour factor in the SW sector. The enterprises provide stable jobs with indefinite-term contracts, and little use of part-time contracts, since they intend to minimise the risk of personnel leaving the enterprise. The loss of employees is normally considered to be a loss of assets, above all due to the heavy investments in training and development of skills made by the enterprises for each worker.

The "buy" approach, i.e. seeking services and skills outside the enterprise, is generally used either for advanced professional profiles or for lower-level personnel. The former are generally recruited in highly specialised enterprises, studios and agencies, or, within the university system; the latter, mainly from software houses or on an individual basis, through seek-

ing on the market. The labour supply is now widespread, complete and often exceeding the demand: thus the high closure rate of enterprises with a low level of specialisation. Outsourcing, which represents the maximum level of outside use (with respect to the use of consultants or of co-ordinated and continuous collaborators), is generally limited to aspects with low added value and not very strategic. It is used to reduce the costs of implementing a contract (or of drawing up an offer) and for having margins of flexibility. Almost all the interviewed enterprises have a database of suppliers from which they continuously receive proposals for collaboration.

Skill shortages for technical profiles are rather diffused. Companies generally complain about the lack of specialised profiles and the consequent losses on competitive capabilities. The seeking of personnel with specialised skills takes place through all the channels available: direct and, when possible, preferential and privileged relationships with the academic world, collaboration with head-hunting firms, newspaper advertising, etc. Difficulties in hiring the appropriate resources for company needs are largely attributed to the education and training system: the experience of candidates in hiring selection processes is often seen as insufficient.

In policies for competencies development and management, the enterprises - being aware of the strategic importance of this factor of production - tend to satisfy the needs of the individual (when this is compatible with organisational requirements) and therefore have forms of tailor-made job design. Training is sometimes also used as an incentive to workers, who can participate in training activities in line with their desires for professional growth. The management of career paths and wage leverages follow the same logic of meritocracy. Several visited enterprises have more or less complex systems for performance measurement. These are systems of indicators which, according to sectoral benchmarks and, in some cases, directly referring to the professional function and position, assess the performance achieved by the individual employees in relation to their objectives. These indicators, besides evaluating the results in quantity terms, often extend their range of action to behavioural aspects, and in this case the subjective component of evaluators is greater. They are used to make decisions on career paths and on the assignment of bonuses, and fringe benefits, etc.

**Different kinds of continuous learning and training initiatives**

In all the visited enterprises, all the personnel (except for some lower-level staff, such as receptionists, etc.) take part in some kind of training initiatives. Both personnel and HRD managers believe that training, whether formal or informal, is a vital tool for expertise enhancement. All the interviewees, while acknowledging the importance of traditional training, believe on-the-job training from undertaking day-to-day activities to be more effective. The interviews furthermore show the importance of self-learning. There is likewise a direct relationship between the importance of self-learning with the position in the corporate hierarchy. Self-learning takes place with the use of various tools: the reading of specialised press, the analysis of internet sites and competitor products, participation in fairs, seminars and conference as well as through brainstorming.

Training is one of the essential components for the development of personnel skills.

Though representing a cost for the enterprises - and some have commented that this is a double cost, since beyond the cost of the courses there are also the opportunity costs related to the removal of staff from their ordinary work, training is considered to be an investment. This applies both to the enterprises and to single workers who are suited to take part in various training activities. A widely used type of training in larger SW enterprises is the traditional training conducted internally with external teachers (who are almost always the majority of the teaching staff). The choice of external teachers is due to the desire to introduce new technical and scientific contributions from the outside. The teachers are often university professors or specialised professionals with a very high level of skills.

Besides traditional training, many enterprises have also said that apprenticeship, practised above all for the insertion of newcomers, must be included in training actions. The most effective method for the updating and acquisition of skills is in any case field experience, promoted by the solving of problems arising in day-to-day work. The category of personnel most benefiting from training actions are technical staff, followed by managers. Technical themes are the most widely taught ones, despite the increasing importance of behavioural aspects. Much training for technical staff takes place by participating in "catalogue courses" conducted by the enterprises producing the most widespread hardware and software facilities (Microsoft, Unix, Oracle, etc.). Participation in these courses is the most rapid tool for certification (i.e. authorisation) so as to use these instruments, which are often the basis for the systems designed for and offered to customers.

In larger firms the total time devoted to training actions can exceed one month per year, including seminars, participation in conferences and meetings, etc., which are often deemed as equivalent to training. Training activities are generally self-financed by the company. The use of public financing is limited since the timing and procedures required eventually to get funds and to provide required administrative and financial accounting are, in almost all cases, considered to be too long and complex, and in the very end too costly. There is no single training model followed by the enterprises. The only generally applicable relationship is the one between the impact of traditional training with respect to on-the-job training, and the size of the enterprise. Traditional training actions (in classrooms with teachers) are greater in the larger companies. On the other hand, the smaller enterprises tend to entrust the qualification and updating of personnel skills to less formal actions, in particular on-the-job training and self-learning.

In practice, training strategies are a combination of traditional classroom training – essential at least to acquire the certification required for the use of programmes and tools acquired on the market – and on-the-job training, with the shadowing of more expert workers, and giving employees problems to solve. Formal events (such as conferences, congresses, seminars etc.) are also significant, but above all self-learning through the use of the sources available for updating (e.g. specialised periodicals) and in this sector directly via the Internet. Moreover the interviews allowed the detection of weak but important signals about the "educational" role which is played, although indirectly, by participation in informal communities with enterprise personnel or external personnel.

In general, traditional training processes are more widespread within larger companies where procedures and assigned tasks are more formal and standardised. On the contrary

SMEs seem to put into practice a mix of formal training, continuous updating through specialised sources, participation in day-to-day organisational learning. This occurs for different reasons: smaller enterprises cannot bear the costs of traditional training; their management is less concerned with the development of traditional programmes; innovative solutions are continuously needed that are also outside canonical solution patterns (reproduced by traditional training initiatives). This is particularly true for small businesses operating independently on the market while those prevailingly working as sub-contractors of major companies tend to show both lower levels of learning and lower interest for any kind of training.

## *3.4 Background Analyses: Radio & TV*

### 3.4.1 Introduction

Data and information elaborated from available literature and statistical sources devoted to analyses of both TV and radio sub-sectors are reported in this section, each one following specific technological and strategic trajectories. Therefore, after a general overview of dynamics at the national level, more in-depth analyses regarding the situation of both sub-sectors in the Rome area are presented. The qualitative aspects of factors influencing personal and firm choices concerning education and training are also considered.

### 3.4.2 Radio and Television in Italy: a general overview

Before 1990, the Italian radio and television sector was substantially deregulated and this led to the proliferation of several private TV and radio stations. The first law regulating the sector was issued in 1990 (*"Mammì" Law*) and introduced concessions for the activity of radio and TV broadcasting, via antenna and cable, thus limiting the birth of new broadcasters and creating a certain order within the existing ones. In Italy, there are currently 14 national television enterprises (3 of the RAI, public concessionary company, and 11 private ones) and approximately 600 local private television enterprises. There are also 20 national radio enterprises (5 of the RAI public concession and 15 private ones) and approximately 1,300 private local radio enterprises (*Certil*, 2002). The Italian TV market is first of all characterised by a significant "duopoly" (the RAI public concession and the RTI - Mediaset Group private concession) controlling 90% of the total Italian audience and sales. In contrast, the radio sector does not show dominant situations like the TV one, since local radio enterprises can effectively compete with national radio networks in terms of audience and advertising revenue.

In recent years, the radio and television system has undergone a deep transformation due to differentiation of media (beside analogue television also cable and satellite television channels have been set up) thus creating synergy and convergence between the telecommunications, informatics and radio-television sectors. Some recent forecasts state that the entire radio and television system will transfer from analogical to digital technology by December 2006. The present situation is therefore a complex period of transition involving a rapid and progressive process of restructuring of technology and human and professional resources development, although most recent inquiries into radio and TV did not take the latter aspect into account. This research study is therefore centred on a still rather unknown

target: the local radio and television companies outside the RAI/Mediaset duopoly.

### 3.4.3 Television

Data on Lazio – the Region in which Rome is located and of which the latter represents the overwhelming reality in terms of population, economic flows and social dynamics – show a high rate of television companies on the national total, ranging around 10%. As a whole 230 concessions/authorisations have been issued for a total of 45 authorised TV broadcasters: this means that Rome is the most important area with regard to local TV broadcasting (Frt report, 2002). However, data shows relatively fragmented television service mainly provided by SMEs, with 44% of the companies falling within the lowest classes of sales.

| Class of Advertising Sales (€) | Number of Companies | % |
|---|---|---|
| 0 to 250,000 | 18 | 44 |
| 250 to 500,000 | 10 | 25 |
| 500,000 to 1 million | 6 | 14 |
| 1 to 1.5 million | 3 | 7 |
| 1.5 to 2.5 million | 3 | 7 |
| over 2.5 million | 1 | 3 |

*Tab. 5 Distribution of Enterprises by Classes of Sales (Latium Region)*
*Source: 'National Observatory on Private Radio and Television Enterprises' (2002)*

In many ways Rome reproduces within its own territory and economy the average characteristic of the Italian TV sector, characterised by a large number of TV broadcasters and more specifically by a large number of local stations. The geographical distribution of these stations seems to be quite concentrated, with a higher density –contrary to what might be expected – in Southern Italy and the Islands, in which, however the average dimension is below the national standards. A good overall picture of the system is provided by the reports of "National Observatory on Private Radio and Television Enterprises", mainly based on economic/financial figures of Italian TV broadcasters. The last available report has taken into consideration all the stations holding concessions or authorisations for TV broadcasting on a regional and provincial basis: 475 profIT oriented organisations and 143 community broadcasters (organisations which, according to the law, represent particular interests in the cultural, technical, political, religious sphere). Therefore in 2001 Italian local television stations totalled the number of 618, of which over half have their registered offices in Southern Italy and the Islands: Sicily (68 broadcasters) and Campania (49 broadcasters) alone represent 26% of the total local broadcasters at the national level. In the year 2000 the overall national television market accounted for approximately € M 6,300. Local broadcasters accounted for € M 310 or approximately 5% of the total income of the television system (including licence fees) and 7% of advertising revenue.

| Networks | RAI | Mediaset | Other National | Local | Total |
|---|---|---|---|---|---|
| € M | 2,710 | 2,470 | 820 | 310 | 6,310 |
| % | 42.98 | 39.07 | 13.04 | 4.91 | 100 |

*Tab. 6 Distribution of Income in the Italian Television System*
*Source: 'National Observatory on Private Radio and Television Enterprises' (2002)*

In particular, the proceeds of the 395 companies surveyed in 2000 were € M 335, of which € M 298 came from advertising, € M 35 from other activities and € M 2 from financial income. The costs totalled € M 340. The advertising sales corresponded to nearly the total of the local market, being almost the only source of proceeds for local television enterprises.

| | Advertising Revenues | Other | Financial Income | Total |
|---|---|---|---|---|
| € M | 298 | 35 | 2 | 335 |
| % | 88.95 | 10.44 | 10.61 | 100.0 |

*Tab. 7 Composition of Proceeds in the 395 Companies Surveyed*
*Source: 'National Observatory on Private Radio and Television Enterprises' (2002)*

In terms of growth, the Italian local television market has not shown a significant increase in its resources, being almost unchanged with respect to 1999. On the whole, only "the other national TVs" recorded an increase of proceeds, due above all to new subscribers to pay-TV. In any case, the media market has grown substantially in recent years and, though much caution is required, a good growth margin is forecast for the future.

As shown in a research study on the audiovisual sector conducted in 1998 by MAGICA (*Master Europeo in Gestione di Impresa Cinematografica e Audiovisiva*) within the OCOFA Project (an EC ADAPT Initiative), the enterprises themselves considerably invest in advertising. Local broadcasters are deemed to have high development potential and profit margins due to positive investment factors such as: programme quality, audience-data certification and the creation of strong regional television systems. Despite its interstitial nature, the local television sector as a whole seems attractive for advertising investors even at the national level given its peculiar relations with the audience. In particular, local broadcasting companies are subject to strong competition from oligopolistic TV broadcasters in the prime-time slots but they often manage to create significant niches at other times of the day, as witnessed by the national *Auditel* system.

This suggests that high average professional levels are required among all those who work in the sector but also that survival in competition is not an easy game. The situation is even more complex considering the continuous changes generated by the digital revolution and the resulting enormous growth of the communications systems as a whole. All this entails that TV SMEs have not only to adopt advanced technological systems but also to find and develop new kinds of qualified professionals. As a consequence, the most significant expectations for survival and development are those of higher level enterprises, already showing higher sales rates and revenues from advertising. The average sales rate for companies is approximately € 738,000, and as we can infer from the distribution by classes of sales, 152 companies exceed € 500,000 while 243 companies (61.51% of the visited enterprises) have advertising revenues below € 500,000.

| Size of Advertising Sales (€) | Number of Companies | % |
|---|---|---|
| 0 to 250,000 | 160 | 41 |
| 250 to 500,000 | 83 | 21 |
| 500,000 to 1,000,000 | 64 | 16 |
| 1,000,000 to 1.500,000 | 41 | 10 |
| 1.500,000 to 2.500,000 | 25 | 6 |
| over 2.500,000 | 22 | 6 |

*Tab. 8 Distribution of Companies by Size of Advertising Sales (Italy)*
*Source: 'National Observatory on Private Radio and Television Enterprises' (2002)*

Of course this panorama differs in the various areas of the country. The distribution of companies by sales highlights that in South-Central Italy most enterprises show average annual sales under € 250,000, while the Northwest and Northeast exhibit a more balanced distribution between the various classes of advertising sales. Lombardy and Veneto have the highest number of broadcasters with sales of over € M 2.5. Basically, the overall panorama of enterprises working in local television broadcasting in Italy includes at least 20 enterprises having very high business standards (in terms of adequate annual sales, broadcasting technology and corporate organisation), 100-120 enterprises of good business standard (annual sales of several million euros and an appropriate corporate organisation) and a large number of small and very small enterprises with few economic resources and a precarious organisational structure.

With regard to employment, considering an overall expenditure for personnel cost being € M 80 and estimating a theoretical average cost of € 25,000 per employee, the research study of the 'National Observatory on Private Radio and Television Enterprises' has recorded 3,109 workers with an average expenditure for each company of € 202,000 corresponding to an average of 7 employees per company. Only companies with sales over € 500,000 have more employees than the average. Those with sales over € M 2.5 spend € M 1.15 with an average of 48 employees each. Basically, 75% of the total employees (2,388) work for the first 152 companies having sales of over € 500,000. The geographical differences are evident: the broadcasters located in Central and in Southern Italy have a definitely lower average number of employees (on average 6 employees) with respect to that of broadcasters located in the North (on average 11 employees). A comparison of data on employment in the 'National Observatory' for the period 1998-2000 reveals a rather limited employment growth in local television companies, considering that the number of companies operating in the sector has increased over that period. This is probably due to the introduction of new digital technology that initially led to personnel cuts and investments in the computerisation of recording processes. This subsequently led to the spread of small, dynamic structures which, as a result above all of the lowering of production costs, can provide high-quality audiovisual products at a highly competitive price. In order to face this competition, some of the larger companies have significantly cut personnel – even up to 40% – in order to relaunch through lighter and more dynamic structures.

### 3.4.4 Radio

According to last available structural data, about 240 radio broadcasters are operating in the Lazio Region (Magica, 1998). As with local television broadcasting, radio broadcasting reproduces the structural configuration of the system at the national level. (The latter occupies one of the top positions in Europe in terms of density). Local radio broadcasting is a rapidly growing sector in Italy, and in particular the radio advertising quota has risen considerably, and this trend seems likely to continue. This is also due to a different market structure in comparison with the television sector: while television is dominated by two giants (one public, one private), none of the radio national broadcasters, public or private, exceed 20% of the total share.

| | Million of inhabitants | Radio broadcasters | Ratio (approx.) |
|---|---|---|---|
| Spain | 39 | 1,150 | 33,900 |
| France | 59 | 1,157 | 50,900 |
| Germany | 82 | 236 | 347,400 |
| UK | 59 | 298 | 197,900 |
| Italy | 57 | 1,320 | 43,100 |

*Tab. 9 Number of Radio broadcasters in European Countries*
*Source: Federcomin 2002*

As in the TV sector, the greatest challenges relate to the impact of new digital technologies with respect to which several radio broadcasters have already adjusted. Those involved in this sector seem to be more aware, than people in TV, about the actions required, and in particular about the training needs to be satisfied. A recent report on the evolution of radio broadcasting (Federcomin, 2002) showed Italian radio broadcasting companies have undergone processes of updating linked to the use of the Internet. These have developed from being a purely promotional feature to being a new business area structurally engrained in the business identity of several firms. In 2002, a large majority of radio stations (all those operating at the national level) were on-line and equipped for *streaming* listening frequencies via the web. Furthermore, there is an increasingly widespread use either of audio services and of tailor-made listening forms, or a "community" approach to on-line activities, as shown by the extensive use of community tools such as *chat* lines and *forums*, the creation of *clubs* and the supply of personal and interactive services.

In Italy, since 1995 radio has had a top place among the classical channels for the growth rate of advertising investments. According to recent data (Federcomin, 2002), advertising investments in radio represent just over 5% of the Italian market, quite near to the European average (7%). In years until 2001, advertising investments in radio have grown at a considerable rate, higher than the one characterising the entire market. Total national advertising investments have grown by +16.6% and trends in local advertising were quite positive (+13.6%). From 2001 such trends seem to decrease, but nevertheless the level of long-term expectations remains high due to the intrinsic potential of the medium.

The sector is undergoing a process of rationalisation also due to the entry of new enterprises from other segments of the media sector (newspapers) whose aim is to exploit the

potential of radio in terms of advertising revenues (although new legal constraints could limit such advertising revenue prospects). In general, local advertising still seems to have expansive perspectives for the future: according to recent estimates (source: UPA), the growth in investments could range around 6%. Significant expansive perspectives are forecast for radio businesses operating within the *syndication* model, based on networks of radio stations holding local concessions which broadcast common programmes (produced by a leading company) for a maximum of 6 hours per day and sell both local and national advertising.

### 3.4.5 HRD, Organisation, Learning Processes

#### Human resource development

Autonomy is the most important characteristic of human resource dynamics within the radio sector where work relations generally reflect individual and group independence. Even in contexts which are more highly structured because of their dimension and complexity, firm social relationships are usually developed in a climate favourable to employees autonomous activity and development. The main limits to such characteristics are constituted by job instability for many employees. Although larger private radio and television companies employ stable professional staff, the dynamism of the sector as a whole is made possible by high labour flexibility and by the limited extension of the "protected area" of indefinite-term work, especially in smaller businesses. In several cases job stability is limited to "core" personnel involved in management and administration, while crucial professional and operational activities are carried out by volunteers (in non-profit radio stations) or by quasi professionals. "Autonomy" in these cases can mean casual relations with colleagues and lack of any significant perspective of professional development within the organisation. But such kind of trends seem limited to lower quality radio and TV stations.

#### Work Organisation

The really significant evolutionary patterns of radio and television production systems seem at present radically different from the traditional industrial ones. Organisational and technological structures have been substantially reshaped by innovation processes which changed consolidated equilibria within both the role systems and the function boundaries. For instance, the distinction between roles previously sharply separated – like those of journalists, cameramen and editing operator – tend to be at present blurred. Portable digital video cameras and connected equipment enable the same person to organise the service, to make interviews, to do the shooting and to edit services. Of course, regarding shooting and editing, more complex operations can be needed, requiring the intervention of specialised personnel with specific competencies and continuous technological updating. But the role system as such has been changing. The role of radio and television journalists has undergone a process similar to that of newspaper journalists, radically transformed by the use of the Internet and e-mail (regarding the sources of information and documentation) and by the introduction of publishing software (which entailed the absorption of most of the functions once provided by printing workers).

Also at the higher management levels, in private radios and TVs, it is unusual to find managers who have not at some time worked directly or indirectly with cameras, editing or broadcasting facilities. In such conditions teamwork is absolutely fundamental, although several activities are performed individually. Core moments for teamwork are those of daily meetings, which in fact constitute the context for multi-purpose activities, aimed at information exchange, problem-solving, evaluation of professional performances, development of new ideas, projects and methods. No specific formal incentive tool for creativity is in place in such working realities since it is considered an intrinsic feature of work. No formal incentive to co-operation is in place either, as it is a pre-requisite for collective performance. In more structured (larger sized) working situations, structural orientation towards teamwork seems to bring about the creation of real communities of practice in which work objectives are continuously negotiated, although often unconsciously, and different forms of mutual help and communal learning take place.

### Use of ICTs

As already mentioned, ICTs are increasingly key in production processes of radio and TV companies. New digital technologies, evolutionary in relation to previous analogue technologies, have been introduced. They require new professional competencies in using computers, in communicating through telemetric networks, and in operating electronic devices for recording and reproducing images and sounds. Technological innovation has reshaped operational contexts creating a continuum between new software, hardware and organisational-social routines. Therefore individual and collective mastery of new socio-technical contexts is considered a crucial requisite, but given the intense pace and quality of technological innovation, it is rare that competencies acquired within formal education processes and even through traditional vocational qualifications could match real working exigencies. Moreover, unlike in the software sector, providers of new technologies seldom offer courses and other training facilities, which are not essential to acquire licences for equipment operation. Hence individual and organisational updating initiatives are vital in order to keep in touch with what is new in the field and to stay competitive in the labour market (for individuals) and the product market (for firms). Such updating is a function of the qualification level and ambitions of individual professionals and of the dynamic capabilities of firms.

### Competencies Development

Concerning the "make or buy" attitudes in relation to needed professional resources, the former tend to prevail in situations in which a certain level of stability in business performances is achieved and the companies try to reinforce the levels of autonomy and reliability of their own teams. These attitudes are based on, and in turn enhance, the continuous self-learning processes developed individually and within informal work communities. In this regard the radio and television sector is highly representative of the structural post-fordist trend whereby knowledge and experience accumulated by individuals and groups through social learning processes can be assumed as core within company value-creating assets. Personal choices and firm choices co-evolve and can find points of balance. Competencies development in this sector depends in some ways on firm strategies concerning work organisation and – as referred below – training initiatives. But probably more than this it depends on individualised paths towards professional achievement, based on specific educa-

tion and working life choices in which technical and self-entrepreneurial aspects are strictly intertwined.

**Different kinds of continuous learning and training initiatives**

Due to the above trends learning and training appear as belonging to different spheres having difficult reciprocal relations. Learning processes mainly take place outside traditional training models (based on classroom courses, formal teaching, prescribed curricula, etc.) and develop informally in terms of problem-solving and knowledge sharing. Of course training is not completely disregarded as it allows the acquisition of relevant external knowledge. However the interest for formal training activities is of a very pragmatic nature from both individuals and firms. Enterprises characterised by a more complex internal organisation and resources availability actually develop some in-house courses and/or buy some external courses. Within organisationally less developed situations access to formal training activities is left to individual choices. In both cases what seems significant is the reference to real needs.

Publicly financed VET activities play a difficult role in this general context considering that very often they are not regularly updated in relation to training need (in particular as far as recent technological advances are concerned) and are related to very specific job profiles. However, organisational and technological development – as already mentioned – increasingly inhibits the crystallisation of competencies and neat separations between professional categories). A fundamental constraint is also constituted by the rigidity of the attendance model which takes away busy SME managers and employees for courses. Voluntary attendance at short refresher courses outside working hours is often the only solution available for integrating formal external knowledge within learning backgrounds continuously fed through experience and social exchange.

## *Results from Questionnaire-Based Inquiries*

## *3.5 Software Production*

### 3.5.1 Composition of the Samples

The first sample of the survey (direct interviews) consisted of 18 persons (1 woman and 17 men) employed in enterprises operating in the Rome area in the sector of software applied to ICTs and business services. The second sample (telephone interviews based on the simplified questionnaire) comprised 83 persons (15 women and 68 men) employed in the same sector. In particular, the enterprises of the second sample deal mainly with software development and services, network management, and web-related activities. The sample also contains, although to a lesser extent, enterprises that operate in the above sub-areas but also deal with hardware activities and data-processing. In both samples data regards mainly professionals ("technicians") holding full-time jobs and "typical" long-term contracts. In some way this does not fully represent the reality of sector in which part-time and "atypical" contracts are widely diffused. However, the interviewed population shows problems and perspectives very coherent with the inquiry goals (about CVET and related aspects). The quite wide and diversified variety of activities can be considered as representative of

the current structure of software and IT service enterprises involved in data processing and network transmission. Overall, the variety of activities included in the samples of "software enterprises" are diverse, with companies tending towards specialisation in different sectors of digital technology.

### 3.5.2 Enterprises in the Samples

Interviewees in the first sample mainly work in medium-sized enterprises and/or local businesses (10-249 employees), except for 2 respondents who work in very small firms. The second sample (of 83) shows a similar breakdown with an evident concentration in the group of medium-sized enterprises (10-249 employees), which represents almost 70% of the total. The number of employees in the local units where interviewees worked was nearly always fewer than 100.

| | % |
|---|---|
| **less than 10 employees** | **11.1** |
| 10-49 employees | 38.9 |
| 50-99 employees | 11.1 |
| 100-249employees | 22.2 |
| More than 249 employees | 16.7 |
| Total | 100.0 |

*Tab. 10 Firms in which interviewees work by size of enterprise (first sample n = 18)*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| less than 10 employees | 22.2 | 30.1 |
| 10-49 employees | 44.4 | 44.6 |
| 50-99 employees | 16.7 | 19.3 |
| 100-249employees | 16.7 | 4.8 |
| More than 249 employees | 0.0 | 1.2 |
| Total | 100.0 | 100.0 |

*Tab. 11 Size of local units where interviewees worked*

In terms of changes in turnover and number of employees, the performance of enterprises in the first sample showed similar trends. Over half highlight improvement in terms of sales and employees, and one third emphasised stability in these indicators. On the other hand, a few enterprises showed worsening economic and employment figures.

| | Turnover | Employ-ment |
|---|---|---|
| | % | % |
| Increase | 50.0 | 55.6 |
| Stable | 33.3 | 33.3 |
| Decrease | 16.7 | 11.1 |
| Total | 100.0 | 100.0 |

*Tab. 12 Performance of firms in the first sample. Turnover and Employment*

### 3.5.3 The interviewees

In both samples, the interviewees are mainly (over 70%) aged under 40, consistent with the image of a very dynamic sector, open to young people who have been able to drive their own education and work paths towards new technologies. But also the older segment of the second sample is active in web services, which can be considered as the most innovative segment of the IT industry, thus showing a considerable capacity to learn in the long term. The school education of the interviewees is of medium-to-high level with approximately 30% of the individuals, in both samples, holding a university degree, while the others have attained at least an upper-secondary school-leaving certificate.

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Less than 30 | 22.2 | 20.5 |
| 30-40 | 50.0 | 51.8 |
| More than 40 | 27.8 | 27.7 |
| Total | 100.0 | 100.0 |

*Tab. 13 Age*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Compulsory education certificate | 0.0 | 0.0 |
| Diploma secondary school | 61.1 | 66.3 |
| University degree | 38.9 | 33.7 |
| Master or Phd | 0.0 | 0.0 |
| Total | 100.0 | 100.0 |

*Tab. 14 Educational profile*

The samples are characterised by a medium-to-high professional level with activities classified as "professional" or middle-managerial / professional, with appropriate educational qualifications. Although software firms traditionally make extensive use of atypical contracts, in the first sample 72.2% of the interviewees hold an open-ended employment contract. The diffusion of traditional contracts can be explained by two factors: the size of the enterprises involved, which is limited in the majority of cases but not close to minimal dimensions where atypical contracts are normal. The average annual gross wages recorded in the first survey is concentrated on a medium-high level (25,000-49,999 euros), consistent with the quality of involved professional profiles.

| | Sample I |
|---|---|
| | % |
| Subordinate employment contract | 72.2 |
| Collaboration contract | 11.1 |
| Atypical forms | 16.7 |
| Total | 100.0 |

*Tab. 15 Contract forms*

| | Sample I |
|---|---|
| | % |
| Less than 13.000 | 5.9 |
| 13.000-24.999 | 23.6 |
| 25.000- 49.999 | 47.0 |
| 50.000-99.999 | 17.6 |
| More than 100.000 | 5.9 |

*Tab. 16 Wages (gross wages)*

The low average age of the sample implies a reduced seniority within the current position in the enterprise (most interviewees have less than 5 years experience). But in many cases, even if limited, such work experience is not the first. The sample reveals a low starting age for work, 62.5% were aged under 25, while only the university graduates started working between 25 and 30. The overall picture of interviewees is of people who occupy important positions, emblematic of the ICT sector, of higher quality than the Italian average and who possess significant levels of education, professional competencies and wages. For medium size ICT enterprises to remain competitive, it is necessary to employ highly skilled personnel, and - as in the sample - people who possess previous work experience, since basic education alone is insufficient to achieve a competitive edge in these markets. Since this kind of employee is hard to find, the enterprises must offer job positions better than average in the traditional labour market, in order to beat competitors in other business sectors.

### 3.5.4 Characteristics of participation in work activities

The current job position has been evaluated as stable by 72.2% of the first sample with only 11.1% of interviewees considering their job to be at risk. This is due to both market conditions of the firms and self-reliance of interviewees, holding medium-high level of expertise, as it is confirmed by only a small percentage of respondents in both samples considering their work as banal, and 42.2% of the second sample and 61.1% of the first state they do fairly complex work.

| | Sample I |
|---|---|
| | % |
| Stable | 72.2 |
| With some uncertainty | 16.7 |
| With high level of uncertainty | 11.1 |
| Total | 100.0 |

*Tab. 17 Job stability*

A positive relation among complexity and job position revealed how nearly all the interviewees of higher profiles assess their work as complex with a decreasing trend for lower job profiles. Experience continues to play a crucial role on interviewees' professional competence. A majority of them, in both samples, have stated that experience still has a major impact and that they still are far from a full deployment of needed expertise.

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Experience very important | 66.7 | 44.6 |
| Experience quite important | 22.2 | 43.4 |
| I have already reached all expertise needed by my work | 11.1 | 12.0 |
| Total | 100.0 | 100.0 |

*Tab. 18 Value of experience*

Concerning functions delegation and role width, in the first sample a series of specific questions were asked (about decision-making, budget control and human resource management). Analysis of the data shows that the majority of interviewees consider they have satisfactory decision-making power (88.9%) and a sufficient span of control concerning HR allocated for co-operating in work processes (72.2%). But at the same time, the majority cannot manage a budget autonomously (38.9% do).

| | Sample I |
|---|---|
| | % |
| Decision making | 88.9 |
| Human resources management | 72.2 |
| Financial resources allocation | 38.9 |

*Tab. 19 Autonomy*

The first sample is also characterised by openness, with frequent external relationships in 88.9% of the sample, that may derive from the characteristics of client-relationships in companies selling applications while also providing direct assistance services, therefore requiring high levels of client/service co-operation. Concerning quality of work, almost all the interviewees derive personal satisfaction from their work (94.4%) although it is (very or quite) fatiguing and stressful (94.4%), while only in 27.8% of the cases work has a negative impact on private life. The second sample confirms the results of the first one as regards quality (negative for only 8.4% of the interviewees) and commitment at work (fatiguing for 94%). Two thirds of the interviewees of the first sample perform part of their work engaged in teamwork; this activity - which is quite intensive since 75% of the respondents spend over half their time in teamwork - indicates the need for co-operation linked to the high level of specialisation. Information sharing within the enterprise is a consolidated factor in both samples (over 90% of the cases). Meetings, both periodical and occasional, are less frequently considered the best way for sharing, while informal exchanges are regarded as the most suitable by many respondents.

| | % |
|---|---|
| Periodical and formal meeting | 33.3 |
| Not periodical meetings | 27.8 |
| Informal meetings | 83.3 |

*Tab. 20 Information sharing through meetings*

### 3.5.5 Competencies development

According to 83.3% of the first sample, and 56.6% of the second, their work practices generate major effects in terms of competence development, showing the implicit existence of a model of cumulative on-the-job learning that is widespread in the sector. Moreover, most enterprises (72.2% of first sample and 75.9% of the second) ensure forms of incentives targeted to the professional growth of the workers.

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Much relevant | 83.3 | 56.6 |
| Quite relevant | 16.7 | 37.3 |
| Not relevant | 0.0 | 6.1 |
| Total | 100.0 | 100.0 |

*Tab. 21 Relevance of work experience for competence development*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Yes | 72.2 | 75.9 |
| No | 27.8 | 24.1 |
| Total | 100.0 | 100.0 |

*Tab. 22 Recognition of competence development through rewards and incentives*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Internal training courses | 55.6 | 65.1 |
| External training courses granted by the company | 55.6 | 59.0 |
| External stage and study periods granted by the company | 11.1 | 13.3 |
| Favouring the exchange of experience among internal personnel during the ordinary work activities | 77.8 | 79.5 |
| Favouring mobility between firm's units | 27.8 | 26.5 |
| Other methods | 11.1 | 3.6 |

*Tab. 23 Instruments for promoting knowledge development*

The enterprises provide the interviewees with a wide variety of instruments, ranging from the exchange of experience to training courses. The exchange of experiences is the most widely used method (reported by almost 80% of both samples). In practice, the enterprises

use formal training together with informal strategies. The personal evaluation of this combination by interviewees largely coincides with the choices of their firms of instruments for knowledge development.

| | % |
|---|---|
| Internal training courses | 38.9 |
| External training courses granted by the company | 61.1 |
| External stage and study periods granted by the company | 38.9 |
| Favouring the exchange of experience among internal personnel during the ordinary work activities | 66.7 |
| Favouring mobility between firm's units | 22.2 |
| Other methods | 22.2 |

*Tab. 24 Evaluation of instruments for knowledge development by interviewees (effective instruments - score 4 or 5 on scale)*

### 3.5.6 Role of ICTs in Work and Learning

In software enterprises, ICTs play a key role, being at the same time the working instrument and the product/service provided. All interviewees use personal computers, and in both samples, an under 50% utilisation-rate is exceptional, as most interviewees (respectively 61.5% and 50.6% in the two samples) use them for over 75% of their working time. Besides being used extensively, the computer is deemed to be a creative instrument for almost all the interviewees. Creativity in using computers derives from the kind of task performance typical of the interviewees, non-routine but related to problem-solving abilities and intensive know-how applications.

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Less than 50% of the time | 7.7 | 6.0 |
| Between 50% and 75% of the time | 30.8 | 43.4 |
| Between 75% and 100% of the time | 61.5 | 50.6 |
| Total | 100.0 | 100.0 |

*Tab. 25 Use of personal computer*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Much | 50.0 | 41.0 |
| Quite | 33.3 | 47.0 |
| Little | 16.7 | 12.0 |
| Total | 100.0 | 100.0 |

*Tab. 26 Creative use of personal computer*

Creativity and the building of new skills due to the personal computer are strongly related to the intensity of computer usage. Thus, in both samples, nearly all the respondents who spend less than half their working time with a PC find a small contribution to creativity and competence development, while those who spend all the time in front of a PC have the greatest opportunity of taking advantage in terms of creativity and skills. The intensity of computer usage suggests the changing relevance of the PC by generations. In both samples

people using PCs for less than 50% of their working time were more than forty, with younger people spending more time in front of a PC. There was also a strong generational influence in the criticality of the PC as a tool. E-mail and Internet and connectivity are consolidated aspects of work in the sector. All respondents of the first sample have an e-mail address, and 72.2% make intensive use of e-mail facilities. E-mail and the web are widely used (94.4% of the first sample) as instruments for swift information acquisition.

### 3.5.7 Learning and Training

Training at the beginning of the work activity in the enterprise is crucial for the transmission of consolidated internal know-how. On the basis of their experience, the interviewees of the second sample recognised the importance of shadowing with senior experts (65.8%) while training, although not disregarded, seemed to play a less relevant role (24.6%). Considering access to training activities is linked to updating needs, training is widely used in the sector. Enterprises tend to keep the alignment with innovation dynamics in technological and market environments also through courses and other initiatives. All respondents participated in training activities attending both technical courses and role-behaviour courses. Technical training is prevailing but the percentage of those attending both types of courses appears significant (35.3% and 32.5% in the two samples) showing that an impact is expected from training both for professional technical advancement and for career prospects.

| | Sample II |
|---|---|
| | % |
| Shadowing with expert personnel | 65.8 |
| Training courses | 24.6 |
| Other | 9.6 |

*Tab. 27 New entrants participation*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Only technical courses | 64.7 | 63.8 |
| Only role-behaviour courses | 0.0 | 3.8 |
| Both types | 35.3 | 32.5 |
| Total | 100.0 | 100.0 |

*Tab. 28 Typologies of training courses attended by interviewees*

Training can be considered as a significant leverage also within dynamic work environments in which important quotas of knowledge for development can be acquired through informal exchanges. Such an important result is reinforced by the analysis of responses to the question "How much value do both experience and the acquisition of information (transferred through books, handbooks, Web sites…) have for learning and professional development?" Both modes receive a high score: experience comes first as usual but codified knowledge is assumed as important respectively by the 66,7 % of the first sample and the 50,6 % of the second sample. A greater consideration of experience does not decrease the importance of codified knowledge. Also individual choices seem to valorise the written

forms of knowledge circulation (books etc. are scored 94.4% and 96.4%), and the opportunities provided by the Internet. On-line forums and news-groups are valued by some, given the important chances they offer to find the right information easily and at low cost.

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Experience | 94.4 | 84.3 |
| Codified knowledge | 66.7 | 50.6 |

*Tab. 29 Importance of experience and codified knowledge*

| | Sample I | Sample II |
|---|---|---|
| | % | % |
| Attending internal training courses | 50.0 | 65.1 |
| Attending external training courses | 22.2 | 21.7 |
| Exchanging information and experience among internal personnel | 88.9 | 94.0 |
| Exchanging information with external people | 88.9 | 83.1 |
| Reading books, magazines | 94.4 | 96.4 |
| Internet | 83.3 | 74.7 |
| News group and on-line forum | 44.4 | 30.1 |

*Tab. 30 Individual choices for personal competence development*

## *3.6 Radio & TV*

### 3.6.1 Composition of the Samples

The first sample of the survey (direct interviews) consists of 2 women and 6 men employed in enterprises operating in the Rome area in the television and radio sector, more specifically in audio and video activities ranging from production to post-production and support services. The second sample (telephone interviews) consists of 7 women and 11 men employed in companies operating in the television and radio sector (including audio and video production and post-production services) and new related technological sectors, such as satellite broadcasting and digital radio. In both samples, as in the SW sector, data relates mainly to professionals ("technicians") holding full-time jobs and "typical" long-term contracts, while several radio and TV broadcasters, especially the smaller ones, employ part-time "atypical" professionals. However, more regular employees can provide clearer inputs in relation to inquiry goals (about CVET and related aspects).

### 3.6.2 Enterprises in the Samples

The respondents of the first sample work in medium-to-small enterprises and/or local businesses, with a lower average size than those in the IT sector. Enterprises of the second sample reflect the downsized characteristics of the first, with 15 of the local businesses having fewer than 50 employees, and no interviewees working in firms with more than 249 employees. The performance indicators show that respondents belong to companies still in, or just out, of a crisis situation with low or no improvement in sales and, in half the cases, recent employment cuts.

| | Firms |
|---|---|
| Less than 10 employees | 3 |
| 10-49 employees | 4 |
| 50-99 employees | 0 |
| 100-249 employees | 0 |
| More than 249 employees | 1 |
| Total | 8 |

*Tab. 31 Distribution of first sample by firm's employment-size*

| | Sample I | Sample II |
|---|---|---|
| Less than 10 employees | 4 | 8 |
| 10-49 employees | 3 | 7 |
| 50-99 employees | 0 | 1 |
| 100-249 employees | 0 | 2 |
| More than 249 employees | 1 | 0 |
| Total | 8 | 18 |

*Tab. 32 Distribution by productive units employment-size classes*

| | Turnover | Employ-ment |
|---|---|---|
| Increase | 1 | 2 |
| Stable | 3 | 4 |
| Decrease | 4 | 2 |
| Total | 8 | 8 |

*Tab. 33 Performance of firms in the first sample. Turnover and Employment*

### 3.6.3 The interviewees

The interviewees of both samples show a relatively mature structure considering the age groups: most of them are ranged within the intermediate group in the second sample (11), while in the first sample 3 are aged between 30 and 40 and half of them are over 40. The distribution by age indicates a transition and a generation leap that increasingly characterises the transformation of the television and radio sector towards a contents-based industry. An evident effect regards the replacement of many traditional competencies by a new generation of professional profiles. While the first sample only includes people holding upper secondary educational diplomas, the second sample includes also two persons holding higher educational qualifications.

| | Sample I | Sample II |
|---|---|---|
| Less than 30 | 1 | 1 |
| 30-40 | 3 | 11 |
| More than 40 | 4 | 6 |
| Total | 8 | 18 |

*Tab. 34 Age*

| | Sample I | Sample II |
|---|---|---|
| Compulsory education certificate | 0 | 0 |
| Diploma secondary school | 8 | 16 |
| University degree | 0 | 1 |
| Master or Phd | 0 | 1 |
| Total | 8 | 18 |

*Tab. 35 Educational profile*

In comparison with those in the software sector, both samples show a lower level of basic qualification probably due to both:

– the structure of the sample, older than the one in the SW sector, statistically favours the prevalence of upper-secondary education graduates (since the growing
– number of university graduates in the workforce is a relatively recent phenomenon on the Italian labour market);
– the different structure of job contents which, in comparison to the other one, include also a quota of generalists or less technically qualified.

The open-ended subordinate contracts account for 6 people in the first sample, while atypical forms of contracts, widespread in this sector, are under-represented (only one interviewee had a non-traditional employment contract). Average annual gross wages are concentrated on a medium-high level (€ 25,000-49,999). All the respondents of the first sample are full-time employees and all started work before the age of 25 (consistent with the fact that the sample consists wholly of 'upper secondary education' graduates) in other enterprises. Moreover, 2 persons of the first sample have work experience of over ten years in the current enterprise while only 3 have been working there for less than 5 years.

| | Sample I |
|---|---|
| Open-ended employment contract | 6 |
| Collaboration contract | 0 |
| Atypical forms | 2 |
| Total | 8 |

*Tab. 36 Contract*

| € | Sample I |
|---|---|
| Less than 13,000 | 0 |
| 13,000-24,999 | 2 |
| 25,000- 49,999 | 4 |
| 50,000-99,999 | 2 |
| More than 100,000 | 0 |
| Total | 8 |

*Tab. 37 Wage (gross wage)*

### 3.6.4 Characteristics of participation in work activities

The interviewees of the first sample of the television and radio sector appear to be quite optimistic on the stability of their job since for 6 of them, this activity is stable and for 2 there is only some uncertainty in the future in this regard, even though the performance of

the enterprises in which the interviewees work has not been brilliant. Evidently for the great majority of respondents the crisis is over and a new cycle seems underway. In any case, such optimism appears justified by the high competence level that makes the interviewees less vulnerable. None of the respondents in either of the samples considers his/her work as banal; on the contrary, 6 persons of the first sample and 7 of the second sample state their work is highly complex (in the second sample, the remaining 11 persons consider their job as characterised by average complexity). Most of the interviewees, in both surveys, express a positive evaluation on the function of experience for the full development of their abilities.

| The job is | Sample I |
|---|---|
| Stable | 6 |
| With some uncertainty | 2 |
| With high level of uncertainty | 0 |
| Total | 8 |

*Tab. 38 Job stability*

| | Sample I | Sample II |
|---|---|---|
| Experience very important | 4 | 10 |
| Experience quite important | 3 | 6 |
| I have already acquired all expertise needed in my work | 1 | 2 |
| Total | 8 | 18 |

*Tab. 39 Value of experience*

At the same time the idea of the need for continuous improvement of work abilities and performances is widespread. Only one interviewee believes he has already reached a peak in his competence development. On-the-job learning thus plays a key role in competence development, considering the average lack of an initial level of appropriate education and given the complexity of the work performed. Learning from practice plays a key role in the TV and radio sector in comparison to other service and industrial sectors while the mastery of large amounts of codified knowledge seems less important. Concerning work conditions, enterprises allow 5 people of the first sample a considerable autonomy in terms of decision-making power and human resources management, while autonomy in terms of financial resources is less widespread. It is also true that the less frequent autonomy regarding the use of financial resources could stem neither from the lack of trust nor from an insufficiently high professional level of the respondents, but rather from the size structure of the sample involving enterprises with under 50 employees, in which accounting and auditing systems are concentrated within the top functions.

| | Sample I |
|---|---|
| Decision making power | 5 |
| Human resources management | 5 |
| Financial resources management | 3 |

*Tab. 40 Autonomy*

External relations are quite widespread (7 cases in the first sample) and seem to imply a high level of collaboration of surveyed enterprises with other enterprises, also in relation to the diffusion of sub-contracting services. Quality of work is unanimously evaluated as good in 5 cases or even excellent (3 cases in the first sample and 6 in the second). At the same time not one respondent considered his/her work was not fatiguing and stressful. Indeed, as highlighted by about a quarter of the cases in both samples, they consider their job to be complex and to require much commitment. On the other hand, all the interviewees of the first sample are extremely satisfied with their job. In half the cases, despite the considerable commitment, they perceive no negative impact on their private life, while the other half state their work has positive effects. Teamwork is a normal pattern of work activity for 7 cases of the first sample and absorbs over half the time spent in the enterprise. Its importance is highly correlated to opportunities for information sharing and to the maintenance of organisational relations. Formal and periodical meetings are not disregarded but the exchange of information and ideas that occurs spontaneously in informal situations is considered much more important.

| | Sample I |
|---|---|
| Periodical and formal meetings | 1 |
| Formal but not periodical meetings | 1 |
| Informal meetings | 4 |

*Tab. 41 Information sharing through meetings (effective instruments - score 4 or 5 on scale)*

### 3.6.5 Competencies development

Confirming the above results, in both samples all but one of the respondents expressed a strongly positive opinion on the relevance of work experience in improving their own know-how.

| | Sample I | Sample II |
|---|---|---|
| Very relevant | 8 | 17 |
| Quite relevant | 0 | 1 |
| Not relevant | 0 | 0 |
| Total | 8 | 18 |

*Tab. 42 Relevance of work experience for competence development*

Most enterprises in the television and radio sector, in both samples, recognise individual competence developments through rewards and incentives, with 5 persons working in such enterprises in the first sample and 13 in the second.

| | Sample I | Sample II |
|---|---|---|
| Yes | 5 | 13 |
| No | 3 | 5 |
| Total | 8 | 18 |

*Tab. 43 Recognition of competence development through rewards and incentives*

Besides economic incentives, enterprises provide the individuals in both samples with a wide variety of instruments for promoting the growth of knowledge.

| | Sample I | Sample II |
|---|---|---|
| Internal training courses | 3 | 9 |
| External training courses granted by the company | 3 | 8 |
| External stage and study periods granted by the company | 1 | 2 |
| Favouring the exchange of experience among internal personnel during the ordinary work activities | 8 | 14 |
| Favouring mobility between firm's units | 1 | 2 |
| Other methods | 0 | 0 |

*Tab. 44 Instruments for promoting knowledge development*

The individuals in the first sample have also given an evaluation of these instruments provided by the enterprises and their interpretation. The results show an overall agreement with the policy of the enterprises.

| | Sample I |
|---|---|
| Internal training courses | 2 |
| External training courses granted by the company | 3 |
| External stage and study periods granted by the company | 3 |
| Favouring the exchange of experience among internal personnel during the ordinary work activities | 7 |
| Favouring mobility between firm's units | 2 |
| Other methods | 0 |

*Tab. 45 Evaluation of instruments for knowledge development by interviewees (effective instruments - score 4 or 5 on scale)*

The widespread positive evaluation regarding the exchange of experience is evidently due to factors such as their immediate nature, flexibility and limited cost. But training and other external instruments are not at all disregarded but appear as subsidiary measures within firm policies. Mobility, which should have remarkable effects on knowledge development, is surprisingly valued as important by only one quarter of interviewees.

All these figures seem to confirm the hypothesis that a general appreciation of the "human capital" value is widespread in firms' policies and in individual behaviours as well. Job stability, continuous accumulation of know-how and on-the-job learning appear as powerful internal antidotes to recurrent crises due to market dynamics and to the risk of losing competitiveness because of lack of internal resources. Training is one of the ways for competence development but not the most important: it appears as an element of a larger combination.

### 3.6.6 Role of ICTs in Work and Learning

Information technologies have become essential for respondents' work. Both the internal organisation (based on teamwork) and the external inter-firms relationships (largely based on sub-contracting) represent factors for the spread of computer-based work patterns, in-

cluding the use of e-mail and the access to the Internet. In almost all the cases, the interviewees of both samples use personal computers more than 50% of their working time (7 cases in the first sample, 16 in the second).

| | Sample I | Sample II |
|---|---|---|
| Less than 50% of the time | 1 | 2 |
| Between 50% and 75% of the time | 3 | 9 |
| Between 75% and 100% of the time | 4 | 7 |
| Total | 8 | 18 |

*Tab. 46 Use of personal computer*

Computers are not only used for the execution of routine activities but also – to a larger extent – for creative work activities which significantly contribute to the competence development of users (7 in the first sample, 16 in the second.). This is to be correlated both to the nature of work performed by respondents, far from the repetitive patterns of many other service and industrial sectors, and to more generalised processes of digitalisation occurring in this area of activity (see earlier background analysis). Computers are also widely used for information and networking purposes: the first sample of respondents regularly use e-mail in 6 cases and the Web, especially for information search, in 5 cases.

| | Sample I | Sample II |
|---|---|---|
| Much | 3 | 6 |
| Quite | 4 | 10 |
| Little | 1 | 2 |
| Total | 8 | 18 |

*Tab. 47 Creative use of personal computer*

### 3.6.7 Learning and Training

The in-company pathway of the majority of interviewees of the first sample (5) started with apprenticeship and shadowing with expert personnel rather than with training courses. Training courses largely relate to technical training. No new entrant received only courses aimed at forming their own role abilities, while in some cases (1 case and 2 cases respectively for the first and the second sample) technical training is reported as associated with some form of behavioural training.

| | Sample I |
|---|---|
| Shadowing with experts | 5 |
| Training courses | 3 |
| Other | 0 |
| Total | 8 |

*Tab. 48 New entrants participation*

| | Sample I | Sample II |
|---|---|---|
| Only technical courses | 5 | 13 |
| Only role-behaviour courses | 0 | 0 |
| Both types | 1 | 2 |
| Total | 6 | 15 |

*Tab. 49 Typologies of training courses*

Concerning the assessment of such training experiences, the majority of interviewees declare positive effects on their further competence development and career opportunities. As a whole, firms' training policies are less developed in the R&TV sector than in the SW sector. This is likely to be attributed to the smaller size of firms and consequent problems (including cost problems) related to release for training attendance. Consistently, individuals in both samples do not consider codified knowledge as a fundamental source of learning and career advancement, and opt overwhelmingly (in the majority of cases in the two samples) for practical experience.

| | Sample I | Sample II |
|---|---|---|
| Experience | 6 | 17 |
| Codified knowledge | 0 | 1 |

*Tab. 50 Importance of experience and codified knowledge*

However, within a closer recognition of the means that can be considered as apt for professional development, choices appear much more articulated and significant space seems to be open for self-improvement of competencies. Answering a question on individual choices ("What do you try to do in order to improve your competencies") highlights the preeminence of in-company exchange of experience, but other options seem widely practised too. "Exchanging information with external people" is considered a valuable strategy by the vast majority of people, evidently eager to expand the range of their understandings beyond the boundaries of their own organisations. In parallel, at a similar score level, personal updating through reading books and magazines is also considered important. "Attending internal courses", probably implicitly or explicitly addressed to management requests, receives a medium-high score (5 and 10 cases). The very low score attributed to "Attending external training courses" appears as an important indicator of polarisation of attitudes towards training. Such a low score, if compared with opposite trends shown by some life histories, seems to demonstrate a highly selective perception of the training issue: general attitudes towards training are negative (probably influenced by previous bad experiences and consolidated attitudes). The use of the Internet and of on-line facilities is significantly lower that in the SW sector, confirming the different weight of technological communication and fast updating in the two sectors.

| | Sample I | Sample II |
|---|---|---|
| Attending internal training courses | 5 | 10 |
| Attending external training courses | 0 | 1 |
| Exchanging information and experience among internal personnel | 8 | 18 |
| Exchanging information with external people | 7 | 14 |
| Reading books, magazines | 7 | 16 |
| Internet | 3 | 9 |
| News group and on-line forum | 1 | 1 |

*Tab. 51 Individual choices for personal competence development*

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## Web sites

AERANTI Associazione di imprese radiofoniche e televisive locali
www.aeranti.it

AGUS Agenzia stampa notizie video
www.agus.it

ANICA Associazione nazionale industrie cinematografiche, audiovisive e multimediali
www.anica.it

Associazione Nazionale Aziende Servizi Informatica e Telematica
www.anasin.it

CERTIL Confederazione Europea delle Radio e televisioni Indipendenti e locali
www.certil.org

Comune di Roma
www.comune.roma.it

Dipartimento XV del Comune di Roma (II U.O. Politiche Economiche e di Sviluppo Innovazione Gestionale e Amministrativa) www.romaeconomia.it

Dipartimento Politiche per lo Sviluppo Locale, per la Formazione e per il Lavoro del Comune di Roma
www.romalavoro.net

Distretto dell'Audiovisivo e dell'ICT^
www.distrettoict.it

Federazione nazionale delle imprese di telecomunicazione, radiotelevisione e informatica
www.federcomin.it

FEDERCOMIN Federazione nazionale delle imprese di telecomunicazione, radiotelevisione e informatica www.federcomin.it

FONDAZIONE CENSIS
www.censis.it

FRT Federazione delle radio e televisioni
www.frt.it

GUIDA ALL'EMITTENZA RADIOTELEVISIVA
www.guidaemittenza.org

Internet Database Connector
www.idcitalia.com

PAGINE RADIO
www.pagineradio.com

REA Associazione di Radio e tv
www.reasat.org

Salone delle Macchine Automatiche e per l'Ufficio
www.smau.it

Società Consortile di Informatica delle Camere di Commercio Italiane per azioni
www.infocamere.it

Unione Italiana delle Camere di Commercio, Industria, Artigianato e Agricoltura
www.unioncamere.it

# 4 Portugal

*Eduardo Figueira*

## 4.1 Summary

The present survey aimed to analyse factors associated to participation in continuing training activities of employed technicians in Agricultural-food industries and in Information and Communication Technologies (ICT) located in Alentejo and Lisboa and Vale do Tejo Regions of Portugal, respectively. More specifically, the study intended to understand how factors associated to participation in continuing vocational education & training (CVET) activities influence employed technicians' decision to participate in those activities. Understanding adult participation in continuing qualification activities will give a relevant contribution not only for promoting participation of the non-participants but also for designing and setting up effective CVET programmes.

This study was theoretically framed by the ISSTAL-model of social participation (Smith & Macaulay, 1980) and already tested in the USA by Cookson (1986) for studying adult participation in learning activities. The study used a cross-sectional survey approach with an instrument specifically developed to collect data from a two-stage stratified random sample drawn from a population constituted by all technicians working in the Agricultural-food industries of the Alentejo Region and in ICT SMEs of the Lisboa & Vale do Tejo.

Data was firstly submitted to (categorical and non-categorical) principal component factorial analysis to identify class dimensions of factors influencing individual's participation in training activities. Relationships between the different factors and participation were estimated by a set of multiple categorical regression analyses framed by a path analysis strategy.

Results show that, in general, the ISSTAL model is useful for explaining and understanding participation of agricultural-food technicians (Alentejo) and ICT technicians (Lisboa & Vale do Tejo) in continuing training activities. However, the theoretical model as such needs some adjustments in order to understand better how and why those factors influence technicians' participation in CVET.

## 4.2 Introduction

Despite the *Lei–Quadro de Educação de Adultos* (Bill for Adult Education) (DL 74/91), and the development of the White Book of Adult Education (1988), Adult Education and Continuing Vocational Education and Training (CVET) in Portugal still carries the mark of a traditional school-like vision. That school-like character of adult education and training, which still predominates nowadays, has held back a broader outlining of the concept. This broadening of the concept would involve the guarantee of an educational offer to the Portuguese adult population, throughout life, allowing the definition of diverse individual paths to reach higher cognitive levels, and certifying the new qualification levels either reached within or without the formal educational system. However, in the last few years, specific educational paths for adults, with organisational modes different from those of regular

schooling, have been created. Those paths have increased the opportunities to adults acquire new qualifications.

Some problems still persist concerning, for example, involvement of the frailer groups and high levels of drop out coupled with low success rates and high training costs. In addition, trainees have difficulties to continue their learning and to see their occupational training reflected in their working conditions. Furthermore, there have been some difficulties in building adequate training spaces and training strategies clearly oriented towards the adult population, markedly different from those of formal schooling. These are some of the problems revealed by the few case studies that have dealt with the assessment of these ongoing training processes. They show that the quality of the education effort greatly depends on the dynamics of the institutional contexts in which recurrent education is developed and on the specific dynamics of the pedagogic teams involved. If these are important variables, it is logical that they should become the focus of political measures to transform the actual conditions of recurrent education. In the meantime, it seems necessary to present initiatives aimed at devising a more flexible curriculum, thus guaranteeing the indispensable adaptation of the curricula to the different types of trainees and to the diverse contexts in which the training is to take place. Above all, it seems useful to make such training less school-like.

Level of qualification of the human resources and the capacity of keeping them continuously qualified constitutes the basis for the success of the Socio-Economic Development in any Region. This is true because adult continuing education offerings help new or expanding business by either providing training for workers to remain professionally updated and/or preparing individuals to go into new professional activities (Moore, 1990). This is also very important because learning skills are required to promote and enhance both individual fulfilment and community development (Delors, 1993).

This condition has more relevance for the less developed European regions where the majority of the existing human resources have a low level of qualification and the business level is relatively low compared to the situation in more developed regions. However, continuing training offerings are also important for the more developed European regions. In fact, a sustainable Development process in the European Union can only be pursued if Europe's less and more developed regions have human resources qualified and able to promote and implement modernisation and technological progress of the business fabric. For this reason, adequate and effective continuing education and training policies have to be developed and implemented if emerging needs of European society are to be met.

Active adults' participation in continuing education activities constitutes then an essential and effective strategy to increase and maintain European workers' employability and to keep the human resources permanently qualified for responding to needs and challenges resulting from the Development process. This is very important not only for promoting business competitiveness but also for combating social exclusion in general, and unemployment, in particular. In addition, developing effective continuing education strategies requires a prospective analysis of organisations' and workers' training needs and requires a scientific understanding of individuals' adaptation to the new characteristics and challenges of the working activities and situations. In fact, due to the new technologies, globalisation,

and the increased business competition, not only organisation of production and structure of employment but also situation of the workplace and workers' functions are subject to rapid change. For this reason, continuing education programming constitutes an essential and effective strategy for a nation, a region, or an organisation to remain competitive in a rapidly changing environment (Hodson *et al.*, 1994). In terms of human capital theory, qualified and skilled individuals are far better able to deal with people and situations in environments characterised by new production processes and new technologies (Spenner, 1990). This is true because level of productivity depends mainly on effective and efficient use of new technologies, and this is only possible with human resources continuously qualified.

Skill and knowledge acquisition by workers through participation in continuing training offerings is not very well accepted by most of small business managers in the Alentejo region. The reason for that is because most small business managers do not consider labour training as an effective business strategy to deal with the increased market competition. They are not prepared for a management perspective that implies increasing employees' responsibility and autonomy over their workplaces, and (2) improving relationships between management and employees (Hodson et al., 1994).

Evaluating, characterising and understanding active adults' behaviour in relation to continuing education opportunities will give an important contribution for designing and setting up effective continuing qualification programmes. This is important because continuing qualification of the human resources constitutes a 'sine qua non' condition to increase business effectiveness and this depends essentially on efficient use of new technologies, which is only possible with human resources continuously qualified. In addition, understanding adult participation in continuing training will make an important contribution to prevent and combat exclusion of the less favoured since it will facilitate participation of those who are out of the labour market.

### *4.3 Active adults' participation in continuing vocational education and training (CVET): a theoretical framework*

Portugal was one of the first countries to have an 'Apprenticeship' Bill approved in Court (Coimbra, 1384). The reason for that was that the development of human resources was considered essential as a means of survival of Portuguese individuality in the beginning of the assertion of the Portuguese national identity. Such a fact allowed the country to be equalled to the major political powers of that time era (Florêncio, 1982). In addition, the importance of the CVET has become, at the present time, a determining factor for the competitiveness of countries, regions and companies. In fact, human resources development (HRD) plays a fundamental role to face the present "challenge of competitiveness" (Barrosa, 1991).

Continuing Vocational Education and Training can be seen as subsequent (training/learning) interventions, throughout active life, following initial education/training. It aims to improve the skills and competencies for those active in the labour market, widening knowledge of individuals and enlarging the breadth of selected activities or promoting specialisation at a specific level. In this way, CVET facilitates adults to adapt to the organisa-

tional, technical, and technological transformations of the present day. While initial training is characterised by a strong sector differentiation, CVET presents an even greater differentiation from sector to sector.

In Portugal, the access of the active population to training presents organisational and sociological constraints. For example, the legal framework that demands the previous consultation of the workers' representatives concerning training is often not followed by companies. For this reason, the low degree of workers' participation in training may have a cultural dimension, holding back the social comprehension of the usefulness of training. That problem has led to the introduction of the *individual access to training* in the revision of the European Social Fund in 1996. The revision aimed at making the access to training easier than it had been so far, appealing to the individual initiative and responsibility of both employed and unemployed workers.

Institutional interventions and experience in matters of continuing training are diversified, whether in terms of modality or in terms of responsible institutions. In the framework of the education system, recurrent education is the alternative for a second opportunity for adults who have gone beyond the age of normal attendance for primary and secondary education. As far as the *Instituto de Emprego e Formação Profissional* (I.E.F.P.) is concerned, the intervention in the sector of continuing training aims essentially to facilitate employed and unemployed workers to adapt to changes, to further their careers, in particular, and to improve the global quality of employment, in general. Still in the area of the CVET, staff training and training of managers, aiming at the acquisition or enrichment of knowledge, skills, competencies, and aptitudes should also be mentioned.

The development of the human society and its fast evolution leads to a high valuation of human resources and transforms "the concept of continuing education and training into a global project, with a common future, at a world scale, devising for Mankind education for life" (Esparteiro, 1999). In fact, in addition to "the basic professional training, workers must go on learning during the period of their professional life in order to maintain their competence. Professional training is recognised as a means to achieve such a competence" (Leitão, 1996). Therefore, participation in CVET should be considered "the centre of the theory and the practice in adult education" (Darkenwald and Merriam, 1982). In 1976, the UNESCO and the OECD ratified the "Recommendation on the Development of Adult Education", a document that was guided by three fundamental references: Autonomy, people are responsible for their own education; Totality, which, from a horizontal perspective, refers to the whole span of human life, and, from a vertical perspective, refers to the multiple areas of knowledge; and Dialectics, once it demands the integration of the educational processes of children, young people and adults, and also demands the interaction between reflection and praxis. In 1979, the UNESCO enforced new measures regarding professional training, in order to deal more effectively with the problems posed by economic, technological and social changes and development.

Understanding factors influencing participation of active adults in training is very relevant for designing and implementing strategies for organising the continuing education systems aiming to adapt training offers to training demands for the continuing qualification of professionals. This is true because understanding how and why (and why not) adults participate

in education activities facilitates setting up and implementing effective strategies to promote continuing education programmes to satisfy training needs of individuals and organisations.

Active adults' attitudes towards to continuing and systematic learning processes and factors associated to their resistance to participation in continuing education are not well known. Factors associated with adults' participation in continuing education activities are diverse in nature. According to previous research results, adults' participation in education is influenced by characteristics of a personal order and contextual nature. The personal factors are usually associated with individual's experience in social and educational processes. For instance, most of the active adults who participate in training activities are in a technical profession and/or have high social status (Brunner *et al.*, 1959). Furthermore, an individual's level of formal education appeared to be very positively associated with participation in continuing education. Although carried out in the 1950s, that study achieved results that appear to be very close to the current situation of the less developed European regions. The contextual factors are related to the characteristics of the environment and the conditions of training offers. In addition, the difference between adults' participation and non-participation appears to lie in aspects associated to age, school level, and residence (Johnstone and Riviera, 1965). For some years now the issues determining adults' non-participation in educational activities have been the focus of many authors such as Cross (1981), Darkenwald and Merriam (1982), and Darkenwald and Valentine (1985). The location of the training activities and the need to learn may also pose obstacles to an individual's participation in training activities. For instance, the more common obstacle revealed by non-participants is that they do not know where such training activities are to be held (London et al., 1963).

Adult educators have been very much interested in the phenomenon of adult participation in continuing education, mainly concerning factors that influence that participation and how this participation can be predicted (Yang et al., 1994). Although participation in continuing education have been very much studied, few conceptual models have been useful for predicting participation of adults in training activities (Yang et al., 1994). Many researchers have framed their participation studies by Fishbein and Ajzen (1975) behavioural intention model. Others have tried to link motivation with participation in training activities (Houle, 1961; Boschier, 1971; Bourgess, 1971; Morstain and Smart, 1974; Grotelueschen and Caulley, 1977). Some other researchers have based their studies on the social psychology theory (Boshier, 1973; Cross, 1981; Darkenwald and Merriam, 1982).

Still others, such as Tuijman and Fagherlind (1989), defend the existence of three key-points regarding the factors influencing participation in adult education. These are: *Sociological*, characterised by demographic variables such as age, gender, education, social roles, social position and home-background; *Psychological*, addressing personality traits, intellectual capacity and attitudinal disposition; and finally *Economic*, which plays but a little part in the research concerning the participation of adults in training activities. Nevertheless, other conceptual models propose to explain adults' participation in continuing education activities from a broader theoretical perspective instead of emphasising the association between participation and motivation or attitude. In fact, research carried out more recently has posed new questions and has opened other research perspectives for studying adult partici-

pation in training activities. For example, factors related to marketing of continuing education offers, social context of individuals, difficulties of a personal and professional order, in addition to individuals' motivation appear to influence decisions of adults to take training (van Tilbourg, 1989). Additionally, a typology for non-participants in continuing education has been developed by using a set of criteria composed by personal difficulties, lack of confidence, financing costs, and lack of interest in formal educational activities (Darkenwald and Valentine, 1990).

All the research conducted within the theme of adults' participation in education and training has followed "three main types of participation: attendance, involvement, and control. Their differentiation lies in the type of action according to which participation is defined, whether in events related to adult education or in research projects. However, the analysis of these types of participation categories must not be mutually exclusive or distinct, in the sense of creating an incompatible logic, since there are characteristics uniting them" (Bagnall, 1989). In fact, most research on the participation of adults in education activities is almost entirely based on "participating attendance". The exceptions are the studies conducted into the effects of the participant's involvement in the planning of educational programmes (Rosenblum and Darkenwald, 1983), those focused on the participants' perspectives regarding their involvement in programmes of basic education (Mezirow et al., 1975), and the ones investigating self-directed learning (Tough, 1979). Orientation of studies towards "participating attendance" is explained by it being easier and safer to move towards quantification and posterior contrasts. One can consider "participating attendance" as a dependent variable, dichotomically translated as "attendance" and "non-attendance", and one can easily relate it to descriptive variables (regarding participants), the purpose being participation.

The existence of case studies based on the characteristics of participants has been underlined by Darkenwald and Merriam (1982). Other studies focused on the content of programmes (Bunnion, 1986), on their location (Johnstone and Riviera, 1965), on the obstacles to general participation (Scanlan and Darkenwald, 1984) and on the motivations leading to participation (Boshier, 1971). Houle (1961) was also guided by "participating attendance" when he developed his exploratory study of adults' motivational orientations regarding continuing education. Similarly, studies on educational needs (ACACE 1982; Fisher, 1986) and on the effects of the results of participation (Cookson, 1978; Darkenwald and Valentine, 1985; West *et al.*, 1986) addressed participation only from the point of view of "participating attendance", either individually or with related changes. The tendency to study adult participation in training centred on participating attendance "*must be reduced, since it singly does not encompass all the inherent aspects, whether to individuals or to planning*" (Bagnall, 1989). In addition, "*it is necessary to pay more attention to "involvement" and "participating control", so as to develop programmes which enable the satisfaction of individual, social, political and cultural needs.*" (Bagnall, 1989).

Adults' participation in training activities has been, more systematically, studied by Peter Cookson (USA) in a frame of the ISSTAL (*Interdisciplinary, Sequential-Specificity, Time-Allocation, Lifespan*) model of social participation developed by Smith (Smith & Macaulay, 1980). This social participation model appears to offer a good conceptual framework for

studying factors associated with active adults' participation in training activities (Cookson, 1986). It is the only model associating and interconnecting all the factors closely linked to the question of adult participation. The ISSTAL model brings in three characteristics of particular importance for researching adult participation in continuing education. First, it offers an interdisciplinary research frame. Second, it introduces a chronological perspective of relationships among factors of diverse order and between them and participation. Third, it gives a perspective of time distribution across an individual's life. That is to say that human behaviour may be predicted and foreseen after the analysis of individual and environmental aspects, which may be identifiable and measurable. For those reasons, the ISSTAL model appeared to constitute an interesting and adequate research frame to study and understand active adults' participation in continuing education and training activities in the European regions, being of particular relevance for studying participation in the Alentejo and Lisboa & Vale do Tejo regions (of Portugal). The model postulates individual and discretionary adult behaviour resulting from a complex interaction among a set of predictive (independent) variables organised into six sets (Cookson, 1986): (1) External context, (2) social background, (3) personality, (4) attitudinal dispositions, (5) retained information, and (6) situational aspects (see Figure 1). However, the study has also taken into consideration other aspects, such as the learning organisation and the organisational culture concepts, participation in organisation and knowledge as power in the workplace, the professional identity and the social and work values.

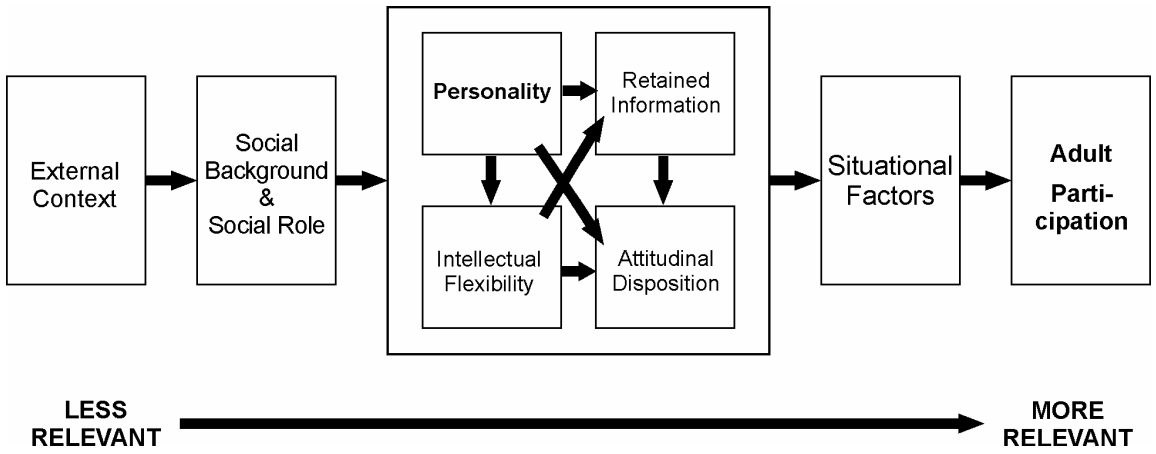


*Fig. 1 Model of adult participation in continuing education*
*Note: Adapted by Cookson (1986) from Smith's ISSTAL model (1980)*

The variables adapted from Smith and Cookson for inclusion in the study, and indicated in Figure 1, are outlined as follows.

External Context may be defined as a group of independent variables referring to the individual's external environment, which form "…an internal matrix in which social background, personality and attitude characteristics of individuals originate, develop and modify. In fact, internal individual characteristics derive their essence from social expectations, rules, structures, cultural models, human population and variables of the biophysical environment comprehended in the category of contextual characteristics." (Smith and Reddy (1972), cited by Gonçalves, 1996: 67).

*Social Background and Social Roles* find correspondence in five types of the individuals' socio-demographic characteristics: (1) physical and physiological aspects, (2) attributed social positions and their roles, (3) acquired social positions and their roles, (4) experience and activities, and (5) resources and access to resources. Together these components provide the constitution of behaviour models and experience leading to distinct perceptions of the knowledge of the world.

*Personality and Intellectual Flexibility* constitutes the third class of independent variables. Personality is a group of inherent mental characteristics which, despite the fact that they may undergo some changes, tend to resist circumstantial and temporal shifts. "These characteristics encompass the individual dispositions of permanent character, such as thinking, feeling, wanting and acting in a certain way, to the disregard of other attitudes, depending on circumstances." (Gonçalves, 1996: 68). Personality is constituted by important factors that are associated with different modes of social participation, such as extroversion, ego, inner strength, self-confidence, efficiency degree, energetic performance and stimulation. Intellectual Flexibility includes dimensions concerned with intellectual capacities of individuals.

*Attitudinal Dispositions* encompass internal psychological characteristics, transactional and lasting for less time when compared to personality and intellectual capacity. In encompassing values, attitudes, expectations and intentions, these variables are involved in a dynamic interaction with personality characteristics and intellectual capacity, thereby contributing to the individual's motivation.

*Retained Information* refers to the individual's 'continuous life', enabling a significant increase in secure and lasting information, stored in the memory in the form of symbolic and non-symbolic images. The purpose of these variables is to store and recover information, contrasting with the variables of the first two classes, which process and interpret information. The variables integrated in this class are images, beliefs, knowledge and plans.

*Situational Variables* are the factors and aspects which lie closer to voluntary human behaviour, which are those aspects that wield the most immediate effects on Participation in Adult Education. This set of variables leads to complex and interactive effects on all the other sets of prior and lasting variables of the ISSTAL model that influence an individual's participation in Adult Education.

Besides aggregating all the variables previously described, this model includes three fundamental aspects. First, an *Interdisciplinary Conceptual Framework***,** a perspective which includes concepts and interrelations articulated in the domains of Physiology, Anthropology, Political Science, Sociology, Social Psychology and Adult Education, contradicting the previously integrated idea that the domain of Psychology held the monopoly of definitions for this area. Second, it has a *Sequential Specificity of Relations***,** whereby the six classes of independent variables contained in this model are causally interrelated. With the exception of situational variables, all of them influence the dependent variable Participation in Adult Education (PAE) through one or more of the intervening variables. Therefore, the more to the left a variable is placed the lower it appears on the relevance scale, the higher will be the probability of the effect of the variable being mediated by subsequent and consequent variables. In contrast, the more to the right a variable is placed on the reference scale, the more spe-

cific is its role and situation in explaining PAE. Third the model utilises a *Time-Allocation, Life-Span Perspective***,** that is, PAE is understood as an enlarged part of the model of behaviour of social participation. This means it is seen as a demonstration of synchronic and diachronic co-variations, meaning that it is not only individual participation that has implications on other kinds of social activity. The 'Life-Span' aspect postulates that social participation (including PAE) tends to be suited in long-lasting models, in order to enable diachronic co-variation. Consequently, a person who, at thirty years of age, has reached a high degree of Participation in Adult Education is not likely to have diminished such participation when he or she reaches fifty or sixty. The reverse is equally important: a person who has had a low degree of Participation in Adult Education from a very young age is likely not to alter his or her degree of participation in the course of time.

## *4.4 Study Objectives*

This research aimed to study and understand one of the key mechanisms for social integration: *technical workers' participation in continuing vocational education and training*. Knowing and understanding the factors which influence technical workers' participation in CVET will allow developing and implementing adequate and effective strategies for increasing technical workers' employability which is a relevant characteristic to combat social exclusion.

Studies about adult participation in continuing education activities are sparse in Portugal. Adult educators rarely have the time to study learning conditions and behaviours of the adult participants in their training programmes. In addition, studies on mechanisms that regulate attitudes of active adults towards continuing learning have not been conducted. Factors influencing passivity and reluctance of active adults to attend training are also unknown. This situation poses difficulties to formulating and implementing effective continuing education programmes in Portugal, in general, and in Alentejo and in Lisboa & Vale do Tejo, in particular.

Knowledge about conditions and factors that influence adult participation in learning activities must be improved in Alentejo and in Lisboa & vale do Tejo if effective continuing education policies are to be developed in those regions. On the one hand, participation in continuing qualification of active adults contributes for preventing an individual's social exclusion and also increases an individual's employability. On the other hand, promoting participation in continuing training of the unemployed people, namely those who are less qualified, facilitates combating exclusion of the less favoured. Furthermore, continuing qualification of the human resources is essential to increase business effectiveness since it depends firstly on effective and efficient use of new knowledge and technologies.

The present study intended to identify, analyse, and understand factors and relationships associated to technical workers' participation in continuing vocational education and training (CVET) activities in the Alentejo and in Lisboa & Vale do Tejo regions. In this research, technical workers are defined as the workers who perform technical and technological tasks in the different industrial sectors. It is assumed that the technical function performed by those workers gives them a fundamental role in their company's functioning structure. Understanding how and why (or why not) technical workers participate in continuing training offerings will contribute to designing and setting up effective continuing vocational training

programmes and strategies. In addition, the present research is intended to assess technical workers' attitudes towards participation in continuing vocational training activities, particularly in relation to information technology. In consequence, the study aimed to contribute tp establishing policies and strategies to promote and increase the level of technical workers' participation in their own professional qualification.

More specifically, this study intended to achieve the following objectives:

- To identify and analyse factors and relationships associated with the participation of technical workers in continuing VET offerings and to understand how those factors influence their decision to participate in these activities.
- To assess and characterise technical workers' attitudes toward participation in continuing VET programmes.
- To contribute to designing and implementing continuing VET policies and strategies for promoting and increasing participation of workers in continuing VET programmes.
- To contribute to a better understanding of the life-long learning in designing and implementing strategies for increasing the ability to sustain employment / self-employment.
- To contribute to designing human resources development (HRD) policies and strategies for promoting and increasing business competitiveness.
- To develop a model of participation in continuing VET to enable policy makers and practitioners to understand and implement the best approaches for making workers, managers and employers to embark on continuing VET.

## *4.5 Study Contexts*

### 4.5.1 The Agricultural-food sector in Alentejo region

"The classification of the processed food industry incorporates all the activities that are related to the transformation of raw-materials, of animal, vegetal or mineral origin, destined for food. The manufacture of composite animal feed is included in this industry, according to the above mentioned classification and the Portuguese Classification of Economic Activities (CEA – Rev. 2)" (INOFOR, 2001:9). Currently the European Union is the world's main producer of food products, having surpassed the United States during the first half of the 1990s. Between 1985 and 1995, the production and consumption of food products in the European Union increased over 50%, and during the same period exports increased by 45%. In the context of the European Union, the trade in processed food products is mainly within the Community, representing, in 1996, 65% of the total imports and 72% of the total exports. In terms of trade with non-community members, the export of processed food products represents 7.4% of the total exports and 9.6% of the imports.

Presently the production of the Portuguese processed food industry does not cover the food requirements of the population. For this reason, Portugal imports, both from within and outside the European Union, about 71,5% of its needs in terms of processed food products. The opening of markets to international trade has been coupled with the growing dynamism of the market, the increase in the demand for products with greater added value and the change in the life styles favouring the convenience of products. These changes have made the Portuguese market increasingly attractive for foreign food-processing companies,

through the direct placement of their products or the installation of these companies in Portugal (INOFOR, 2001)

Portuguese processed food production is similar to what occurs in European Union countries in general, and is mainly aimed at the national market, PALOPs (African countries with Portuguese as the official language) and the countries where there are Portuguese communities**.** In addition to pressure from external competition, the Portuguese food-processing industry is subject to a very competitive distribution market, which uses strong advertising campaigns, discounts, reduced prices and other sales programmes, providing the consumer with a large variety of foodstuffs, leading to strong competition between Portuguese and foreign industries. The processed food industry is an important sector in terms of employment, being surpassed only by the clothing industry in the manufacturing sector. This situation has occurred through market changes due to changes in consumers' habits and other changes such as the increase of the number of women working outside the home and the increase in families' purchasing power.

In day-to-day terms, the food-processing industry holds a fundamental place in the Portuguese economy. However, its importance is not derived only from its economic weight, but also from the sensitivity of the product, since it produces the required goods for survival. The concept of quality has been assuming a fundamental role in the food-processing industries in Portugal. A change in the attitude of the consumers is noticeable, especially, in the large urban centres. Consumers are increasingly more demanding in terms of questions related to the hygiene surrounding food products and the safety of the products. Thus, there are increasing numbers of consumers willing to pay higher prices for products with a seal guaranteeing quality. In summary, the food-processing companies have the great challenge of improving the systems of food safety and encouraging communication with the consumers, in order to win their confidence in the systems used for the quality control of the products (INOFOR, 2001).

Alentejo is among the 25 poorest regions of the European Union, in terms of GDP (Gross Domestic Product ) *per capita*. Among the five NUTs of the continent, the Alentejo region is the one furthest from the national average GDP *per capita*. With the largest part of Alentejo´s land area devoted to agriculture, the primary sector holds a relatively greater importance in the region than in the GAV (Gross Added Value) of Portugal. It is the region where the secondary sector appears less dynamic. The fragility of agriculture from an economic point of view is well expressed by the great dependence of the regional agricultural incomes on the direct assistance to production currently practised. Agriculture and rural areas of Alentejo are facing profound changes, which call for new attitudes and solutions on behalf of society, especially the farmers, as well as at the level of public policies. The diagnosis makes it possible to identify a group of dynamics and consequences and understand the large elements that will shape its future evolution.

The sector is still significant when one takes into account the combined value of agriculture, forestry, food-processing and wood industries (with a 15.1% contribution to regional GAV, compared to 3.9% of the total contribution of the agricultural sector to the national GAV). However, the relative loss of its autonomy and social and economic importance is evident, and this has occurred because of the downstream displacement of the centre of

gravity of the value chains of agricultural and forestry products. In addition, the operating rules resulting from the inclusion of the sector in a context of open markets, the progressive liberalisation of policies and the impact of changes in technology and consumption patterns, have brought about changes in the competitive framework. These in turn have led to the need for adjustment in the activities of food-processing companies. In this context, the recognition of the multifunctional character of agriculture, the changes that are introduced into it through the dominant dynamics and the consequent need to reconstruct the relationship between agricultural development and rural areas, considered as opportunity areas, acquire importance in the policy making process.

The food-processing sector includes the slaughtering of live-stock; the preparation and conservation of meat and meat based products; the fish processing industry and aquaculture; the conservation of fruits and horticultural products; the production of oils and animal and vegetable fats; the dairy products industry; the processing of cereals and legumes; the production of starch, dehydrated potatoes and similar products; the production of composite feed for animals and the production of other feed products. The size of farms and the weak business dynamic are two aspects that definitely cannot be left out of consideration in a process that requires the adoption of profound and complex changes which originate from other weaknesses that characterise the region's farms. At the same time, the productive agricultural structure depends, largely, on dry land farming and extensive cattle breeding, so this sector is particularly sensitive to the influence of external factors, namely those that result from the CAP (Common Agricultural Policy) and the liberalisation of the market.

The re-conversion of the agriculture of Alentejo is the re-conversion of the wheat-based cereal system, which is only possible in the medium/long term, with strong support from applied research/experimentation and with the introduction of irrigation. However, regional farms seem to have room for improvement in achieving significant increases in productivity, through the adoption of a diversified set of productive and technological transformations, namely the introduction of new olive groves, extensive technologies in dry cereals and cattle breeding, new areas of vineyard and new irrigation districts. The contribution that such potential productivity gains could have on decreasing the predicted negative effect on the income of regional agricultural farms will greatly depend on the results of modernisation and expansion of irrigation in the region, and in which the Alqueva Multipurpose Enterprise is a decisive factor. Also the incipient farmers' organisations, which function at the level of production, supply concentration, and transformation and commercialisation of regional products, have to be invigorated and strengthened in order to achieve the necessary market size.

### 4.5.2 Information and Communication Technologies (ICT) sector[15]

The evolution of employment, qualifications and skills in the Information and Communications Technologies industry has, in recent years, become the focus of ever-increasing attention and research, reflecting and proportional to the now major role ICT plays in today's society. The myriad of technological developments that has evolved over the past few decades is the basis of the influence that the industry and its technologies have gained transversely in the world's economies.

At the dawn of the 21st Century, the global economy is confronted with profound changes. One such change is internationalisation that, while offering opportunities to small countries, is not completely free of disadvantages. The time lapse between upgrades in equipment narrows increasingly; dependence on technological advances becomes greater, and the short lifespan of products leaves economies exposed and highly vulnerable to factors beyond their control. The increasingly pivotal role of information systems in the globalisation of markets, the international aspects of IT that focus on practices and opportunities, and the cultural and social comparative assessments connected with their usage and exploitation, have propelled information and knowledge to the very centre of world attention. The old hierarchical order of countries has been reversed, with Japan unquestionably on the ascent, in contrast with the apparent decline of the US, and European stagnation. In this scenario, latecomer small countries missed their chance to join the frontrunners in the technical field. But, as barriers around knowledge collapse and it becomes more mobile, they now have an opportunity to appropriate knowledge. They can now minimise their disadvantage by acquiring just the benefits of technological progress, and, by so doing, reach a good solution. Economic globalisation and internationalisation are, therefore, associated with a series of transformations that configure transition to a new techno-economic paradigm. This new technological and productive paradigm is intensely ICT focused, and this gives rise to a new set of working principles in world economy, engenders impetus to new waves of innovation, and to new spaces for transaction, communication, information and entertainment.

With the development of ICT, new specialised production activities have emerged that tend to be grouped in the same geographical space. The activities seek more lucrative locations, recreate the locality and intensify competition in the region. These new local/regional strategies have been given the name of 'globalisation' – a concept that illustrates the idea that globalisation and innovation are processes accompanied by the increase in value of the space and by strategies whose aim is local development. In this new context of economic and technological progress, geographical proximity emerges as a predominant factor and a

[15] This section was developed based on the study undertaken by the Centro de Estudos Aplicados (CEA) of the Universidade Católica Portuguesa, for the ANETIE (Associação Nacional das Empresas de Tecnologias de Informação e Electrónica – National Association of IT & Electronics Enterprises). That study has used secondary sources on Portugal's IT market, such as: INSAT's June 2000 Revista Visão Global, Mentor IT, IDC (International Data Corporation) 2000 and EITO(European Information Technology Observatory) 2000.

facilitator in the exchange of tacit knowledge. Increasingly, local spaces come to be regarded as cognitive spaces. The global spatial hierarchy is, thus, determined by a local capacity to absorb new technologies and by the availability of infrastructures and labour that match the requirements of knowledge-intensive economic segments. Regions that invest in innovation and training gain a new lease of life and higher status, while regions that do not keep up in this way are liable to suffer a process of spatial disintegration, restructuring or reconstruction. So, in spite of the advent of the Internet, software, and data processing services, i.e. the growth of the global village, geographical location continues to play a decisive role, which has given rise to hubs of innovation and development emerging in different parts of the world and throughout Europe.

Before attempting to quantify the ICT sector market, the boundaries that separate it from other adjacent markets have to be clearly demarcated. There is neither a unanimous agreement nor sufficient clear definition of what the ICT sector is. This is partly due to the breakneck pace of technological innovation, which causes sectoral borders to constantly shift. On one hand, computerisation and digitalisation of the economy and the advent of the Internet are just two of the factors that have accelerated the blending together of sectors that, in the past, were separate. On the other hand, the ICT sector has proven to be fertile terrain for new jobs and skills, and to have a labour market that works in its own special way.

From the microeconomic standpoint, the market's borders should be properly demarcated, taking into account the need for a degree of flexibility in the search for potential substitutes for various products. Setting these demarcation lines, however, is no easy task. A market is often defined on the basis of consumer group identification, their needs, and the technological process through which their needs are satisfied. According to the Revista INSAT, information technologies are considered *the products and services for the processing, storage and communication of data using computers. Included are hardware, systems software, applications, training, consultancy and related services; not included are products and services strictly linked to telecommunications* (INSAT, 10). According to the EITO, the term information technology refers to *the combination of hardware industries for office equipment, data processing equipment and data communication, software and services equipment* (EITO, 40). These definitions are based on two different approaches. While the first is based on a notion of product and service, the second is based on a notion of industry.

Although there is some diversity in the definitions relating to the segmentation of the IT market, with regard to the segmentation by product, there is a certain pattern that can be summarised in the following categories: (1) Hardware; (2) Software; (3) Services. On the basis of this typology, the segmentation by products suggested by the different sources can be presented in Table 1, while the profile of the Portuguese IT market can be represented in Table 2 and Figure 2:

| | EITO | IDC | INSAT | Mentor IT |
|---|---|---|---|---|
| **Hardware** | • Computer and data communication hardware<br>• Office equipment | • Data communication<br>• Individual users<br>• Multi-purpose | • Servers<br>• PCs<br>• Other hardware | |
| **Software** | • Software | • Software packages | • Software and services | • Systems software<br>• Application software |
| **Services** | • Services<br>• Support services | • Support services<br>• Professional services | | • Consultancy<br>• Implementation<br>• Operations management<br>• Support services |

*Tab. 1 ICT market segmentation by products*
*Note: INSAT does not separate software from services*

| Source | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|
| EITO | 1279 | 1434 | 1607 | 1774 | 1959 | 2165 |
| IDC | 1275 | 1455 | 1631 | 1809 | 1960 | 2114 |
| INSAT | 1172 | 1312 | 1471 | | | |
| Mentor IT | 1371 | 1501 | 1651 | 1819 | 2005 | 2210 |
| Difference (Max-Min) | 199 | 189 | 180 | 45 | 46 | 96 |
| Difference (average) | 15.62% | 13.26% | 11.32% | 2.50% | 2.33% | 4.44% |

*Tab. 2 Portugal's ICT Market (Mio. €)*

As can be seen from Figure 2, forecasts provided by the IDC, EITO and Mentor IT are very similar, while INSAT's predictions are somewhat lower. As there are only slight variations between the different sources' figures, and the relative positions do not change, the respective growth rates are also very similar. The market's average annual growth rate, in the period in question, is at least 10% (see Table 3).

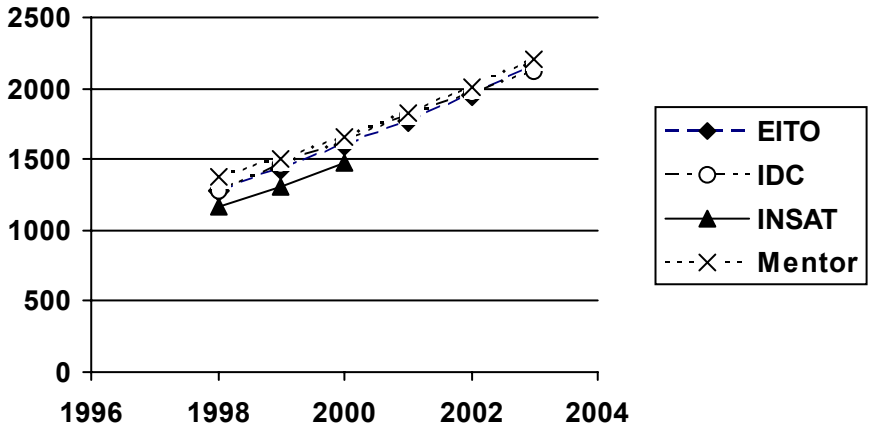


*Fig. 2 Portuguese ICT Market*

| Source | Annual growth rate | | | | | |
|---|---|---|---|---|---|---|
| | 1999 | 2000 | 2001 | 2002 | 2003 | Average |
| EITO | 12.1% | 12.1% | 10.4% | 10.5% | 10.5% | 11.1% |
| IDC | 14.1% | 12.1% | 10.9% | 8.4% | 7.9% | 10.6% |
| INSAT | 11.9% | 12.2% | | | | |
| Mentor IT | 9.5% | 10.0% | 10.2% | 10.2% | 10.2% | 10.0% |

*Tab. 3 Portuguese IT market growth*

The Portuguese IT market segmented by products is represented in tables 4-7 and Figure 3.

| | Year | EITO | IDC | INSAT | Mentor IT |
|---|---|---|---|---|---|
| Hardware | 1998 | 743.2 | 748.2 | 608.5 | 832.9 |
| | 1999 | 842.9 | 872.9 | 653.4 | 907.8 |
| | 2000 | 957.6 | 997.6 | 748.2 | 1002.5 |
| | 2001 | 1067.4 | 1127.3 | | 1097.4 |
| | 2002 | 1177.2 | 1217.1 | | 1207.1 |
| | 2003 | 1301.9 | 1301.9 | | 1321.8 |

*Tab. 4 Hardware market segment value (Mio. €)*

| | Year | EITO | IDC | INSAT | Mentor IT |
|---|---|---|---|---|---|
| Software | 1998 | 174.6 | 164.6 | 563.6 | 174.6 |
| | 1999 | 194.5 | 189.5 | 668.4 | 194.5 |
| | 2000 | 224.5 | 214.5 | 723.3 | 224.5 |
| | 2001 | 254.4 | 239.4 | | 254.4 |
| | 2002 | 284.3 | 269.4 | | 289.3 |
| | 2003 | 314.2 | 309.3 | | 329.2 |

*Tab. 5 Software market segment value (Mio. €)*

| | Year | EITO | IDC | INSAT | Mentor IT |
|---|---|---|---|---|---|
| Services | 1998 | 364.1 | 559.1 | | 364.1 |
| | 1999 | 394 | 389 | | 399 |
| | 2000 | 423.9 | 418.9 | | 423.9 |
| | 2001 | 453.9 | 438.9 | | 463.8 |
| | 2002 | 498.7 | 468.8 | | 508.7 |
| | 2003 | 553.6 | 508.7 | | 558.6 |

*Tab. 6 Services market segment value (Mio €)*

| | EITO | IDC | INSAT | Mentor IT |
|---|---|---|---|---|
| Hardware | 11.9% | 11.7% | 10.9% | 9.7% |
| Software | 12.5% | 13.4% | 13.3% | 13.5% |
| Services | 8.7% | 7.2% | | 8.9% |

*Tab. 7 Average annual Segment growth rate by Product (1998 – 2003)*

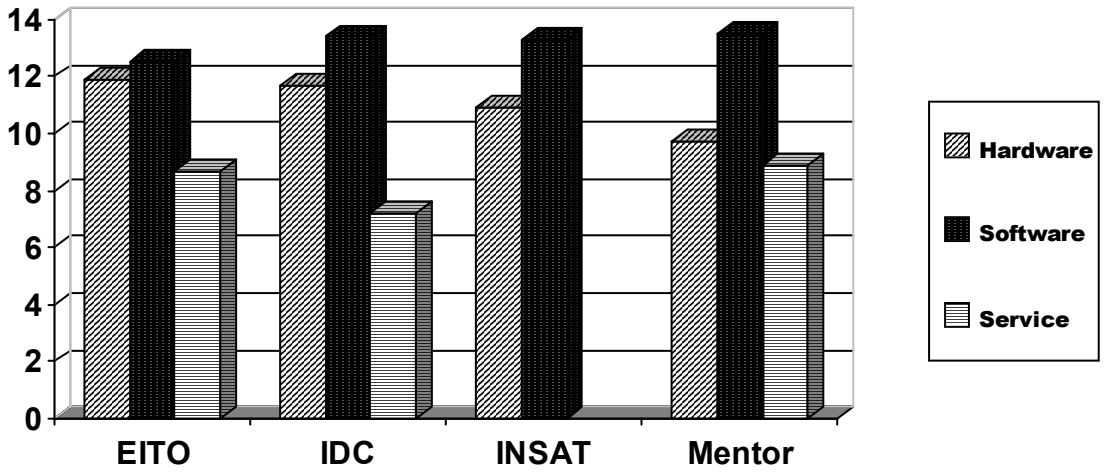


*Fig. 3 Average annual Segment growth rate by product (%)*

As can be observed from the above tables and graph, the Hardware segment is most prominent with the largest market value. Its growth rate, however, is higher than that of the Software segment, but lower than that of Services. According to the EITO and IDC, the forecast growth of the Software and Services segments combined is less than that of Hardware, for the period under review. The EITO's forecast for these two segments' average annual growth is 10%, while the IDC's estimate is 9.3%. Mentor IT predicts that these two segments will grow at a rate of 10.5%, i.e. at a higher rate than it forecasts for the Hardware segment (9.7%). Software is regarded by all the sources as the segment likely to have the fastest growth. However, while the IDC and Mentor forecast practically the same annual average growth rates (13.4% and 13.5% respectively), the EITO predicts a rate of 12.5% or less for Software. Services is regarded (by all sources) as the second largest segment after Hardware. It is, however, the market segment for which the lowest annual growth rate is forecast. Both the EITO and Mentor IT forecast approximately 8% growth for the sector, while the IDC puts growth at 7.2%. According to INSAT's figures, the Hardware segment has been losing ground in relation to Software and Services.

According to the Centro de Estudos Aplicados of the Universidade Católica Portuguesa, for ANETIE (National Association of IT & Electronics Enterprises), the Services market may be divided into the following five segments:

– Consultancy (Strategy & Architecture);
– Operations and Implementation Management;
– Training;
– Support Services;
– E-Business Services.

With regard to the *Consultancy (Strategy & Architecture)* sector, activities include:

– Corporate strategy consultancy;
– Business process improvement;

– Capacity planning:
– Best practices;
– Re-engineering processes;
– Change management services;
– Information systems strategic support;
– Architecture planning and choice of suppliers consultancy;
– Products consultancy;
– IT Technical design
– Maintenance planning.

Concerning *Operations and Implementation and Management* segment, activities are directly involved with the creation of IT solutions, i.e.:

– Search;
– Configuration;
– Installation;
– Development;
– IT testing and management;
– Development of customised applications and/or application adaptation.

Operations management presupposes, therefore, responsibility for the management of the components of a specific client's IT infrastructure. So, activities include:

– Help-desk services;
– Management of assets;
– Systems management;
– Networks management;
– Software updating;
– Installations management;
– Backup and archive;
– Recovery and processing.

The *Training* segment constitutes a vitally important business sector in any IT strategy since, without suitable training, investment in IT will not produce optimum rewards. Without the necessary skills with which to use and exploit new technologies, a sector's development and productivity will be doomed to failure. *Support services* can be integrated within a vast range of services or, alternatively, may be commercialised individually, and include provision of maintenance contracts and telephone help services.

In the realm of *E-business Services*, the segment is divided into two sub-groups: Business-to-Business (B2B) and Business-to-Consumer (B2C). Each sub-group has its own characteristics and specificities, and its own set of requirements and needs. Direct services associated with e-business projects are incorporated in each segment, as well as outsourcing. Services included in B2B E-business and B2C E-business are:

– Web design;
– Content set up and management – Publishing;

– Interactive services;
– Web Hosting/Housing.

The following Table shows the Services market's recent performance and forecasts (for 2001 –2003) by segment.

| Group | Segment | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|
| Services | Consultancy (Strategy & Architecture) | 33.7 | 37.7 | 41.6 | 46.5 | 51.9 | 57.9 |
| | Operations Implementation and Management | 197.6 | 240 | 286.5 | 340.6 | 400.9 | 478 |
| | Training | 20.1 | 21.9 | 23.4 | 25.6 | 28.1 | 30.8 |
| | Support Services | 82.3 | 91.2 | 103.6 | 116 | 129.1 | 143.7 |
| | E-business Services | 4.6 | 6.2 | 8.1 | 10.4 | 14.4 | 15.2 |
| | B2B E-business | 1.8 | 2.1 | 2.6 | 3.2 | 4 | 5 |
| | B2C E-business | 2.8 | 4.1 | 5.4 | 7.2 | 10.5 | 14.7 |
| | Sub-total for Services | 342.9 | 403.2 | 471.2 | 543.5 | 638.9 | 745 |

*Tab. 8 Size of the IT Services market by Segment (Mio. €)*

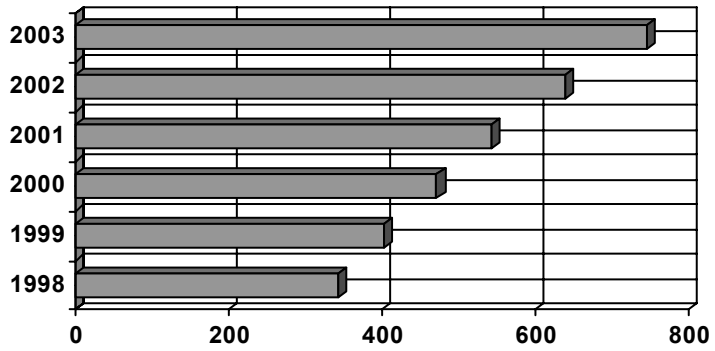


*Fig. 4 Services market total (Mio. €)*

From the above table and graph it can be seen that in the period 1998 to 2000 the services group grew by around 37% (rising from €342.9 Mio. to €471.2). For the period 2001 to 2003, estimated growth is 57.6% (an increase of €273.8 million). The market's average growth, which was relatively stable, was between 16 and 18%. With regard to segmentation of the Services Market, the Operations Implementation and Management segment is clearly way in the lead, with 58.4% of the total market in 1998, increasing to 65% in 2003, and with average annual growth rates of around 19%. The Vocational Training segment grew by around 10%. E-business Services was the fastest growing segment, with rates exceeding 30% and still accelerating in the period under review. Nonetheless, the E-business Services segment still carries relatively little weight in the market as a whole (and is not expected to exceed 2% by 2003).

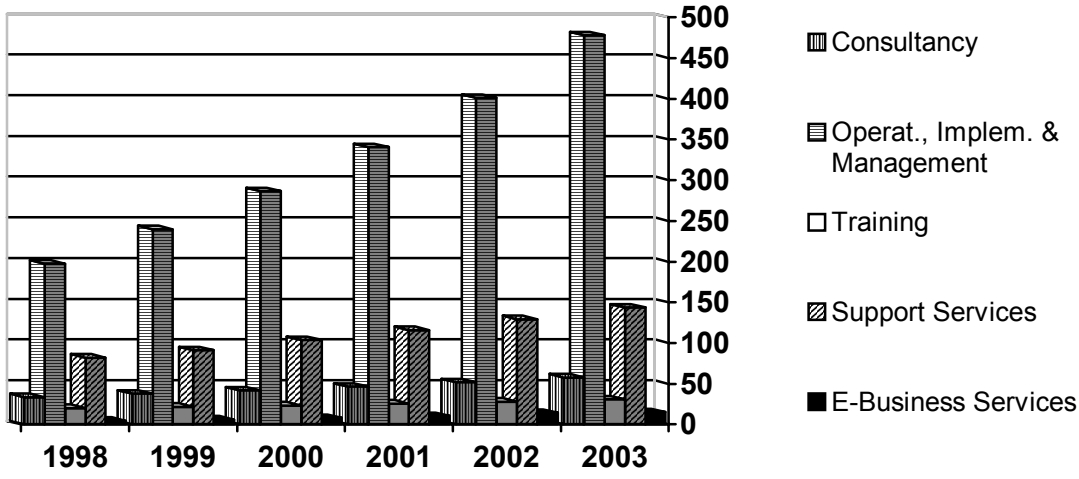


*Fig. 5 Segmentation of the Services Market (mio. €)*

### 4.5.3 Research design and procedures

This research has studied adult participation in continuing education and training. It was essentially designed to identify and analyse the factors associated with technical workers' participation in continuing VET activities and to understand how they influence technical workers' decisions to participate in these activities. For this reason, participation in continuing VET activities was selected as the criterion (dependent) variable. The predictive (independent) variables were the factors assumed to be associated to technical workers' participation in continuing VET offerings (see Tab. 9).

| Classes | Variables |
|---|---|
| Social background & social roles | Ascribed social roles<br>Achieved Social roles<br>Experience & activities<br>Resources & resource access |
| Personality & intellectual flexibility | Psychological functioning<br>Beliefs & values<br>Intellectual activities |
| Attitudinal dispositions towards | Learning & education<br>Profession & job<br>Training entities<br>Training activities |
| Retained information | Level of participation in training<br>Satisfaction with training<br>Satisfaction with schooling<br>Self-perception as student |
| Situational factors | Marketing of training<br>Participation barriers<br>Job characteristics |
| Criterion variable | Participation in continuing education |

*Tab. 9 The ISSTAL model: List of variables*

The study has been theoretical framed by the ISSTAL model of social participation and has used a *cross sectional survey* approach which will be complemented by a set of case studies to further understanding of the factors influencing participation in CVET. In the survey phase, data was collected through an instrument specifically developed for the study from two samples drawn from two populations. The first was all technical workers employed by small and medium companies (SMEs) of the agricultural-food sector located in the Alentejo region. The second was all technical workers employed by SMEs of the ICT sector located in the Lisboa & Vale do Tejo region (see Tab.10).

| Sub-regions | Agricultural-food (Alentejo) | ICT (Lx & VT) |
|---|---|---|
| Alto Alentejo | 120 | 128 |
| Alentejo Central | 122 | |
| Baixo Alentejo | 104 | |
| Alentejo Litoral | 110 | |
| Total | 456 | 128 |

*Tab. 10 Samples*

The predictive factors (independent variables) of the participation in continuing education (criterion variable) were framed by six classes (Cookson, 1986):

Class 1 - External context
Class 2 - Social background and social roles
Class 3 - Personality and intellectual flexibility
Class 4 - Attitudinal dispositions
Class 5 - Retained information
Class 6 - Situational factors

The *External context* is related to characteristics of the local where continuing education is taking place. This variable has not been taken into consideration for the present phase of the study. The *Social background & social roles* concern individuals' ascribed and achieved social roles, life and professional experience and activities, and resource availability and access to resources. *Personality and intellectual flexibility* includes factors of psychological functioning, personality characteristics, and intellectual capacities of individuals. *Attitudinal dispositions* frames factors concerning individual's values, attitudes, expectations and intentions. *Retained information* includes variables related to individuals' learning orientation, beliefs, and knowledge they have about learning. The *situational factors* are related to temporary situations and aspects that may be associated to participation in learning activities.

In the present research, *adult participation in continuing education***,** the criterion variable, is defined as the technical workers' involvement in purposive and deliberate learning through continuing education and training programmes.

The instrument, based on another previously developed by the author, was elaborated taking into consideration the ISSTAL model. It was organised into five parts:

- **Social background & social roles** was composed of five groups of indicators: a) Ascribed social roles, b) Achieved social roles, c) Experience & activities, d) Physical deficiencies, and d) Resources and resource access;
- **Personality and intellectual flexibility** was subdivided into three scales: a) Psychological functioning, b) Beliefs and values, and c) Intellectual activities;
- **Attitudinal dispositions** included items collecting three types of attitudes toward: a) Learning and education, b) Profession and job, and c) Training conditions;
- **Retained information** was organised into two aspects: a) Level of participation in training activities, b) Satisfaction in relation to experienced training activities; and
- **Situational factors** comprised three aspects: a) Marketing of training activities, b) Awareness of limitations and barriers, and c) Awareness of professional factors. Most of the variables were measured by scales of multi 5-point Likert-type items developed along the domain of each construct.

The instrument was pre-tested and evaluated in terms of validity and reliability. Validity was estimated by two ways: (1) Content validity (Multi-item scale and instrument) through a panel of judges (experts), and (2) Discriminant validity through Spearman correlation (Table 11). Results suggest that all of the multi-item scales have discriminant validity. The Instrument and scale reliability was examined by the Cronbach's alpha coefficient based on the data from the pre-test conducted with 25 technical workers who were not a part of the sample (Table 12). Alpha coefficients for all scales are above or near to the 0.70 cut off recommended by Nunnally (1978).

| Scales | Personality | Attitude | R. Information | Situational |
|---|---|---|---|---|
| Personality | 1.0000 | | | |
| Attitude | 0.2134 | 1.0000 | | |
| R. Information | 0.1573 | 0.2471 | 1.0000 | |
| Situational | - 0.1037 | 0.0256 | - 0.0376 | 1.0000 |

*Tab. 11 Discriminant Validity of Multi-item Scales*

| Scales | Alpha Pre-Test | Alpha Final |
|---|---|---|
| Personality and Intellectual Flexibility | 0.7983 | 0.8223 |
| Attitudinal Disposition | 0.7371 | 0.8917 |
| Retained Information | 0.6820 | 0.7625 |
| Situational Factors | 0.6752 | 0.7587 |

*Tab. 12 Scale Reliability*

In the case study phase, data will be collected by semi-structured interviews and non-participant observation from one case selected from each region according to specific criteria established by the research partners.

Data analysis for this survey research has comprised three phases. Firstly, each class dimension was submitted to *principal (categorical & non-categorical) component factorial analysis* to identify factors influencing technical workers' participation in continuing education activities. Secondly, relationships between the different assumed predictive factors and the criterion

(dependent) variable (participation) were estimated by *categorical multiple regression analysis* framed by a *path analysis strategy*. All statistical analyses were performed at 0.05 level of significance.

### 4.5.4 Analysis and discussion of results

In general, findings from statistical analyses (factorial analysis and multiple regression) appear to indicate that the ISSTAL model, with some adjustments, applies to the agricultural-food (Alentejo) and ICT (Lisboa & Vale do Tejo) realities. Nevertheless, some minor differences appear to be present in the dimensions integrated in each class of factors. For this reason, it can be said that the ISSTAL model appears to be a useful theoretical frame for understanding how and why technical workers from the agricultural-food sector in the Alentejo and from the ICT sector in Lisboa & Vale do Tejo participate (or not) in continuing training offerings.

**The Agricultural-food Sector of Alentejo**

***Characteristics of the Target Group***

The sample of agricultural-food technicians in the Alentejo region is characterised by being a population where there is broad gender equality: men (47.1%) and women (52.9%). In addition, there is not a significant difference between men and women in terms of participation in CVET. That means that participation in CVET is not influenced by gender. The majority of the technicians are aged between 25 and 54, and the 35-44 age cohort comprises the largest group. Although significant at 0.01 level, the value of the Sommers' d measure of association (0.106) between age and participation indicates that age does not strongly and directly influence participation in CVET.

More than 80% of the agricultural-food technicians working in the Alentejo companies have lived until 18 years old in small and medium sized villages. This probably indicates that the majority of the technicians working in the Alentejo's agricultural-food companies come from the rural areas of the Alentejo region. According to Somers' d measure of association, that fact does not have a significant influence in participation of agricultural-food technicians in CVET. The majority of technicians are married (79.1 %) and have less than 2 children (90.8%). According to Phi and Cramer's V coefficients, both marriage and number of children do not have any significant influence on participation.

Concerning formal education, the majority of the agricultural-food technicians have finished their basic education. On one hand, this is why most of the technicians have only a professional level of *qualified operator*. On the other hand, this means, that their technical skills have been acquired through specific training either within the company or through specialised training centres and not in institutions of the educational system.

According to results obtained from using the Somer's d statistic (0.240), level of formal education positively, although moderately, influences level of participation of agricultural-food technicians in CVET. In relation to *professional life* and *social class*, the majority of the agricultural-food technicians are in the middle of their professional life and situate themselves as lower middle class. Based on the Spearman's coefficient of correlation, both *professional life* and *self-reported social class* are not significantly associated to the level of participation

in CVET of the agricultural-food technicians, i.e., these factors apparently do not directly influence participation in continuing training.

The majority of the agricultural-food technicians classify their professional tasks as routine (59.0%) and as manual work (58.6%). According to Somer's d directional measure of association, neither the type of professional task nor the type of function have any significant influence in agricultural-food technicians' participation in CVET.

Very few agricultural-food technicians had any physical deficiency. In fact, all of the physical deficiencies considered in the instrument (visual, mobility, hearing, blood circulation, respiratory, kidney, and oral) presented with 90% or higher "No" responses. So estimation of the association of those deficiencies with level of participation was inconclusive or not significant. The majority of the agricultural-food technicians have a family income below 2000 Euros (95.5%), lives in their own home (77.4%), and have their own car (77.1). According to statistical measures of association based on $\chi 2$ statistics, none of these dimensions appear to be associated to level of participation in CVET.

Except for festivities and for training centres, all of the other access to learning resources are very low and also appear to be not directly associated to level of participation.

### *The participation model*

In relation to Alentejo, taking into consideration results for each class dimension of the ISSTAL model, the findings (see Tab. 5) seem to indicate that *images of learning* (0.547) and *experience* (0.485) are the predictor class dimensions that most influence participation of agricultural-food technicians in CVET activities. Those dimensions present the major positive effects in the participation phenomenon. However, effects of the other class dimensions are also relevant with the exception of the *ascribed roles* and *situational aspects* that present negative beta scores with approximately half value of the other dimensions. In addition, the majority of the predictor class dimensions have lower direct than indirect effects on participation in CVET except for *images of learning experiences* and *attitudinal dispositions* (see Tab. 13).

| Predictor class | Dimensions | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|
| | | | Beta | Sig. | Beta | Sig. |
| Social background & Social roles | Ascribed roles | -0.152 | -0.019 | S | -0.133 | S |
| | Achieved roles | 0.298 | 0.010 | S | 0.288 | S |
| | Experience | 0.485 | 0.018 | S | 0.467 | S |
| | Physical Deficiencies. | 0.292 | 0.052 | S | 0.240 | S |
| | Resources | 0.361 | 0.062 | S | 0.299 | S |
| Personality & Intellectual flexibility | Psycho. Functioning, Beliefs & Values | -0.259 | -0.004 | S | -0.255 | S |
| | Intellectual flexibility | 0.392 | 0.016 | S | 0.376 | S |
| Retained Information | Images of learning experiences | 0.547 | 0.570 | S | -0.023 | S |
| Attitudinal Dispositions | Attitudes to education & learning, to profession, to training conditions | 0.284 | 0.235 | S | 0.049 | S |
| Situational Aspects | Marketing, Awareness of limitations, Awareness of professional factors | -0.164 | -0.164 | S | | |

*Tab. 13 Alentejo Region. Path Analysis: table of effects*

This means that the ISSTAL model, with some minor adjustments, maintains, in general, its configuration (see Figures1 & 6). As can be seen, the adjusted ISSTAL model presents three minor differences from the original one. First, the model does not have a box framing the *Personality*, *Intellectual Flexibility*, *Retained Information*, and *Attitudinal Dispositions* dimensions. Second, all *Social background & Social roles* dimensions have effects in *Personality* and *Intellectual Flexibility* factors. Third, *Retained information* and *Attitudinal dispositions* dimensions have an important direct effect on *Participation in CVET (PCVET*).

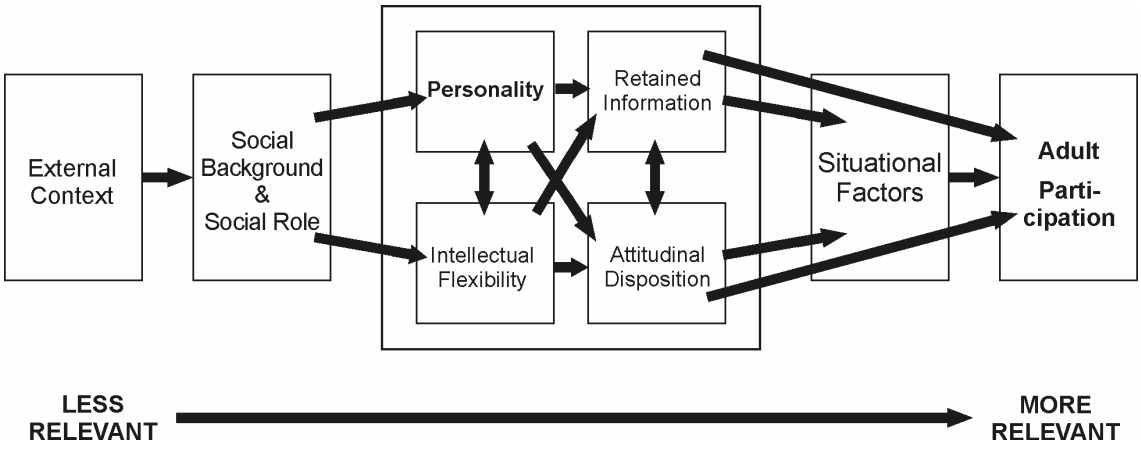


*Fig. 6 The ISSTAL Model (after adjustment for agricultural-food sector)*

Taking into consideration the results obtained from a more detailed analysis (see Table 14), some additional conclusions can be drawn. Within the **ascribed roles**, on the one hand, *gender* has not a significant (direct or indirect) effect on PCVET; on the other hand, *age* (-0.254) has a significant negative influence on participation and *living local until age of 18* (0.361) has a significant positive effect on PCVET. From these results, one can say that the negative effect of the *ascribed roles* comes from the effect of *age*.

Concerning **achieved roles***, formal education* (0.407) presents the major significant effect on PCVET. It is also worthy of mentioning the effects of the *Professional level* (0.366), *Self-reported class* (0.173), and *type of organisation* (0.143) indicators. The other indicators are either not relevant or not significant. In relation to the **experience dimension***,* both indicators (C*haracteristics of job tasks* and *Type of job*) have significant positive effects on participation. From the nine **Physical deficiencies** considered in the instrument, only the *Oral deficiencies* (0.253) and *No physical deficiencies* (0.254) indicators presented a significant effect on PCVET. Concerning **resources,** *Access to training* (0.252) was the indicator with the major effect on participation. However, *Access to museums* (0.216) and *Home ownership* (0.204) have also a relatively relevant effect on PCVET.

As has been mentioned above, **Retained information** and **Attitudinal dispositions** predictor classes present a relevant direct effect on CVET. In fact, those dimensions are the only ones in which direct effects are higher than indirect effects - that constitutes one of the adjustments made in the ISSTAL model. The other adjustment is due to the fact that all of the **Social Background & Social Roles** indicators do not have a significant relationship with the **Retained information** and **Attitudinal dispositions** dimensions. For this

reason, the effect of the **Social Background & Social Roles** predictor class is made through both the *Personality* and *Intellectual Flexibility* dimensions.

| Predictor class | Dimensions | Indicators | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|---|
| | | | | Beta | Sig. | Beta | Sig. |
| Social background & Social roles | Ascribed roles | Gender | 0.095 | 0.077 | NS | 0.018 | NS |
| | | Age | -0.254 | -0.003 | S | -0.251 | S |
| | | Living local until 18 years | 0.361 | 0.052 | S | 0.309 | S |
| | Achieved roles | Civil status | -0.002 | -0.056 | NS | 0.054 | S |
| | | Children | -0031 | -0.036 | NS | 0.005 | NS |
| | | Formal education | 0.407 | 0.020 | S | 0.387 | S |
| | | Profession (level) | 0.366 | 0.043 | S | 0.323 | S |
| | | Condition face to work | 0.075 | -0.039 | NS | 0.114 | S |
| | | Organisation | 0.143 | 0.018 | S | 0.125 | NS |
| | | Professional life cycle | 0.012 | -0.059 | NS | 0.071 | NS |
| | | Self-reported social class | 0.173 | 0.064 | NS | 0.109 | NS |
| | Experience | Characteristics of job tasks | 0.400 | 0.022 | S | 0.378 | S |
| | | Type of job (routine/no routine) | 0.416 | 0.045 | S | 0.371 | S |
| | Physical Deficiencies. | Visual deficiencies | -0.020 | 0.060 | NS | -0.080 | NS |
| | | Mobility deficiencies | 0.102 | 0.074 | NS | 0.028 | NS |
| | | Hearing deficiencies | 0.034 | -0.061 | NS | 0.095 | NS |
| | | Blood circulation deficiencies | 0.014 | -0.057 | NS | 0.071 | NS |
| | | Respiratory deficiencies | 0.115 | 0.066 | NS | 0.049 | NS |
| | | Kidney deficiencies | -0.063 | -0.077 | NS | 0.014 | NS |
| | | Oral deficiencies | 0.253 | 0.021 | S | 0.232 | S |
| | | Other physical deficiencies | 0.053 | 0.057 | NS | -0.004 | NS |
| | | None physical deficiencies | 0.254 | 0.060 | S | 0.194 | S |
| | Resources | Family income | 0.099 | 0.014 | NS | 0.085 | NS |
| | | Home ownership | 0.204 | 0.004 | S | 0.200 | S |
| | | Car ownership | 0.168 | 0.071 | NS | 0.097 | NS |
| | | Access to museums | 0.216 | 0.004 | S | 0.212 | S |
| | | Access to theater | 0.123 | 0.010 | NS | 0.113 | NS |
| | | Access to library | 0.024 | 0.070 | NS | 0.094 | S |
| | | Access to Festivities | -0.195 | -0.074 | S | -0.121 | S |
| | | Access to training | 0.297 | 0.052 | S | 0.245 | S |
| | | Access to none of the previous | -0.112 | -0.003 | NS | -0.109 | NS |
| Personality & Intellectual flexibility | Psycho. Functioning, Beliefs & Values | Persona | -0.259 | -0.004 | S | -0.255 | S |
| | Intellectual flexibility | Intellect | 0.392 | 0.016 | S | 0.376 | S |
| Retained information | Images of learning experiences | Images | 0.547 | 0.570 | S | -0.023 | S |
| Attitudinal dispositions | Attitudes to education & learning, to profession, to training conditions | Attitude | 0.284 | 0.235 | S | 0.049 | S |
| Situational aspects | Marketing, Awareness of limitations, Awareness of professional factors | Situational | -0.164 | -0.164 | S | | |

*Tab. 14 Alentejo Region. Path Analysis: table of effects*

In terms of the dimensions of each class of predictive factors, findings from the factorial analysis indicates some minor differences between the original ISSTAL dimensions considered and the resulting ones (Tab. 15). Those differences might be due to the different interpretation and perspective concerning the indicators considered for measuring each dimension. This may also indicate a difference among training contexts. However, this conclusion can only be drawn after analysis of data from all participant regions.

| Classes | Dimensions considered | Dimensions resulted |
|---|---|---|
| **Social background & social roles** | Ascribed social roles<br>Achieved Social roles<br>Experience & activities<br>Resources & resource access | Ascribed social roles<br>Achieved Social roles<br>Experience & activities<br>Physical deficiencies<br>Resources & resource access |
| **Personality & intellectual flexibility** | Psychological functioning<br>Beliefs & values<br>Intellectual flexibility | Psychological functioning<br>Beliefs & values<br>Intellectual flexibility |
| **Attitudinal dispositions towards** | Learning & education<br>Profession & job<br>Training entities<br>Training activities | Learning & education<br>Profession & job<br>Training conditions |
| **Retained information** | Level of participation in training<br>Satisfaction with training<br>Satisfaction with schooling<br>Self-perception as student | Images of learning<br>Degree of frequency in training activities |
| **Situational factors** | Marketing of training<br>Participation barriers<br>Job characteristics | Marketing of training<br>Awareness of limitations<br>Awareness of professional factors |
| **Criterion variable** | Participation in cont. training | Participation in CVET |

*Tab. 15 Variable Class Dimensions*

### *Attitudes about education, training and learning*

The results concerning the attitudes about education, training and learning (Tab. 16) show the agricultural-food technicians consider as most important that trainers, apart from giving information about the subject-matter, should know how to use methods that facilitate learning *(*Mean Rank of Friedman test=20.55; 20.67; Sg=0.000). In addition to those feelings, technicians consider important that the training entities should have people to give information concerning training offers (Mean Rank=18.44; Sg=0.000) and the training courses should be offered near either work or where they live (Mean rank=18.08; Sg=0.000). In contrast, people do not value very much that the training courses be offered during the summer time (Mean rank=7.46), be offered either in universities or in hotels & restaurants (Mean rank=5.97; 6.53). They value much more if the training is offered at the company (mean rank=16.94).

| Attitudes about education and learning | Mean Rank |
|---|---|
| I like to study. | 10.33 |
| The best way for people to learn is by participating in training programs. | 13.81 |
| Participating in training programs is a good way to occupy one's free time. | 12.18 |
| Going back to school as an adult is, in my opinion, an embarrassing situation. | 10.21 |
| Education for adults is as important as education for children. | 17.50 |
| I can learn everything I want, without participating in training programs. | 9.34 |
| Participating in training programs brings me some benefits. | 15.19 |
| In what concerns the company where you work, how you feel in terms of satisfaction | 18.34 |
| If your company allowed you to participate in training programs, how you feel in terms of satisfaction | 15.93 |

| Attitudes about education and learning | Mean Rank |
|---|---|
| I will only make the decision of participating in training programs after having detailed information about them. | 16.13 |
| I am selective as far as the institution promoting the training programs is concerned. | 11.74 |
| It is important that. when asked. the training entities will make available some personnel to give information on the training programs. | 18.44 |
| It is nice to attend training in the summer months. | 7.46 |
| Trainers must have the needed qualifications to give training | 20.55 |
| Trainers. apart from giving information about the subject-matter, should use methods that facilitate learning. | 20.67 |
| In training programs, the trainer should limit himself to teaching about the subject-matter | 9.19 |
| There should be only 15 trainees in the training programs. | 15.08 |
| The training programs should be held near one's place of work or one's house (less than 10 Km). | 18.08 |
| It would be better if training programs were held at universities. | 5.97 |
| It would be better if training programs were held in rooms rented in the city. | 9.32 |
| It would be better if training programs were held in hotels, restaurants, etc. | 6.53 |
| It would be better if training programs were held in the company where you work. | 16.94 |
| In my opinion, it is important for the training entities to be equipped with a bar/canteen/ socialising room. | 15.26 |
| It would be better if training programs were held in labouring hours. | 13.79 |
| Training programs should have an average duration of one month. | 9.40 |
| Training programs should have an average duration of a quarter of a year. | 13.63 |

*Tab. 16 Attitudes to education, training and learning*

### *Reasons for not participating in training*

Technicians working in the Alentejo agricultural-food companies consider the main reason for not participating in training is that the timetables of the training offers are incompatible with their working timetable (see Tab. 17). In addition they consider that attending training offers is not a relevant difficulty in terms of family life.

| Reasons for not participating in training | Mean Rank |
|---|---|
| Attending training programmes harms my family life | 1.93 |
| The timetables are incompatible with my work timetable | 2.97 |
| I do not like the place where the training programme is held | 2.72 |
| I do not want to sacrifice the little free time I have. | 2.39 |

*Tab. 17 Reasons for no participating in training*

## The ICT Sector of Lisboa & Vale do Tejo

### *Characteristics of the Target Group*

In contrast to the agricultural-food technicians' sample, the sample of ICT technicians is characterised by being younger with a marked gender inequality: men comprise 78.1% of the sample. However, there is not a significant difference between men and women in terms of participation in CVET. That means gender does not influence directly ICT technicians' participation in CVET (Cramer's V = 0.244; sig = 0.075). The majority of the ICT technicians are aged between 25 and 34 years old. Although significant at 0.05 level, age of the ICT technicians appears not to have a strong direct effect on participation in CVET

(Sommers' d = -0.128; sig =0 .036).

The ICT technicians working in the Lisboa & Vale do tejo Region have mainly lived until 18 years old in medium sized or large cities. According to Cramer´s V (0.133; sig = 0.675) measure of association, that does not have a significant direct influence on participation in CVET. Being a younger population, almost half of the ICT technicians are single (43.0%) and the other half are married (53.1) and have less than 2 children (98.4%). According to Phi and Cramer's V coefficients, both marriage and number of children are not significantly associated with participation, i.e., those dimensions appear not to directly influence participation in CVET of the ICT technicians.

Concerning formal education, the majority of the ICT technicians have finished either higher (63.3%) or secondary (31.3%) education. On one hand, this is why most of the ICT technicians have a professional level of technician or higher technician. On the other hand, this means, that their technical skills have been acquired through formal education.

According to results obtained from Sommers' d statistic (d=0.051; sig=0.632), level of formal education does not influence level of participation of ICT technicians in CVET. In relation to *professional life* and *social class*, the majority of the ICT technicians have not yet reached the middle of their professional life and situate themselves as higher middle class. Based on the Spearman's coefficient of correlation, both *professional life* and *self-reported social class* are not significantly associated to the level of participation in CVET of the ICT technicians, i.e., they apparently do not directly influence participation in continuing training.

The majority of the ICT technicians classify their professional tasks as varied (69.0%) and as involving work with machines (84.1%). Both the type of professional tasks (Sommers' d=0.159; sig=0.003) and the type of function (Cramer's V= 0.268; sig=0.008) performed by the ICT technicians appear to have, although moderate, a direct significant influence on participation in CVET.

Almost none of the ICT technicians carry any physical deficiency. In fact, all the physical deficiencies considered in the instrument (visual, mobility, hearing, blood circulation, respiratory, kidney, and oral) received negative responses close to 100%. So estimation of the association of those deficiencies with level of participation was inconclusive or not significant. The majority of the ICT technicians have a family income between 1000 and 3000 Euros (69.5%), live in their own home (70.3%), and have their own car (74.2%). According to statistical measures of association based on $\chi 2$ statistics, none of these dimensions appear to be directly associated to the level of participation in CVET.

Except for festivities, all the other access to learning resources present a relatively higher value compared to those of the agricultural-food technicians. This is comprehensible given that the ICT technicians live and work near Lisbon. Except for access to training all the other access dimensions appear not to be directly associated to level of participation.

### *The participation model*

For the Lisboa & Vale do Tejo Region, findings for each class dimension of the ISSTAL model (Tab. 18) have produced similar results to those from Alentejo. *Images of learning* (0.513) has the most influence on participation of ICT technicians in CVET activi-

ties. The second most important influence for ICT technicians is *intellectual flexibility* (0.403), while for agricultural-food technicians this was *experience* (0.485), with *intellectual flexibility* (0.392) presenting a similar value as for the ICT technicians. As in Alentejo those predictor dimensions present the major positive effects on the participation phenomenon. The effects of the other class dimensions are also relevant with the exception of the *Physical deficiencies* (-0.129) and *Psychological functioning* (-0.176) that present negative *beta scores* with approximately half the value of the other dimensions. The majority of the predictor class dimensions have lower direct than indirect effects on participation in CVET except for *images of learning experiences* and *attitudinal dispositions*. That means that the ISSTAL model, as for the agricultural-food technicians, also serves, with some minor adjustments, for explaining participation in CVET of the ICT technicians (Fig. 1 & 6). Thus, the adjusted ISSTAL model for the ICT technicians presents the same three minor differences from the original one. First, the model does not have a box framing the *Personality*, *Intellectual Flexibility*, *Retained Information*, and *Attitudinal Dispositions* dimensions. Second, all *Social background & Social roles* dimensions have effects in *Personality* and *Intellectual Flexibility* factors. Third, *Retained information* and *Attitudinal dispositions* dimensions have an important direct effect on *Participation in CVET*.

| Predictor class | Dimensions | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|
| | | | Beta | Sig. | Beta | Sig. |
| Social background & Social roles | Ascribed roles | 0.214 | 0.004 | S | 0.210 | S |
| | Achieved roles | 0.297 | 0.007 | S | 0.290 | S |
| | Experience | 0.263 | -0.006 | S | 0.269 | S |
| | Physical Deficiencies. | -0.129 | -0.004 | S | -0.125 | S |
| | Resources | 0.297 | 0.006 | S | 0.291 | S |
| Personality & Intellectual flexibility | Psycho. Functioning, Beliefs & Values | -0.176 | 0.092 | S | -0.268 | S |
| | Intellectual flexibility | 0.403 | 0.134 | S | 0.269 | S |
| Retained information | Images of learning experiences | 0.513 | 0.449 | S | 0.064 | S |
| Attitudinal dispositions | Attitudes to education & learning, to profession, to training conditions | 0.219 | 0.279 | S | -0.060 | S |
| Situational aspects | Marketing, Awareness of limitations, Awareness of professional factors | 0.195 | 0.195 | S | | |

*Tab. 18 Lisboa & Vale do Tejo Region. Path Analysis: table of effects*

Taking into consideration results obtained from a more detailed analysis (Tab. 19), some additional conclusions can be drawn. Within the **ascribed roles**, on one hand, *gender* has not a significant (direct or indirect) effect on PCVET; on the other hand, *age* (-0.242) has a significant negative influence and *living local until age of 18 years* (0.136) has a small positive effect on PCVET. From these results, as for the agricultural-food technicians, one can say that the negative effect of the *ascribed roles* come from the effect of *age*. Concerning **achieved roles***, Professional life cycle* (0.372) is the indicator with the major significant effect on PCVET. The *formal education* also presents a relevant value but is only significant in terms of an indirect effect (0.151). It is also noteworthy to mention the indirect effect of *Self-reported class* (0.118). The other indicators are either not relevant or not significant. In relation to the **experience dimension***,* both indicators (C*haracteristics of job tasks* and *Type of job*)

significantly affect Participation. Concerning the nine **Physical deficiencies** no indicator presented a significant effect. In addition some of them present inconclusive results. In relation to **Resources**, *Access to training* (0.212) was the indicator with the major effect on Participation. However, *Access to museums* (0.142), *Access to Library* (0.154) and *Access to Festivities* (0.149) also had an effect on PCVET. In summary, one can say that findings for ICT technicians of the Lisboa & Vale do Tejo region are very much similar to those for the Agricultural-food technicians of the Alentejo region.

As for the agricultural-food technicians, **Retained information** and **Attitudinal dispositions** predictor classes of ICT technicians' participation in CVET are the only dimensions in which the direct effects are higher than the indirect effects. For this reason, and as for the case of the agricultural-food technicians, that constitutes one of the adjustments to be made to the ISSTAL model. The other adjustment comes from the fact that all of the **Social Background & Social Roles** indicators do not have a significant relationship with the **Retained information** and **Attitudinal dispositions** dimensions. For this reason, and as for the agricultural-food technicians of Alentejo, the effect of the **Social Background and Social Roles** predictor class in the case of the ICT technicians of the Lisboa & Vale do Tejo is made through both *Personality* and *Intellectual Flexibility* dimensions.

| Predictor class | Dimensions | Indicators | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|---|
| | | | | Beta | Sig. | Beta | Sig. |
| Social background & Social roles | Ascribed roles | Gender | 0.095 | 0.027 | NS | 0.200 | NS |
| | | Age | -0.242 | -0.002 | S | -0.240 | S |
| | | Living local until 18 years | 0.136 | 0.033 | S | 0.103 | S |
| | Achieved roles | Civil status | -0.088 | -0.015 | NS | -0.073 | NS |
| | | Children | -0.063 | -0.056 | NS | -0.007 | NS |
| | | Formal education | 0.145 | -0.006 | NS | 0.151 | S |
| | | Profession (level) | -0.054 | -0.026 | NS | -0.028 | NS |
| | | Condition face to work | 0.052 | 0.008 | NS | 0.044 | S |
| | | Organisation* | | | | | |
| | | Professional life cycle | 0.372 | 0.080 | S | 0.292 | S |
| | | Self-reported social class | 0.029 | -0.089 | NS | 0.118 | S |
| | Experience | Characteristics of job tasks | -0.129 | 0.108 | S | -0.237 | S |
| | | Type of job (routine/no routine) | 0.355 | 0.016 | S | 0.339 | S |
| | Physical Deficiencies. | Visual deficiencies | -0.068 | -0.078 | NS | 0.010 | NS |
| | | Mobility deficiencies* | | | | | |
| | | Hearing deficiencies | -0.136 | -0.134 | NS | -0.002 | NS |
| | | Blood circulation deficiencies* | | | | | |
| | | Respiratory deficiencies* | | | | | |
| | | Kidney deficiencies | 0.093 | 0.077 | NS | 0.016 | NS |
| | | Oral deficiencies* | | | | | |
| | | Other physical deficiencies* | | | | | |
| | | None physical deficiencies* | | | | | |

| Predictor class | Dimensions | Indicators | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|---|
| Social back-ground & Social roles | Resources | Family income | 0.178 | 0.026 | NS | 0.152 | NS |
| | | Home ownership | -0.159 | -0.024 | NS | -0.135 | NS |
| | | Car ownership | 0.154 | -0.011 | NS | 0.165 | NS |
| | | Access to museums | 0.142 | 0.052 | S | 0.090 | S |
| | | Access to theater | 0.093 | -0.013 | NS | 0.106 | NS |
| | | Access to library | 0.168 | 0.014 | NS | 0.154 | S |
| | | Access to Festivities | 0.158 | -0.023 | NS | 0.181 | S |
| | | Access to training | 0.212 | 0.063 | S | 0.149 | S |
| | | Access to none of the previous | -0.027 | 0.017 | NS | -0.044 | NS |
| Personality & Intellectual flexibility | Psycho. Functioning, Beliefs & Values | Persona | -0.176 | 0.092 | S | -0.268 | S |
| | Intellectual flexibility | Intellect | 0.403 | 0.134 | S | 0.269 | S |
| Retained information | Images of learning experiences | Images | 0.513 | 0.449 | S | 0.064 | S |
| Attitudinal dispositions | Attitudes to education & learn-ing, to profession, to training conditions | Attitude | 0.219 | 0.279 | S | -0.060 | S |
| Situational aspects | Marketing, Awareness of limitations, Awareness of professional factors | Situational | 0.195 | 0.195 | S | | |

*Tab. 19 Lisboa & Vale do Tejo. Path Analysis: table of effects (Criterion variable: PCVET) Inconclusive results*

### *Attitudes about education, training and learning*

Taking into consideration results concerning the attitudes about education, training and learning (Tab. 20), the findings seems to indicate that ICT technicians consider as most important that trainers, apart from giving information about the subject-matter, should know how to use methods that facilitate learning (Mean Ranks of Friedman test=21.78; 21.79; Sg=0.000). In addition to those feelings, the ICT technicians consider it important that the training entities should allow people to participate in training (mean rank=20.32; Sg=0.000) and have people to give information concerning training offers (Mean Rank=18.66; Sg=0.000). On the other hand, ICT technicians consider it very much relevant to participate in training once the training can bring them benefits (mean rank=19.04; Sg=0.000) and that education is as of much importance for adults as for children (mean rank=18.82; Sg=0.000). ICT technicians do not consider that studying in adulthood is embarrassing (mean rank= 4.09; Sg=0.000).

| Attitudes about education and learning | Mean Rank |
|---|---|
| I like to study. | 17.38 |
| The best way for people to learn is by participating in training programs. | 14.53 |
| Participating in training programs is a good way to occupy one's free time. | 12.50 |
| Going back to school as an adult is, in my opinion, an embarrassing situation. | 4.09 |
| Education for adults is as important as education for children. | 18.82 |
| I can learn everything I want, without participating in training programs. | 9.48 |
| Participating in training programs brings me some benefits. | 19.04 |
| In what concerns the company where you work, how you feel in terms of satisfaction | 14.57 |

| Attitudes about education and learning | Mean Rank |
|---|---|
| If your company allowed you to participate in training programs, how you feel in terms of satisfaction | 20.32 |
| I will only make the decision of participating in training programs after having detailed information about them. | 16.37 |
| I am selective as far as the institution promoting the training programs is concerned. | 14.43 |
| It is important that, when asked, the training entities will make available some personnel to give information on the training programs. | 18.66 |
| It is nice to attend training in the summer months. | 9.56 |
| Trainers must have the needed qualifications to give training | 21.78 |
| Trainers, apart from giving information about the subject-matter, should use methods that facilitate learning. | 21.69 |
| In training programs, the trainer should limit himself to teaching about the subject-matter | 7.37 |
| There should be only 15 trainees in the training programs. | 11.81 |
| The training programs should be held near one's place of work or one's house (less than 10 Km). | 14.78 |
| It would be better if training programs were held at universities. | 7.38 |
| It would be better if training programs were held in rooms rented in the city. | 8.82 |
| It would be better if training programs were held in hotels, restaurants, etc. | 8.34 |
| It would be better if training programs were held in the company where you work. | 12.45 |
| In my opinion, it is important for the training entities to be equipped with a bar/canteen/ socialising room. | 13.81 |
| It would be better if training programs were held in labouring hours. | 14.75 |
| Training programs should have an average duration of one month. | 9.71 |
| Training programs should have an average duration of a quarter of a year. | 8.58 |

*Tab. 20 Attitudes to education, training and learning*

### *Reasons for not participating in training*

ICT Technicians working in the Lisboa & vale do Tejo companies consider the main reason for not participating in training is because the timings of the training offers are incompatible with their working timetable (Tab.21). In addition they consider that attending training offerings is not problematic in terms of family life.

| Reasons for no participating in training | Mean Rank |
|---|---|
| Attending training programmes harms my family life | 2.16 |
| The timetables are incompatible with my work timetable | 2.99 |
| I do not like the place where the training programme is held | 2.46 |
| I do not want to sacrifice the little free time I have. | 2.39 |

*Tab. 21 Reasons for not participating in training*

## *4.6 Final considerations*

Results from the analyses indicate that the ISSTAL model may serve as a theoretical frame to study and analyse relationships between a set of characteristics and aspects and participation in training activities of the technical workers of the agricultural-food companies in Alentejo and of ICT companies in the Lisboa & Vale do Tejo region. On the one hand, the analysed dimensions were related to participation in continuing education offers. On the other hand, the number and nature of class predictive factors and their dimensions, though slightly different from the ones posited in the ISSTAL model (Tab. 6), do not suggest the need for major changes in the model. Those differences may have resulted from the differ-

ent interpretation and perspective concerning dimensions and their indicators and/or characteristics of the context, the first class of variables considered in the ISSTAL model.

Findings suggest that *images of learning*, *intellectual flexibility*, and *experience* dimensions are the most influential characteristics on participation in continuing training. In addition, operating in a different way from that predicted in the ISSTAL model, both *retained information* and *attitudes* have a relevant direct effect on participation. For this reason, public training institutions should implement strategies to demonstrate the importance of training for professional and company development. They also should implement strategies focusing on the need for high quality training. In addition, it is essential not only to provide training for updating technical skills but also to develop a set of more transversal key skills such as problem solving, communication, management and ICT skills. Companies should make efforts not only to reduce participation barriers but also to implement incentive strategies emphasising the role of training for job performance.

That *images of learning*, *intellectual flexibility*, and *experience* dimensions were the most influential aspects on participation may suggest the need to promote strategies for improving self-directed learning and learning to facilitate the learning of the others. On the other hand, the relevant direct effect of *retained information* and *attitudes* on CVET may indicate a need for promoting different strategies for learning how to organise knowledge and understand how important lifelong learning is for the development of technical workers. For this reason, it is vital to develop strategies for promoting and facilitating self-learning, mainly through e-learning strategies, of the technical agricultural-food and ICT technicians.

In summary, policies for promoting quality in CVET should be developed and there is a need to integrate incentives to make employers and employees aware of the role of training for job performance and of the need for self-directed learning in addition to participation in CVET offers.

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# 5 Spain

*Florentino Blázquez and Manuel Lucero*

## *Participation in Continuing Vocational and Training (VET): a need for a sustainable employability in Badajoz, Extremadura.*

### *5.1 Abstract*

The present survey aimed to analyse factors associated to participation in continuing training activities of employed technicians in building industries and in Information and Communication Technologies (ICT) located in Badajoz, in Extremadura. More specifically, the study intended to understand how factors associated to participation in continuing vocational education & training (CVET) activities influence employed technicians' decision to participate in those activities. Understanding adult participation in continuing qualification activities will give a relevant contribute not only for promoting participation of the none-participants but also for designing and setting up effective CVET programmes.

This study was theoretically framed by the *Interdisciplinary, Sequential-Specificity, Time-Allocation, Life-span* (ISSTAL) model of social participation (Smith & Macaulay, 1980) and already tested in USA by Cookson (1986) for studying adult participation in learning activities. The study used a cross-sectional survey approach with an instrument specifically developed to collect data from a two-stage stratified random sample drawn from a population constituted by all technicians working in the buildin industries and in ICT of Badajoz, in Extremadura.

Data was firstly submitted to (*categorical and non-categorical*) *principal component factorial analysis* to identify class dimensions of factors influencing individuals´ participation in training activities. Relationships between the different factors and participation were estimated *by* a set of *multiple categorical regression analyses* framed by a *path analysis strategy*.

Results show that, in general, the ISSTAL model is useful for explaining and understanding participation of building technician employees (Badajoz) and ICT technicians (Badajoz) in continuing training activities. However, the theoretical model as such needs some adjustments in order to better understand how and why those factors influence technicians' participation in CVET.

### *5.2 Context and new functions for continuous training in Spain*

In Spain, as well as in other countries, there have been changes that have had repercussions on the research and practice of training in companies. First of all, changes in demographical aspects of people which incorporate into the Labour Market. The reduction in the number of young people and the resulting ageing of the active population, the increase of women's participation, the increase of minority groups and the multicultural composition of the labour force constitute aspects that affect contents, processes and methodologies of training systems.

Secondly, the increase of job posts in the service sector introduces new qualification demands that were not needed in the industrial sector jobs. The need to participate in the delivery of the customers service as it is produced, the need to adjust it to that client's demands and the requirements related to the quality guarantee are elements that have a clear influence on training and the role it plays in this type of organisations.

The third aspect is constituted by the growing influence of international markets. This provokes that organisations must consider the need to participate in these markets: product markets, labour markets and financial markets, and this involves a labour force that is able to manage and act in a multicultural environment.

The last aspect is the training of young people who have reached neither acceptable levels of basic training in the regulated educational system, or an appropriate qualification for the new job posts. This question is related, in Spain particularity, to the training and preparation of unemployed people.

It is being assumed in Spain that continuous training in companies is an important and strategic performance framework in the economy, society, current productive system and Labour Market. Such training is vital in order to achieve appropriate levels of supporting economic development and to improve people's quality of life. Thus, not only companies and their training departments, but also governments and social agents in the labour environment are getting more and more interested in this phenomenon.

The functions of continuous training in companies go beyond those that could be deduced from a superficial exam of the needs derived from current production plans in each company. On the other hand, demands that companies make has increased during the last years, quantitatively (in the number of formative actions and courses) as well as in the type of interventions performed. This has been produced to such a degree that training has extended itself through the whole Spanish geography. The kind of contents has also being modified, which should deal with new training criteria: to provide general basic knowledge, to update knowledge, to acquire new competencies, to cover the whole field of competencies and functions, to transfer knowledge and to manage the existing capital of competencies and human potential.

## *5.3 Study Context*

### 5.3.1 The building sector in Badajoz, Extremadura

The building sector, besides being the motor of the regional economy and richness generator, is a traditional job source for the active population of this community. As a matter of fact, it employs the greatest number of people from Extremadura, a 14.89% of the total of the region's active population. In this field, it is only surpassed by the service sector and appears above industry and agriculture. Such data are included in the "*Extremadura in numbers*" publication of the current year, which is edited by the Economy Council of the Extremadura Board. This demonstrates the sector's permanent ability to create job posts.

By provinces, the weight of the sector as job creator is greater in the province of Cáceres, where it employs a 16.89% of the population, whereas in Badajoz the percentage is of a 13.67%.

However, the comparison by sexes is undoubtedly the most striking and the one that creates greater differences. The sector employs more than one out of five men, a 21.17%. By contrast, only the 1.6 of women in Extremadura works in the building sector.

In 2001, the signs of exhaustion of the expansive behaviour of the Labour Market were confirmed, as they were underlined in the 1999 and 2000 reports. The active population in Extremadura moved from 440,200 people in the year 2000 to 435,900 in 2001. As stated in the "Economic Situation of Extremadura" report, this fall in 4,300 people was due to the fact that 5,500 unemployed people left the market, "low-spirited by the worsening of expectations with regard to more favourable periods in the past".

The building sector experienced the same tendency. An active population of 67,100 people in 2000 decreased in a thousand in the previous report. From them, the report recognises 50,300 as employed population, hardly a variation of the 0.4% (200 people more) as regards the year 2000. By percentage, from those workers that are qualified in the building sector and show interest to find a job post (which is called active population), a 76.1% were really working in 2001.

The unemployed population in the sector reached 15,800 people, while the previous year was of 17,000 active people. This shows a fall of 7.1 points produced by the behaviour of the sector in the creation of employment but mainly due to the fact that active workers have left our community in search of other jobs.

**Unemployment rate**

The behaviour of the sector regarding employment creation is better observed in relative terms. The 15,800 unemployed people in the building sector along 2001 created an unemployment rate of 23.96%, the second highest in the region only surpassed by agriculture.

However, we must bear in mind that during the year 2000 one out of four active people in building were unemployed (25.4% actually). In conclusion, we could say that the unemployment rate in the sector continues to be one of the most noticeable, though it decreased along the past year. Thus, we can observe that the unemployment rate in the sector decreased in a 1.44%, collaborating in an important way with the descent of the unemployed people rate in the whole region, which was of 1.02 percentage points.

The change in habits and lifestyle, the economic transformations and, to put it briefly, a wide list of factors related to the evolution of times have favoured that building becomes a sort of "mattress" among the productive sectors from Extremadura.

During the last years, the sector has welcomed a considerable number of land workers. The numbers show that there is no generational relief in the countryside and that farmers' children do not seem to be decided to continue their parents' labour. This situation provokes that people which, for any reason, do not continue their studies in the University, finish working in the building sector, most of the times without the required qualification.

Many of the industries in Extremadura are dependent on the building sector, which occupies nowadays a 15% of the active population of our community. What can we do? We have a considerable housing, but many of them are occupied more than twenty years ago. Thus, it is necessary to carry out an aggressive politics regarding rehabilitation. We need more aids. Besides, Extremadura has a very rich architectural heritage, and this aggressive politics should also include this branch since the percentage of labour force needed in rehabilitation is bigger then the one needed in building new structures. In the same way, we should have a more forceful politics as regards accessible housing because there is an important sector of our society that demands it.

**Breakdown by Administration**

As regards the source of this public investment, the Central Administration invested more, since it dedicated to the building sector around 317 millions, that is to say, it increased the amount in a 63 per cent in relation to 1988.

The Regional Government invested more than 174 millions, increasing the contribution in almost a 31 per cent, while the City Councils destined a total of 813 millions before more than 183 millions invested in 1998.

The local Administration has been, thus, the only institution (globally considered) that has reduced its economic contribution to the building sector. The decrease regarding the previous year has been of the 57%.

In conclusion, we find four or five years of prosperity in the sector, mainly due to public investment and the fall in the rates of interest, but the fact is that rates are increasing again and this can affect the sector.

**Challenges for the sector**

As regards the challenges that the sector must face, as first priority we need to consider the need to reduce accidents, a problem that must be solved with the participation of everyone involved in this sector (Administration, real state developers, designers, builders, subcontractors, trade unions and workers.)

The SEOPAN collaborates in initiatives such as the one developed last year with the definitive implantation of the *Professional Record*. Along with this, a specific body has been created whose activity has started in 2002. It is an instrument to improve accidents –shared by companies and trade unions- that performs the functions of consciousness raising towards prevention by means of visits to building areas. Besides, the employers' organisations and trade unions continue to participate in an active way in the Safety Commissions created by public bodies such as the Ministry of Public Works and the Economy and directed to adopt measures to prevent accidents.

SEOPAN and its companies consider this an essential and permanent concern as long as there are serious or mortal accidents. A way of measuring and estimating this concern is shown in the fact that there is more investment to improve safety studies in the project phase.

SEOPAN considers that the sector must increase its efforts and the destination of re-

sources to research and innovation to reduce the difference found between the known theoretical achievements and their practical application,

*"still insufficient in our managerial web". "We also need a greater support from public institutions in order to develop technologically the building sector, traditionally forgotten in the I+D+i national programmes." Following this line, it underlines a better relationship between electronic market and building. "The unstoppable opening of specific site where our companies have already taken the first step with great investments must be given power to, in a much more important way than it is done nowadays."*

Another challenge underlined in the activity 2001 report refers to the diversification and internalisation of the sector. Analysts coincide on pointing out that the new future activities that Spanish building firms will develop will aim at entering in businesses of good profitability. This diagnostic will involve focusing greater efforts towards external geographical environments, above all by companies with greater capacity and experience in internalisation and diversification. However, to achieve this it is necessary to reach enough critical mass and have the best human teams to be able to succeed in those highly competitive markets. "SEOPAN companies have openly faced this challenge and the excellent results obtained in the last years show that they are working in the adequate direction to overcome this challenge effectively".

### 5.3.2 The TIC sector in Extremadura (Spain)

In the last years, from the 1993 recession, Spanish economy has always grown more than the European average. Spanish companies have increased their competitive capacity in the new context of the Economic and Monetary Union. Neither American recession, nor the 11-S events or the slowing down of German economy have affected Spanish growth in a meaningful way. This has relatively contributed to the development of such a novel sector as the New Information and Communication Technologies.

But probably, due to their novelty and scarce repercussion in our region, it has been very difficult for us to find data about the situation of this sector in Spain and even more in Extremadura. However, the COTEC Foundation has dedicated most of its activities in the last years to develop a deep analysis of the elements of the Spanish Innovation System, and the nature of the relationships established in it among business, administrative and university agents. Thanks to these studies, and to others developed by different public and private institutions, we have discovered the system's weaknesses and strengths, and the strategies used by the agents that intervene within it.

In the COTEC 2001 report, it has been presented the application of new technologies in the Information Society as regards world market of the main countries of the OCDE and European Union, comparing the use and access to Information and Communication Technologies (TIC) among these countries, highlighting the Spanish position.

The Spanish Commerce, Industry and Navigation Chambers have developed a study about the incorporation of the TIC in the Autonomous Regions. The results appear in their 2000 Annual Economic Report. This study has allowed underlining that the most important degree of incorporation is logically found in Madrid, Cataluña, and País Vasco, that is to say, in the more industrialized communities and, in Madrid, with a significantly developed tertiary sector. Only these three regions are placed above the national average in the use of new

technologies; all the Objective 1 regions present a significant underdevelopment, particularly Extremadura and Castilla-La Mancha.

The synthetic indicator allows observing the substantial difference in the TIC development between, on the one hand, Madrid, Cataluña and País Vasco and, on the other, the rest of regions. Madrid, above all, stands out against the rest of regions, while Extremadura is the only one that decreases the 50% in the synthetic ratio of penetration of new technologies.

Most Autonomous Communities have made or are making strategic or managing programmes to promote the Information Society, as Extremadura has: the Manager Strategic Plan of the Information Society in Extremadura (INFODEX). At the same time, it also has the Foundation for the Development of Science and Technology, FUNDECYT, which plays the role of Centre/Observatory of the Information Society.

Nevertheless, in Extremadura it is important the attention that New Technologies offer to disadvantaged social groups, where we can include women (mostly from rural areas), people with mental or physical disabilities, old people, immigrants, people with low economic or social level, cultural minorities, etc.

Extremadura also possesses an Intranet that connects the whole regional Administration with educational and health centres.

### The use of the TIC in state and autonomous companies and administrations in Spain

In its 2001 Annual Report, the Retevisión Foundation has analyzed in detail the use of TIC in Spain, particularly in Autonomous Regions, finding substantial differences in its development and promotion.

According to the results of a survey published by the Retevisión Foundation in the Annual Report about the development of the Information Society in Spain (Spain 2001), companies within the high technology and service sectors stand out due to the introduction and use of the TIC.

Most surveyed companies have access to the Internet (an 85% of the total), even though in the high technology and service sector almost all companies have this technology.

In the group of companies only one out of three (36.8%) has web page, while in the sectors of high technology two out of three companies (68.4%) have web page.

While one out of three companies in the high technology and service sector have an Intranet, the proportion in the rest of companies is one out of ten or even less.

Among companies in the service sector, more than the 10 % already make sales via internet.

By geographical areas, the integrated and advanced companies stand out particularly in Madrid, followed by the Baleares Islands and País Vasco. Emergent companies and those aiming at integration are, to a greater extent, in the Canary Islands, **Extremadura**, Navarra, Aragón, Andalucía, Cataluña, and Asturias.

It is clear the direct relationship between employees' educational level and the level of TIC

equipment and their use by companies. Even though a high level of qualification in employees favours the integration of Information and Communication technologies in companies, the problems that make the introduction difficult do not finish in the human capital, but extend themselves, in a similar proportion, to other aspects of the company's life such as size, activity type or financial aspects.

## The lack of supply of professionals with training in the TIC in Spain and Autonomous Regions

The existence of a labour force with good training in these technologies is a concern of the governments of the OCDE, which underlines in its *ICT Skills and Employments* study (November 2000) the following conclusions regarding human resources' qualification in the New Information and Communication technologies (TIC).

The training of human resources constitutes one of the basic pillars of the Information Society. In all the professional media of the Information and Communication sector, the problem of lack human resources specialised in the TIC is more and more felt. The United States, the first country in Information and Communication Technologies, has developed, like other countries, an active policy of absorption of specialists in these technologies coming from all over the world. The international forums, like the European associations of electronics and telecommunications, raised the alarm in the middle of the nineties. Big companies witnessed that their future development was in danger due to the lack of TIC professionals.

In Spain, the lack of human resources in the TIC sector, even though is not important compared to big countries of the European Union, is, however, already notorious as it is underlined in the analysis of the main indicators of this issue by Gizartel (2000), Gizardata (2000) of the Annual Report about the development of the Information Society in Spain made by the Retevisión-Auna Foundation (2001).

When we compare the proportion of Computer Science graduates regarding the total of University graduates with those of other OCDE countries, it becomes evident that Spain is in an advanced situation.

In 1998, more than three out of one thousand graduates came from a computer science engineering, while the European average was in 2.3 and the OCDE total in 1.7. Spain was only under Ireland, Iceland, United Kingdom, and Australia.

In 1998 there were a total of 8,923 people employed in I+D in TIC, which represented a 9.2% of the total employed in I+D in that year. From them, three out of four were employed in companies. Such data can be evaluated positively and contrasts in a significant way with what occurs in Spanish economy in general, where hardly a 20% of people devoted to I+D are in companies.

Not only the proportion of TIC researchers in the Public Administration and high education is minority, but its evolution has stopped during the last five years.

## Spanish Participation in the V Framework Programme of the European Union (1998-2000)

In the 2000 COTEC Report, the V Framework Programme has been presented in detail. It has been structured in four actions: the first includes four topic programmes; the other three are horizontal and cover international co-operation, PYMES' (small and medium companies) innovation and participation and the improvement of human potential and socio-economic knowledge. Topic programmes gather the main lines by means of key actions, of generic technologies and support to research infrastructures. The global budget is of 14,960 million euros. The main characteristic of projects is their European dimension: it is needed at least the joint participation of partners from two different member countries (the average by project is usually of four or five participants) and the main selection criterion in the scientific excellence. In the resolved official announcements of 1999 and 2000, a total of 5,980 million euros have been distributed in grants; from them, a 6% (357 million euros) have been captured by participating Spanish groups in 1,350 projects of 5,000 that were financed (27%). As regards the IV Framework Programme, the return experiments a decrease of a 0.3% which can be due to the increase in the number of participating groups in the V Framework Programme.

As it was expected, this level is proportional to each country's research potential: thus, we observe that after the "big" four, Germany, France, United Kingdom, and Italy. Spain is in an intermediate position, together with the Low Countries, with a 7.2% of contribution and a 6% of global return. The Spanish position with respect to its European partners remains the same than in the IV Framework Programme.

In terms of the distribution of Spanish participation by Autonomous we can observe that there is still a big concentration in Madrid and Cataluña, which continue in the levels of previous programmes with a slight backward movement of Madrid and the improvement of Andalucía, Aragón, Castill la Mancha, Cataluña, and Navarra. Extremadura´s position is more than significant.

## Extremadura, the region that uses telephones, cellular phones, and internet in a smaller proportion

Extremadura is the Spanish region with fewer telephones. Besides, it is also the one that presents the lowest rate in the use of cellular phones and the Internet. These data, which place Extremadura in the last position of the development queue, are included in the preliminary report of the survey that has been carried out in Spanish homes about information and communication technologies. This survey has recently been published by the Telecommunications Market Commission (CMT) and the Statistics National Institute (INE).

There is no region in Spain with greater number of homes without telephone than Extremadura. While in País Vasco the percentage of houses with telephone lines reaches the 97.2%, in Extremadura this rate approaches the 81.6%, the lowest in the country (almost nine tenths below the national average). Only two regions approach Extremadura: Andalucía and the Canary Islands, with the 84.6 and 84.7% respectively.

In absolute terms, more than 29.5 Spanish people have cellular phones. But in the same

way, there is no Autonomous Community with less percentage of citizens that use cellular phone. While 66 out of one hundred people from Madrid, or 60 out of one hundred people from Cataluña use cellular phones daily, the rate of people from Extremadura decreases to a 44%.

The preliminary report of the CMT and the INE also includes data about Internet access in homes. In this respect, the conclusions are very similar to the previous ones, since Extremadura occupies the penultimate position in the list only standing before Castilla La Mancha, which is four percentage tenths behind. According to the study, only eight out of one hundred families in the region have access to the Internet, compared to 26 in Madrid, 24 in Cataluña or the 17.4% national average.

As logic consequence of this indicator, Extremadura and Castilla La Mancha share, with equal percentage, the last position in the national classification of Internet use. The survey points out that only the 10.8 of adults in the region affirm to have used the Internet in the three last months. The rate is almost eight points below the national average, and far away from Madrid which leads the list with a rate of the 26%; that is to say, *the 11% of people in Extremadura have used the Internet in the last three months whereas the national average reaches the 19%.*

This dynamics only changes when talking about the shopping expenditure made through the Internet. In this point, Extremadura abandons the last positions of the classification and occupies position 10 among the 17 Spanish regions. Of the seventeen regions, Extremadura is the tenth region that spends more in e-mail (59 euros per month).

The surveys that have been developed in 815 homes all over the region allow concluding that people from Extremadura that use electronic commerce in their purchases have spent an average of 178 euros in the last three months, that is, 59 euros per month. This rate places Extremadura almost ten points below the national average, but before several regions that surpass Extremmadura in other indicators such as Navarra, Cantabria, Cataluña, Asturias, or Castilla y León.

## The European alternative to Microsoft

Contrasting with these cruel data, Extremadura is trying to extend the Information Society and, in order to reduce software costs, aims at replacing Microsoft as protagonist in the software industry with Linux. This substitution involves a huge saving.

It is comforting for someone from Extremadura to read on the first page of *The Washington Post* that Extremadura government, with a very modest budget, is changing all computers in the region to Linux and is developing Linux based programmes to be used in accounting, education, clinical histories and harvest statistics in order to distribute them to people from Extremadura for free. The Economic Commission of the European Union is following and promoting this example which has even called New Zealand Government's attention.

More than 10,000 computers have already changed their system and there are more than 100,000 programmed changes for the next year. Organizations consider the campaign as an economical way of allowing people from this needed region to have access to technologies.

*Ariana Eunjung Cha, editor of The Washington Post, wrote on the 3rd of December of 2002: "Extremadura is closely watched by Microsoft and Linux enthusiasts in order to check how the transition develops".*

So far, many people from Extremadura are using both operative systems to avoid having to deal with an outside world that trusts in Microsoft. But the campaign suggests that the region could play an important role when "challenging" the expansion of the software company, since states are careful not to depend too much on the skill of one single American corporation.

Linux is one of the different operative systems that are freely available on the Internet. Programmers of all over the world united to create the original programme, and then private and other companies adapted the work to their own purpose.

Extremadura's regional government paid to a local company 180,000 $ to elaborate a free software set. The resulting disc contains a set of programmes that include an operative system, a word processor, spreadsheet, and other applications. Organisers called their version *Linex*, combining Linux and Extremadura. The software has become so popular that has been downloaded more than 55,000 times from www.linex.org by people from other Spanish regions.

Government also invested in a development centre that is creating software for accounting, tracking patients in hospitals and management, which will be delivered by the agency free. So far, government has produced 150,000 discs with the software and they are being distributed in schools, stores, community centres, and also as extra material with newspapers. They have also been shown in television commercials pointing out the benefits of free software.

Others are noting this down. A Spanish computer science magazine began to distribute the Linux disc that Extremadura developed and an editor is going to release a book about this effort. Several of the region's most important computer distributors have agreed to preinstall Extremadura Linux instead of Windows.

Nowadays there are almost seventy laws or proposals to be approved in two dozens countries that would force or at least encourage governments to use this software. This year, Germany said that it signed a contract to use Linux in many of its government systems; other important economic potencies such as United Kingdom, China, Italy, and Brazil are studying the issue.

Microsoft has often argued that free software is inferior to commercial products because it requires a high level of experts to make it work.

## 5.4 Research design and procedures

This research has studied adult participation in continuing education and training. It was essentially designed to identify and analyse the factors associated to technical workers' participation in continuing VET activities and to understand how they influence technical workers' decision to participate in these activities. For this reason, participation in continuing VET activities was selected as criterion (dependent) variable. The predictive (independent) variables were the factors assumed to be associated to technical workers' participation in continuing VET offerings (Tab. 1).

| Classes | Variables |
|---|---|
| **Social background & social roles** | Ascribed social roles<br>Achieved Social roles<br>Experience & activities<br>Resources & resource access |
| **Personality & intellectual flexibility** | Psychological functioning<br>Beliefs & values<br>Intellectual activities |
| **Attitudinal dispositions toward to** | Learning & education<br>Profession & job<br>Training entities<br>Training activities |
| **Retained information** | Level of participation in training<br>Satisfaction with training<br>Satisfaction with schooling<br>Self-perception as student |
| **Situational factors** | Marketing of training<br>Participation barriers<br>Job characteristics |
| **Criterion variable** | Participation in continuing education |

*Tab. 1 The ISSTAL model: List of variables*

The study has been theoretical framed by the ISSTAL model of social participation and has used a *cross sectional survey* approach which will be complemented lately by a set of case studies[22] to further understanding the participation factors. In the survey phase, data was collected through an instrument specifically developed for the study from two samples drawn from two populations (Tab. 2): all technical workers employed by small and medium companies (SMEs) of the building and ICT sector located in Badajoz.

| Sample | Badajoz |
|---|---|
| **Building** | 97 |
| **ICT** | 76 |
| **Total** | 173 |

*Tab. 2 Sample*

The predictive factors (independent variables) of the participation in continuing education (criterion variable) were framed by six classes (Cookson, 1986):

- Class 1 - External context
- Class 2 - Social background and social roles
- Class 3 - Personality and intellectual flexibility
- Class 4 - Attitudinal dispositions
- Class 5 - Retained information
- Class 6 - Situational factors

The ***External context*** is related to characteristics of the local where continuing education is taking place. This variable has not been taken into consideration for the present phase of the study. The ***Social background & social roles*** concern individuals' ascribed and achieved social roles, life and professional experience and activities, and resource availability

and access to resources. ***Personality and intellectual flexibility*** includes factors of psychological functioning, personality characteristics, and intellectual capacities of individuals. ***Attitudinal dispositions*** frames factors concerning individual's values, attitudes, expectations and intentions. ***Retained information*** includes variables related to individuals' learning orientation, beliefs, and knowledge they have about learning. The ***situational factors*** are related to temporary situations and aspects that may be associated to participation in learning activities.

In the present research, **adult participation in continuing education,** the criterion variable, is defined as the technical workers' involvement in purposive and deliberate learning through continuing education and training programmes.

The instrument, based on another previously developed by the first author, was elaborated taking into consideration the ISSTAL model. It was organised into five parts: (1) **Social background & social roles** was composed of five groups of indicators: a) *Ascribed social roles*, b) *Achieved social roles*, c) *Experience & activities*, d) Physical deficiencies, and d) *Resources and resource access*; (2) **Personality and intellectual flexibility** was subdivided into three scales: a) *Psychological functioning*, b) *Beliefs and values*, and c) *Intellectual activities*; (3) **Attitudinal dispositions** included items collecting three types of attitudes toward: a) L*earning and education*, b) *Profession and job*, and c) *Training conditions;* (4) **Retained information** was organised into two aspects: a) *Level of participation in training activities*, b) *Satisfaction in relation to experienced training activities*; and (5) **Situational factors** comprised three aspects: a) *Marketing of training activities*, b) *Awareness of limitations and barriers*, and c) *Awareness of professional factors*. Most of the variables were measured by scales of multi 5-point Likert-type items developed along the domain of each construct.

The instrument was pre-tested and evaluated in terms of validity and reliability. Validity was estimated by two ways: (1) Content validity (Multi-item scale and instrument) through a panel of judges (experts), and (2) Discriminant validity through Spearman correlation (Tab. 3). Results suggest that all of the multi-item scales have discriminant validity. The Instrument and scale reliability was examined by the Cronbach's alpha coefficient based on the data from the pre-test conducted with 23 technical workers who were not a part of the sample (Tab. 4). Alpha coefficient for all scales is near to 0.70 cut off recommended by Nunnally (1978).

| Scales | Personality | Attitude | R. Information | Situational |
|---|---|---|---|---|
| Personality | 1.0000 | | | |
| Attitude | 0.533 | 1.0000 | | |
| R. Information | 0.185 | 0.368 | 1.0000 | |
| Situational | 0.236 | 0.135 | 0.291 | 1.0000 |

*Tab. 3 Discriminant Validity of Multi-item Scales*

In the case study phase, data will be collected by semi-structured interviews and non-participant observation from one case selected from each region according to specific criteria to be established during the first phase.

| Scales | Alpha Pre-test | Alpha Final |
|---|---|---|
| Personality and Intellectual Flexibility | 0.8234 | 0.7589 |
| Attitudinal Dispositions | 0.6197 | 0.7552 |
| Retained Information | 0.4822 | 0.5420 |
| Situational factors | 0.7519 | 0.6162 |

*Tab. 4 Scale Reliability*

Data analysis for this survey research has comprised three phases. Firstly, each class dimension was submitted to *principal (categorical & non-categorical) component factorial analysis* to identify factors influencing technical workers' participation in continuing education activities. Secondly, relationships between the different assumed predictive factors and the criterion (dependent) variable (participation) were estimated by *categorical multiple regression analysis* framed by a *path analysis strategy*. All of the statistical analyses were performed at 0, 05 level of significance.

## 5.5 Analysis and discussion of results

In general, findings from statistical strategies (factorial analysis and multiple regression) appears to indicate that the ISSTAL model, with some adjustments, applies to the building and ICT (Badajoz) realities. Nevertheless, some minor differences appear to be in the dimensions integrated in each class of factors. For this reason, it can be said that the ISSTAL model appear to be a useful theoretical frame for understanding how and why technical workers from the building and from ICT sector in Badajoz (Extremadura) participate (or not) in continuing training offerings.

### 5.5.1 The building Sector of Badajoz

#### Characteristics of the Target Group

The building technician's population of Badajoz region is characterized by being a population where gender discrimination is visible. In fact, that population is constituted by a much higher proportion of men (91%) than of women (8%). However, there is not a significant difference between men and women in terms of participation in CVET (v=0.067; sig=0.93). The majority of the technicians are aged between 25 and 54 years old. However, the 25-34 class of age is the most representative (43.3%). Although significant at 0.01 level, the value of the Sommers'd measure of association (somers´d= -0.338; sg=0.00) between age and participation indicates that age does strongly and inverse influences participation in CVET.

More than 51.5% of the building technicians working in the Badajoz companies have lived until 18 years old in villages and 42.3% in small city. According to Somers'd measure of association, that fact does not have a significant influence in participation of building technicians in CVET. This probably indicates that the majority of the technicians working in the Badajoz's building companies come from the rural areas of Extremadura region.

Concerning formal education, the majority of the building technicians have finalised the Secondary education (74.2%). According to results obtained from Somer's d statistic (V=0,185;sg=0.011), level of formal education positively, although moderately, influences

level of participation of building technicians in CVET.

The majority of the building technicians have a family income below 2000 Euros (73.2%), live in their own home (68.0%), and have their own car (22.7%). According to statistical measures of association based on $\chi 2$ statistic, none of these dimensions appear to be associated to level of participation in CVET.

All the access to learning and culture resources are very low. They also appear to be directly associated to level of participation: access to theatre (V=0.446; sig=0.000) and access to library (V=0.320, sig=0.020).

## The participation model

In relation to Badajoz, taken into consideration results for each class dimension of the ISSTAL model, findings seems to indicate that *images of learning* (0.7298), *intellect* (0.2277) are the predictor class dimensions that most influence participation of building technicians in continuing vocational education and training activities.

Taking into consideration results obtained from a more detailed analysis (Tab. 5), some additional conclusions can be drawn. Within the **ascribed roles**, on one hand, *gender* has not a significant (direct or indirect) effect on PCVET; on the other hand, *age* (- 0.4399) influences significant and negatively participation and *size of living local until age of 18 years* (0.3059) have a significant positive effect over PCVET. From these results, one can say that the negative effect of the *ascribed roles* comes from *age*'s effect. Concerning **achieved roles***, social class* (0.2753), and *Formal education* (0.1985) indicator presents the major significant effect on PCVET. It is also worthy of mentioning the effects of the *Professional level* (0.2677), *Formal education* (0.1985).

In relation to **experience dimension***,* both indicators (C*haracteristics of job tasks* and *Type of job*) significant and positively effects Participation. In relation to **Physical deficiencies** considered in the instrument, only the *visual capacities* (0.0623), *Earing capacities* (0.1058), *Respiratory capacities* (0.2387) and *Other Physical capacities* (0.1095) indicators have presented a significant effect on PCVET. Concerning **Resources**, *Access to Theather* (0.4350) and *Access to training* (0.3773) were the indicators with the major effect on Participation. However, Car ownership (0.1492) and *Access to Library* (0.1481) have also a relatively relevant effect on PCVET.

| Predictor class | Dimensions | Indicators | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|---|
| | | | | Beta | Sig. | Beta | Sig. |
| Social background & Social roles (1) | Ascribed roles | Gender | 0.085 | 0.051 | NS | 0.034 | NS |
| | | Age | -0.440 | -0.438 | S | -0.002 | S |
| | | Living local until 18 years | 0.306 | 0.226 | S | 0.080 | NS |
| | Achieved roles (1) | Civil status | -0.087 | -0.112 | NS | 0.026 | NS |
| | | Children | 0.019 | -0.013 | NS | 0.032 | NS |
| | | Formal education | 0.199 | 0.216 | S | -0.018 | NS |
| | | Profession (level) | 0.268 | 0.259 | S | 0.009 | NS |

| Predictor class | Dimensions | Indicators | Total Effect | Direct Effect | Indirect Effect | Predictor class | Dimensions |
|---|---|---|---|---|---|---|---|
| Social background & Social roles (2) | Achieved roles (2) | Condition face to work | -0.333 | -0.192 | S | -0.141 | S |
| | | Organisation* | -0.236 | -0.221 | S | -0.015 | NS |
| | | Professional life cycle | -0.067 | -0.142 | NS | 0.075 | NS |
| | | Self-reported social class | 0.275 | 0.205 | S | 0.070 | NS |
| | Experience | Characteristics of job tasks | 0.158 | 0.232 | S | -0.074 | NS |
| | | Type of job (routine/no routine) | 0.355 | 0.071 | NS | 0.013 | S |
| | Physical Deficiencies. | Visual deficiencies | 0.084 | 0.073 | S | -0.011 | NS |
| | | Hearing deficiencies | 0.106 | 0.106 | NS | -0.002 | NS |
| | | Respiratory deficiencies | 0.239 | 0.182 | NS | 0.057 | NS |
| | | Renal | 0.093 | -0.107 | NS | -0.014 | NS |
| | | Oral deficiencies | 0.081 | 0.106 | NS | -0.026 | NS |
| | | Other physical deficiencies | 0.110 | 0.117 | NS | -0.008 | NS |
| | | None physical deficiencies | 0.006 | 0,001 | NS | 0,005 | NS |
| | Resources | Family income | 0.045 | 0.049 | NS | -0.004 | NS |
| | | Home ownership | -0.127 | -0.160 | NS | 0.033 | NS |
| | | Car ownership | 0.149 | 0.107 | NS | 0.042 | NS |
| | | Access to museums | -0.037 | -0.054 | NS | 0.017 | NS |
| | | Access to theater | 0.435 | 0.368 | S | 0.066 | NS |
| | | Access to library | 0.148 | 0.132 | NS | 0.016 | NS |
| | | Access to Festivities | -0.087 | -0.112 | NS | 0.026 | NS |
| | | Access to training | 0.377 | 0. 043 | S | 0.073 | NS |
| Personality & Intellectual flexibility | Psycho. Functioning, Beliefs & Values | Personal | 0.182 | 0.130 | NS | 0.052 | NS |
| | Intellectual flexibility | Intellect | 0.228 | 0.215 | S | 0.013 | NS |
| Retained information | Images of learning experiences | Images | 0.730 | 0.087 | S | 0.043 | S |
| Attitudinal dispositions | Attitudes to education & learning, to profession, to training conditions | Attitude | 0.038 | 0.097 | NS | -0.059 | S |
| Situational aspects | Marketing, Awareness of limitations, Awareness of professional factors | Situational | 0.186 | 0.186 | S | | |

*Tab. 5 Badajoz (Extremadura). Path Analysis: table of effects*

## Feeling about education and learning

Taken into consideration results in the feeling about education and learning (Tab. 5), about jobs and training entities, finding seems to indicate that *trainers, apart from giving information about the subject-matter, should use methods that facilitate learning* (Mean Rank of Friedman test=19.46; Sg=0.000), *trainers must have the needed qualifications to give training* (Mean Rank of Friedman test=18.32; Sg=0.000), and *the training programs should be held near one's place of work or one's house (less than 10 Km)* (Mean Rank of Friedman test=17,72; Sg=0,000) are the best considered for the participation of building technicians in continuing vocational education and training activities.

| Feel about education and learning | Mean Rank |
|---|---|
| I like to study. | 11,46 |
| The best way for people to learn is by participating in training programs. | 14,02 |
| Participating in training programs is a good way to occupy one's free time. | 13,90 |
| Going back to school as an adult is, in my opinion, an embarrassing situation. | 8,64 |
| Education for adults is as important as education for children. | 15,42 |
| I can learn everything I want, without participating in training programs. | 9,46 |
| Participating in training programs brings me some benefits. | 13,42 |
| In what concerns the company where you work, you feel | 16,86 |
| If the company where you work allowed you to participate in training programs, you would be | 17,38 |
| I will only make the decision of participating in training programs after having detailed Information on them. | 17,46 |
| I am selective as far as the institution promoting the training programs is concerned. | 12,78 |
| It is important that, when asked, the training entities will make available some personnel to Give information on the training programs. | 17,38 |
| It is nice to attend training in the summer months. | 8,13 |
| Trainers must have the needed qualifications to give training | 18,32 |
| Trainers, apart from giving information about the subject-matter, should use methods that Facilitate learning. | 19,46 |
| In training programs, the trainer should limit himself to teaching about the subject-matter | 11,60 |
| There should be only 15 trainees in the training programs. | 16,87 |
| The training programs should be held near one's place of work or one's house (less than 10 Km). | 17,72 |
| It would be better if training programs were held at universities. | 9,87 |
| It would be better if training programs were held in rooms rented in the city. | 10,08 |
| It would be better if training programs were held in hotels, restaurants, etc. | 7,43 |
| It would be better if training programs were held in the company where you work. | 15,59 |
| In my opinion, it is important for the training entities to be equipped with a bar/canteen/ socialising room. | 10,89 |
| It would be better if training programs were held in labouring hours. | 13,58 |
| Training programs should have an average duration of one month. | 12,36 |
| Training programs should have an average duration of a quarter of a year. | 10,93 |

*Tab. 6 Feel about education and learning of the building technicians working in the Badajoz companies*

On the other hand, It would be better if training programs were held in hotels, restaurants, etc. (Mean Rank of Friedman test=7.43; Sg=0.000), It is nice to attend training in the summer months (Mean Rank of Friedman test=8.13; Sg=0.000) and going back to school as an adult is, in my opinion, an embarrassing situation (Mean Rank of Friedman test=8.64; Sg=0.000) are the worst considered for the participation of building technicians in continuing vocational education and training activities.

### 5.5.2 The ICT Sector of Badajoz, Extremadura

#### Characteristics of the Target Group

The same of the building technician's population, the studied population of ICT technicians is characterised by being a younger population where gender discrimination is visible. In

fact, that population is constituted by higher proportion of men (75%). However, there is not a significant difference between men and women in terms of participation in CVET. That means that the gender characteristic does not influence directly ICT technicians' participation in CVET (Cramer's V =0.216; sig=0.313). The majority of the ICT technicians are aged between 25 and 34 years old. Although significant at 0.05 level, age of the ICT technicians appear to not have a strong direct effect in participation in CVET. The ICT technicians working in Badajoz companies have lived until 18 years old in small and big cities(46.1% and 30.1% respectively). According to Cramer´s (V=0.127; sig=0.931) measure of association, that fact does not have a significant direct influence in participation of the ICT technicians in CVET.

Being a younger population, almost half of the ICT technicians are single (43.4%) and the other half are married (52.6) and have less than 2 children (94.7%). According to Phi and Cramer's V coefficients, marriage (V=0.455; sig=0.000) is significantly associated to participation in CVET of the ICT technicians. Concerning formal education, the majority of the ICT technicians have finalised either the secondary education (65.8%) and higher education (34.2%). According to results obtained from Somer's d, level of formal education does not influence level of participation of ICT technicians in CVET. On one hand, this is why most of the ICT technicians have a professional level of *technician* or *higher technician*. On the other hand, this means, that their technical skills have been acquired through formal education.

The majority of the ICT technicians have a family income between 1000 and 3000 Euros (55.3%), lives in their own home (82.9%). According to statistical measures of association based on $\chi 2$ statistic, only have their own home appear to be directly associated to level of participation in CVET (V=0.357; sig=0.004).

Except for festivities, all of the other access to learning resources presents a relatively higher value comparing to the ones verified for the building technicians. In all of the access dimensions appear to not be directly associated to level of participation.

## The participation model

Taking into consideration results obtained from analysis (Tab. 7), some additional conclusions can be drawn. Within the **ascribed roles**, on one hand, *gender* has not a significant (direct or indirect) effect on PCVET, on the other hand, *age* (-0.0200) influences significant and negatively participation and *size of living local until age of 18 years* (0.0302) have a significant positive effect over PCVET. Concerning **achieved roles**, *Condition face to work* (0.6181) and *Self-reported social class* (0.4776) are the indicators with the major significant effect on PCVET. The *Organisation* also presents a relevant value but only significant in terms of direct effect (0.181). In relation to **experience dimension**, *Type of job* (0.8916) is the indicator with the major significant effect on PCVET. From the nine **Physical deficiencies** considered in the instrument, have presented a significant effect on PCVET. In relation to **Resources**, *Family income* (0.6295) was the indicator with the major effect on Participation. However, *Home ownership* (0.5082) and *Access to festivities* (0.5456) has also a relatively relevant effect on PCVET. On the other hand, *Intellectual activities* (0.9414), *Psychological functioning, Beliefs & values* (0.9168) and *images of learning* (0.5662) are the predictor class dimensions that

most influence participation of ICT technicians in continuing vocational education and training activities.

| Predictor class | Dimensions | Indicators | Total Effect | Direct Effect | | Indirect Effect | |
|---|---|---|---|---|---|---|---|
| | | | | Beta | Sig. | Beta | Sig. |
| Social back-ground & Social roles | Ascribed roles | Gender | -0.250 | 0.126 | NS | -0.376 | NS |
| | | Age | -0.020 | 0.224 | S | -0.244 | NS |
| | | Living local until 18 years | 0.030 | 0.076 | NS | -0.046 | NS |
| | Achieved roles | Civil status | -0.307 | 0.228 | NS | -0.535 | S |
| | | Children | -0.014 | -0.007 | NS | 0.007 | S |
| | | Formal education | 0.079 | 0.025 | NS | 0.054 | NS |
| | | Profession (level) | 0.190 | -0.134 | NS | 0.324 | NS |
| | | Condition face to work | 0.618 | 0.215 | NS | 0.403 | NS |
| | | Organisation | 0.101 | 0.181 | S | -0.080 | NS |
| | | Professional life cycle | 0.176 | 0.152 | NS | 0.024 | NS |
| | | Self-reported social class | 0.478 | 0.144 | NS | 0.334 | NS |
| | Experience | Characteristics of job tasks | -0.219 | -0.157 | NS | -0.062 | NS |
| | | Type of job (routine/no routine) | 0.892 | 0.367 | S | 0.525 | S |
| | Physical Deficiencies. | Visual deficiencies | 0.623 | 0.029 | NS | 0.594 | NS |
| | | Motorical deficiencies | 0.103 | 0.016 | NS | 0.087 | NS |
| | | Hearing deficiencies | 0.361 | 0.341 | NS | 0.020 | NS |
| | | Blood circulation | -0.565 | -0.189 | NS | -0.376 | NS |
| | | Respiratory deficiencies | 0.335 | 0.011 | NS | 0.324 | NS |
| | | Oral deficiencies | -0.444 | -0.291 | NS | -0.153 | NS |
| | | Other physical deficiencies | -0.342 | 0 | NS | -0.342 | NS |
| | | None physical deficiencies | 0.655 | -0.127 | NS | 0.782 | NS |
| | Resources | Family income | 0.630 | 0.186 | NS | 0.444 | NS |
| | | Home ownership | 0.508 | 0.329 | S | 0.179 | NS |
| | | Car ownership | -0.206 | -0.138 | NS | -0.068 | NS |
| | | Access to museums | 0.370 | 0.046 | NS | 0.324 | NS |
| | | Access to theater | 0.092 | -0.115 | NS | 0.207 | NS |
| | | Access to library | 0.066 | -0.139 | NS | 0.205 | NS |
| | | Access to Festivities | 0.546 | 0.065 | NS | 0.481 | NS |
| | | Access to training | 0.028 | 0.099 | NS | -0.071 | NS |
| | | No Previous | 0.126 | 0.243 | NS | 0.167 | NS |
| Personality & Intellectual flexibility | Psycho. Functioning, Beliefs & Values | Personal | 0.917 | 0.210 | S | 0.707 | S |
| | Intellectual flexibility | Intellect | 0.941 | 0.447 | S | 0.494 | S |
| Retained information | Images of learning experiences | Images | 0.566 | 0.327 | S | 0.239 | S |
| Attitudinal dispositions | Attitudes to education & learning, to profession, to training conditions | Attitude | 0.475 | 0.233 | S | 0.242 | S |
| Situational aspects | Marketing, Awareness of limitations, Awareness of professional factors | Situational | 0.307 | 0.307 | S | | |

*Tab. 7 Badajoz (Extremadura). Path Analysis: table of effects*

## Feeling about education and learning

Taken into consideration results in the feeling about education and learning (Tab. 8), about jobs and training entities, finding seems to indicate that *trainers, apart from giving information*

*about the subject-matter, should use methods that facilitate learning (*Mean Rank of Friedman test=19.65; Sg=0.000), *if the company where you work allowed you to participate in training programs, you would be* (Mean Rank of Friedman test=19.34; Sg=0.000), and *trainers must have the needed qualifications to give training* (Mean Rank of Friedman test=17.38; Sg=0.000) are the best considered for the participation of ICT technicians in continuing vocational education and training activities.

On the other hand, going back to school as an adult is, in my opinion, an embarrassing situation (Mean Rank of Friedman test=7.36; Sg=0.000), if would be better if training programs were held in hotels, restaurants, etc (Mean Rank of Friedman test=8.33; Sg=0.000) and it is nice to attend training in the summer months. (Mean Rank of Friedman test=9.21; Sg=0.000), are the worst considered for the participation of ICT technicians in continuing vocational education and training activities.

| Feel about education and learning | Mean Rank |
|---|---|
| I like to study. | 13,33 |
| The best way for people to learn is by participating in training programs. | 15,89 |
| Participating in training programs is a good way to occupy one's free time. | 15,06 |
| Going back to school as an adult is, in my opinion, an embarrassing situation. | 7,36 |
| Education for adults is as important as education for children. | 16,27 |
| I can learn everything I want, without participating in training programs. | 10,00 |
| Participating in training programs brings me some benefits. | 15,65 |
| In what concerns the company where you work, you feel | 15,66 |
| If the company where you work allowed you to participate in training programs, you would be | 19,34 |
| I will only make the decision of participating in training programs after having detailed Information on them. | 16,55 |
| I am selective as far as the institution promoting the training programs is concerned. | 12,94 |
| It is important that, when asked, the training entities will make available some personnel to Give information on the training programs. | 16,76 |
| It is nice to attend training in the summer months. | 9,21 |
| Trainers must have the needed qualifications to give training | 17,38 |
| Trainers, apart from giving information about the subject-matter, should use methods that Facilitate learning. | 19,65 |
| In training programs, the trainer should limit himself to teaching about the subject-matter | 10,10 |
| There should be only 15 trainees in the training programs. | 15,51 |
| The training programs should be held near one's place of work or one's house (less than 10 km). | 17,31 |
| It would be better if training programs were held at universities. | 9,64 |
| It would be better if training programs were held in rooms rented in the city. | 9,69 |
| It would be better if training programs were held in hotels, restaurants, etc. | 8,33 |
| It would be better if training programs were held in the company where you work. | 13,56 |
| In my opinion, it is important for the training entities to be equipped with a bar/canteen/ socialising room. | 10,14 |
| It would be better if training programs were held in labouring hours. | 13,89 |
| Training programs should have an average duration of one month. | 11,54 |
| Training programs should have an average duration of a quarter of a year. | 10,24 |

*Tab. 8 Feel about education and learning of the ICT technicians working in the Badajoz companies*

## 5.6 Final considerations

Results from analyses indicate that the ISSTAL model may serve as theoretical frame to study and analyse relationships between a set of characteristics and aspects and participation in training activities of the technical workers of Badajoz´s building and of ICT companies. On one hand, the analysed dimensions were found to be related to participation in continuing education offerings. On the other hand, number and nature of class predictive factors and their dimensions, though slightly different from the ones posited in the ISSTAL model, do not suggest the need for major changes in the model. Those differences may have resulted from the different interpretation and perspective concerning dimensions and their indicators and/or characteristics of the context, the first class of variables considered in the ISSTAL model.

Concerning findings for each class sector, *Intellectual activities, Psychological functioning, Beliefs & values*, *images of learning* and *Access to training* are the predictor class dimensions that most influence participation in continuing vocational education and training activities.

For this reason, public training institutions should implement strategies to demonstrate the importance of training for professional and company development. They also should implement strategies focusing on the need for training of quality. In addition, it is essential not only to provide training for updating technical skills but also to developing a set of more transversal key skills such as problem solving, communication, management and ICT skills. Companies should make efforts not only to reduce participation barriers but also to implement incentive strategies emphasising the role of training for job performance.

The fact of the *images of learning*, *intellectual flexibility*, and *experience* dimensions may suggest to promote strategies for improving self-directed learning and learning to facilitate the learning of the others. On the other hand, the relevant direct effect of *retained information* and *attitudes* on CVET may indicate a need for promoting different strategies for learning how to organise knowledge and understand how important lifelong learning for development of the technical workers is. For this reason, it is vital to develop strategies for promoting and facilitating self-learning, mainly through e-learning strategies, of the technical building and ICT technicians.

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# 6 United Kingdom

*Alan Brown*

## *An investigation into technical workers' participation in continuing vocational education, training and learning in England*

Continuing vocational education and training (CVET) for those in work or craft or technician level work-related training for those without work confer benefits in terms of earnings and employment prospects. It may be that such training also confers wider 'employability' benefits in relation to obtaining work and/or sustaining employment. Hillage and Pollard (1998) defined employability with reference to:

- the ability of an individual to get a job;
- their subsequent ability to retain employment;
- 'independence' in the labour market (a measure of the factors which enable an individual to make choices in their employment situation);
- the quality of work.

Viewed in this light CVET for technical workers (in sectors like engineering and IT) can be seen in the context of dynamic and uncertain labour markets as offering individuals the chance to increase their human capital, for example through updating existing skills or developing new skills *via* training. Skill development in such contexts is often key to maintaining employability over a long period. However, to view participation or non-participation in such training as necessarily decisive overlooks the fact that, at least in the UK context, most skill development for technical workers takes place outside formal training contexts. Much learning and development takes place while working. Additionally, it may be that it is social capital, developed through participation in work-related networks, that helps individuals sustain their employability. Certainly, both in engineering and IT those individuals whose work regularly took them to other workplaces developed strong networks as well as experiencing challenging work in a variety of contexts, a process that honed their skills in a number of respects. In the UK labour market technical workers were likely, especially early in their career, to change jobs quite frequently and this also led to considerable skill development, including the development of tacit skills. Such mobile workers were also more likely as a consequence of their mobility to take part in CVET activities, but these were often short duration induction training and/or health and safety training. Finally, the employment of graduates in many technical positions in the UK meant that what they often needed to become more effective at work was practical experience gained while working rather than formal skills or knowledge updating through formal training programmes.

For all the above reasons, participation in formal CVET is only one of a number of ways of for technical workers to develop their skills and in the UK context it makes sense to look at the full range of learning experiences of technical workers. In this way it should be possible to identify the different strategies and combinations of strategies used by those technical workers actively committed to updating their skills compared to those who adopt a more passive approach. This means that it is the participation in substantive learning that is the

key objective. Participation in CVET is one means of achieving this goal, but it just one and certainly not even the main means of doing so. Participation in CVET on its own is therefore in the UK context a poor proxy for engagement in substantive learning.

Methodologically however, trying to investigate the extent of participation in substantive learning at, for and through work by surveys is fraught with difficulties. Crucially, of course, it depends upon the questions asked and the extent to which respondents recognise certain activities at work as learning when 'it is part of their normal work activities.' The Learning and Training at Work Survey, National Skills Survey and the National Adult Learners Survey approached these matters in slightly different ways and illuminated different parts of the picture of the extent of learning at work. For this reason, in the UK context, it was felt it might be more helpful to carry out some secondary analysis and synthesis of findings in this area (from comprehensive national surveys) rather than contributing another employee survey, that would be necessarily much smaller scale and possibly unrepresentative.

Until recently the UK has taken an individualist approach to participation in continuing vocational education and training and lifelong learning. With the publication of the National Skills Task Force reports and subsequent analyses, for example by the Cabinet Office and the Department of Trade and Industry (DTI), however, the attention has shifted to a focus upon improving business performance and regarding promotion of training as a second or even third order issue. From the point of view of the Participa project it was decided that it would be useful to have this more strongly contextual perspective on participation in CVET and learning represented. This would also help to draw out the implicit tension between the individualist project objectives designed around improving participation rates and those focused upon improving business competitiveness. For this reason it was also decided that in the UK context it would be useful to draw on the evidence generated from employers skills surveys upon the extent to which further training was necessary to achieve business objectives. In particular, it has been possible to draw upon a major survey of almost 1700 employers in Coventry and Warwickshire conducted in 2002.

As well as utilising extensive national and regional surveys for the PARTICIPA project data analysis, it has also proved possible to gather interview and focus group data. All the data collected can be analysed using the ISSTAL dimensions as an organising frame. The focus of the data collection has been upon engagement in substantive learning rather than in participation in formal training per se. In this way it should be possible to identify a more multi-layered approach to barriers to work-related learning for individuals and to consider a wider range of ways in which effective work-related learning may be promoted, including for technical workers working in small and medium size enterprises.

Sixty interviews with technical workers with varying levels of responsibility who are working in the engineering or IT industries or who use substantive ICT skills in their work in other contexts have been completed. In addition in a subsequent phase of the work the full analysis of interview data will be combined with data from focus groups and company case studies. Crucially, from these complementary data sources it should be possible to identify not only factors influencing technical workers' participation in CVET and learning, but also to generate exemplars of the effectiveness of different approaches and combinations of continuing vocational learning. This should also highlight the interaction between formal

and informal approaches to learning, skill development and knowledge creation. However, that is for the future and for the moment we will concentrate upon analysis of data drawn from surveys together with some initial analysis of data drawn from interviews and focus groups. First, however, it will be important to present some contextual background on work in the engineering and ICT industries.

## *6.1 Contextual background*

### 6.1.1 Engineering

Small and medium sized enterprises (SMEs) in engineering face intense pressures resulting from the strategies, tactics and operational methods of the large companies that dominate their markets, particularly where these are linked to supply chain restructuring. Yet stresses on SMEs and operational demands force them to deal continually with immediate tasks and problems, and they generally operate within extremely limited time horizons, leaving them with few opportunities to develop an overall strategic approach to their business. In the PARTICIPA project one focus of the engineering study will be upon organisations in advanced supply systems in the automotive industry. The automotive industry has been important in the (West Midlands) regional economy, and Coventry in particular, since early in the twentieth century. The engineering tradition in Coventry going back still further, and for a long period of time it was considered to have the greatest concentration of highly skilled labour in engineering in the country. For example, toolmakers in Coventry were the highest paid in the country and for many years the 'Coventry toolroom agreement' set the benchmark for wage negotiations in the engineering industry as a whole.

The strategic and operational contexts of SMEs have been influenced by the changing patterns of innovation within supply systems for complex products in the automotive, aerospace and other engineering industries in the last decade. Recent processes of 'de-integration' in large companies have been coupled with the development of stronger links in 'supply chains'. They are generally founded on large firm control that is facilitated by intensive use of information and communications technologies and is used to achieve tight co-ordination over all stages of production. The changing contextual background of the engineering supply chains gives an indication of the extent to which continuing education, training and learning in the engineering industry needs to be considered across companies as well as within them.

Competitive pressures, including those coming from manufacturers asking for year on year cost reductions from suppliers, are thus particularly acute for the approximately 7,000 companies in the UK automotive sector. Many companies are poorly equipped to respond because they lack training-oriented management cultures. Often, the management culture is ill suited to recognising the scale of change needed for survival or to initiating the responses required for survival. The scale of the challenge can be indicated by the main capabilities now increasingly sought in suppliers by the large companies. These include consistent product quality; manufacturing flexibility; continuous improvements in production methods to meet regular customer 'cost-downs'; inter-organisational capabilities to meet increasing pressure for tight integration and co-ordination of production, product design and de-

velopment and other functions across the automotive supply chain; multi-skilled working; capabilities for using e-commerce for business to business interactions and transactions across the supply chain; and the development of new management capabilities attuned to these conditions.

### Flexibility in forms of work organisation

The engineering industry extends beyond the automotive industry, however, and it is important to get a sense of what is happening to the organisation of work across the engineering industry as a whole. There is great variation and some employers have embraced quite radical change. They have been changing roles and responsibilities and experimenting with different patterns of work organisation (including team working, manufacturing cells and varying skill mixes). In some cases the emphasis is more work intensification rather than high performance. Other companies are shifting from direct manufacturing to provision of engineering services and this requires changing skill sets for many employees that remain with the company.

However, there remain enormous variations in the degree of skill required of workers in different workplaces and companies. One significant difference is between companies where skilled workers are a very small minority and production is largely routine and those where more highly skilled workers play more of a role in production, support and related activities. There seems to be a clear divide between those cases where most workers are being given more autonomy and responsibility and those where the manufacturing process is being even more tightly controlled, with an emphasis upon cost reduction.

There is a strong demand from employers for skilled workers with 'modern' skill sets, including abilities to work in teams and communicate effectively. This is despite the continuing overall reductions in the numbers employed in engineering. All companies have been introducing greater flexibility in work and expect staff to accept resulting changes in patterns of work organisation. The drivers of this in some cases were because of a switch to team working, while in others it was due to an attempt to improve manufacturing practice through a focus upon continuous improvement (and on quality, costs and delivery). In some cases there was an explicit attempt to follow Japanese 'best practice' in this area, with an emphasis upon machine turn-round times, 'right first time' and so on. Changes are being driven by a desire to improve competitiveness and major manufacturers themselves have been pressurising their own suppliers, sometimes through the use of very aggressive year on year cost-downs. Flexibility in work organisation has been a major goal of employers in engineering, although there are major differences in how companies are trying to achieve this.

### Supply and demand for intermediate level technical skills in the engineering industry

In engineering it is also important to get a sense of what is happening to supply and demand of intermediate level technical skills across the industry as a whole. Jobs performed by workers with intermediate level technical skills in engineering range from those requiring very specific in-depth technical knowledge and expertise to others where a broader technical ability is needed alongside good interpersonal skills. One of the most striking features is

the increased competition occurring in much of the industry. This is driving changes in occupational and employment structures and patterns of organisation of work for people working in the engineering sector. There are many SMEs operating in the sector, although, as has been outlined above, the larger companies have been leading change through their strategic position in supply chains.

**Continuing vocational training**

Further training organised by the employer may seek to develop the skills of their workforce - both their technical and 'soft' skills of communication and teamwork. Much attention is given to learning while working. However, companies vary greatly in the extent to which their regular working arrangements provide a rich or poor learning environment. Similarly, in some cases training is aimed at improving only technical skills and in others is part of a programme offering wider learning opportunities. The latter can depend on the size of the companies as large firms have an advantage in being able to offer a greater range of formal training opportunities, as well as, in some cases, a structured development programme. The latter may be associated with work on a range of projects and/or in a variety of departments or contexts.

Generally greater attention is being given to work-based learning, in relation to teamworking, continuous improvement programmes, supervisory training and supply chain development. External training and qualifications are also being used either for some staff or as part of general employee development training. Some companies were making much greater use of graduate level entry for supervisory or production support positions. Companies vary greatly in the extent to which regular work activities provide a rich or poor learning environment, depending upon how work is organised, the nature of production and the size of the company. Different groups of workers may also have differential access to further education and training. Overall, employers' commitment to learning is very variable, but general competitive pressures and actions across supply chains is driving at least some learning in the workplace.

### 6.1.2 Information and communication technology

Occupations in Information and Communication Technologies (ICT) range widely from those requiring very specific in-depth technical knowledge and expertise to others where a broader technical ability is needed alongside good interpersonal skills or expertise in specific applications areas. ICT skills are used in both the development of ICT products and in their application across a wide range of services and industries. Given the pace of development in the industry, there are significant changes taking place in occupational and employment structures for people working in the ICT sector. It is worth considering some of the characteristics of the industry as they will affect future occupational structures, skills needs and patterns of continuing education, training and learning. The following is mainly based on an Assessment of Skills Needs in Information and Communication Technology that took place in 2000 (Connor *et al*, 2001).

Firstly, there is a high proportion of small companies in the ICT sector. Larger companies, however, account for the majority of the workforce. ICT dedicated businesses, establish-

ments in electronics and telecommunications are likely to be larger than those in computer services, whilst data processing and data base companies and the new media and web design companies tend to be much smaller – often micro businesses. Secondly, significant numbers of particular groups of ICT staff are self-employed or work as independent contractors. UK based surveys suggest industry age profiles are only slightly younger that the average for the whole workforce, although those in the new media industries and web design are much younger. There is a very significant gender bias in employment in ICT with a significant under-representation of women. Where women are employed, they tend to be in the lower skilled and lower paid occupations. Job turnover is significantly higher than in other occupations (Connor *et al*, 2001).

When it comes to the organisation of work, employers seem to be trying to achieve a balance between autonomy and control. There appears to be differences as to the scope of autonomy and responsibility given to employees: that is, an individual may be given autonomy but within a relatively narrow area. In other cases the autonomy is tightly constrained by the nature of the work and the pattern of work organisation: for example, as a member of a very large team working on software development. Elsewhere considerable autonomy may be given to teams as to how they organise their work and achieve their goals.

It is also interesting to note that there are a couple of 'classical' systems differences between the operation of UK labour market and, for example, the German labour market that applies particularly strongly in the ICT sector. In the UK an important focus is upon learning while working through responsibility in the job itself, whereas in Germany much greater attention is given to preparation and learning for responsibility through a comprehensive programme of initial training. Another crucial difference is that frequently moving between employers is much more common in the UK than in Germany. In the UK context such mobility means the transfer of skills and knowledge, including tacit knowledge, is facilitated by staff often changing their jobs. (Mason and Wagner, 2000).

### Skills gaps

According to Connor *et al* (2001) the main gaps felt by ICT employers were: general IT user skills; general awareness of developments in the industry; problem solving; oral communication skills; and customer handling skills / customer service. Mason (2000) argues that that there are two major skills deficits among ICT professionals. The first is in general IT systems and competencies in areas such as networks and operating systems combined with the inter-personal communications and team-working skills required for effective interaction with work colleagues and with customers. The second is in IT 'consultancy skills' – defined as a hybrid skill set combining up-to-date technical knowledge with the capability to 'understand other people's businesses' and who could therefore take responsibility for the design of systems that will meet clients' IT needs and networking requirements.

### Initial skills formation for ICT specialists and others developing ICT skills

The United Kingdom has a mass Higher Education system, where many of the degree and sub-degree programmes in technical areas are work-oriented. Some programmes do include industrial placements and many students will get relevant experience during vacations. Higher education programmes may be quite short (just two or three years), but there is an

expectation that this will be coupled with subsequent learning while working. Universities and colleges offer degrees, both at undergraduate and graduate levels, producing graduates, who have a solid foundation in computer science and engineering. More practical-oriented courses in Information Technology prepare students to work in other areas of the industry and indeed in ICT-related work in other sectors. Companies often recruit technical graduates, but in some specialist areas they will also consider young people who have acquired IT experience outside formal education structures. Outside HE a very wide range of IT qualifications, from basic to professional, including those offered by the vendors themselves, can be taken. These qualifications, which may be aimed at either specialists or users, can be studied in colleges, as part of formal work-based training programmes or through self-study. Such people fill many of the jobs requiring ICT skills, but many others learn or develop these skills through work itself, without taking any additional qualifications.

### Continuing training

Further training organised by the employer may seek to develop the skills of their workforce - both their technical and 'soft' skills of communication and teamwork. Much attention is given to learning while working. However, companies vary greatly in the extent to which their regular working arrangements provide a rich or poor learning environment. Similarly, in some cases training is aimed at improving only technical skills and in others is part of a programme offering wider learning opportunities. The latter can depend on the size of the companies as large firms have an advantage in being able to offer a greater range of formal training opportunities, as well as, in some cases, a structured development programme. The latter may be associated with work on a range of projects and/or in a variety of departments or contexts.

### Generic skills

Generic skills are seen as almost universally important if working with ICT and Connor *et al* (2001) in their UK assessment of ICT skill needs identified three main themes. The first is that to develop or operate effective ICT solutions, ICT staff increasingly have to combine a high level of technical skill with the ability to work with other fellow professionals as part of a team and/or with internal and external customers to understand and meet their requirements. A second main development involves being capable of working in a rapidly changing environment, which means that attributes such as the ability to work flexibly and imaginatively are of growing importance. Finally, ICT professionals need to be customer sensitive and apply their skills in an integrated business environment.

These themes are reflected in another ICT Skills Survey (NOP, 2001) where respondents identified the importance of the following non-technical skills for working in ICT related roles:

- Problem solving – particularly for software development professionals and ICT operations managers
- Oral communication skills – of most importance in sales and training roles
- Team working skills – especially for software developers and trainers
- General IT user skills – thought to be most important in less skilled roles such as ICT support operators, administrators and helpdesk operators

– Customer handling – highlighted for sales professionals but also seen as important for trainers, customer systems support professionals and helpdesk personnel.

**Mobility**

There is very strong demand from employers for people with technical IT skills and 'soft' skills, including abilities to work in teams and communicate effectively with customers. Those with these skills are in demand in all areas of the country and there are few work constraints on employees moving between geographical areas. People may be able to work as self-employed consultants or use the technology to work remotely (with in some cases considerable distances between where they live and work). Additionally, a culture has developed whereby many technical workers (especially graduates) expect to change employers several times early in their career, as a means of broadening their experience, applying their skills and knowledge in a variety of settings and improving their salary. Employees learn by moving from company to company, and this process also leads to a transfer of 'tacit knowledge' (Mason and Wagner, 2000).

**Flexibility**

The IT industry is very diverse as are patterns of work organisation. In working on software development in large companies there may be considerable flexibility in work to the extent of working in multi-national teams where the work crosses time zones and never stops. In some companies much of the work is now team-based, but in other contexts the dominant mode of working is still individual. The technological basis of work is changing so rapidly that this too requires a degree of flexibility in terms of willingness to update and learn new technical skills. Some areas of work also require significant creativity and this too depends upon a degree of flexibility in thinking. Some companies are offering flexibility in working patterns in order to accommodate those employees seeking more of a life/work balance.

## *6.2 Analysis based on data generated from 2002 Survey of Employers in Coventry and Warwickshire*

One key element of the PARTICIPA project was to collect local area data on technical workers' participation in continuing vocational education and training (CVET). For England the local area chosen was Coventry and Warwickshire. Coventry and Warwickshire is part of the West Midlands region. A major survey of Coventry and Warwickshire Employers (2002) was conducted by IFF Research Ltd and the University of Warwick Institute for Employment Research (IER). It comprised 1,697 telephone interviews with employers conducted between 10th April and 13th May 2002. The full results of the survey are presented in Hasluck et al (2002), but it is worth summarising the key results here and then drawing out some of the key findings as they relate to technical workers' participation in CVET and learning.

### 6.2.1 Contextual background

#### Local employment

The Coventry and Warwickshire sub-region forms an important part of the West Midlands region. A distinctive feature of both the West Midlands and Coventry and Warwickshire has been the above UK average level of employment in manufacturing, particularly engineering. Increased employment in the West Midlands service sector has outpaced the decline in manufacturing employment, although the net result has been a slightly slower rate of overall employment growth than the UK average. Coventry and Warwickshire has been a significant beneficiary of such service sector growth. There has been significant growth in the number of service sector jobs as the result of the (re)location of head office functions to the area, the establishment of call centres and distribution centres and similar developments and this has helped to redress the previous over-dependence on the automotive sector.

The Annual Business Inquiry (ABI) reveals that the number of establishments in Coventry and Warwickshire has been growing in recent years, from 28,292 in 1998 to 29,759 in 2000. The largest increases have been in transport and communications and banking, finance and insurance (which includes business and professional services). There were falls in the number of employing establishments in manufacturing and other services over the same period.

The number of claimant count unemployed people Coventry and Warwickshire was 10,408 in April 2002. An above UK average proportion of the West Midlands workforce is employed in jobs that require low or no qualifications. The Coventry and Warwickshire workforce is more highly qualified than that of the West Midlands as a whole, but no more than the average across the UK.

Traditionally the West Midlands and Coventry and Warwickshire have had a strong manufacturing base, yet only 19 per cent of employers were engaged in manufacturing and construction in 2002 with most workplaces – 65 per cent - engaged in traded services. This is only a partial measure of industrial activity since it fails to reflect the number of people employed in each industry. Analysed with respect to the number of employees, the importance of the manufacturing/construction base is much more apparent since it employs around 27 per cent of the Coventry and Warwickshire workforce. Traded services employed around 47 per cent of the workforce, and public administration, health and education around 21 per cent of the workforce. The public sector accounted for 17 per cent of the workforce.

#### Business Issues

In the preceding 12 months, 41 per cent of workplaces reported that sales (budget in the public sector) had increased after allowing for inflation, 32 per cent said it had stayed the same, and 16 per cent said that it had decreased. On average, sales were reported to have grown by around 18 per cent in those companies experiencing growth. For the following 12 months, 51 per cent of workplaces reported that they anticipated a growth in sales, 33 per cent that it would stay the same, and 7 per cent that it would decrease. Overall, one may say that there was a degree of confidence about future business expansion. The main

threats to growth reported by private sector companies related mainly to competition from other companies (11 per cent of workplaces) and lack of demand (10 per cent).

A dynamic economy requires companies to be bringing new products and services to the market. In the preceding 12 months 39 per cent of workplaces reported that they had done so (compared to 36 per cent in 2001). This was much higher in larger workplaces (200 or more employees) where around 66 per cent of workplaces reported bringing new services and products to market. Over the next 12 months, 40 per cent of companies said that they would be bringing new products and services to market, compared to 35 per cent in 2001. Overall, 29 per cent of organisations said that they faced barriers to bringing new products to market, mainly due to a lack of funding (7 per cent of all workplaces) or lack of staff (6 per cent of all workplaces).

**Structure of employment**

According to ABI data, around 375,000 people were employed in Coventry and Warwickshire in 2000, of which:

– 51 per cent were women (47 per cent in the UK); and
– 25 per cent worked part-time (25 per cent in UK).

Around 38 per cent of female employment was part-time (the corresponding figure for the UK is 43 per cent). Employment growth in the preceding 12 months had been of the order of 1.5 per cent (the latest figure for the UK suggests employment growth of around 0.5 per cent between January 2001 and January 2002). Within this overall figure manufacturing employment has fallen by around 7 per cent. Over the next 12 months, 31 per cent of workplaces thought that employment would increase, 62 per cent said it would stay the same, and 4 per cent said it would decrease. Labour turnover was estimated at around 19 per cent but this was much higher in wholesale/retail at around 24 per cent, and in business services where it was 31 per cent. Managers accounted for the greatest percentage of staff in workplaces (33 per cent of all staff were managers in the average workplace) followed by administrative and secretarial staff (16 per cent). Employers reported that 92 per cent of their workforce was comprised of people from the white ethnic group. Labour Force Survey (LFS) estimates indicate that around 95 per cent of the UK workforce is from this ethnic group.

The average workplace in Coventry and Warwickshire employed 13 people but this masked a wide range of establishment size. Workplaces employing less than 25 people accounted for 92 per cent of all workplaces. At the other extreme, only 1 per cent of workplaces employed 250 or more, but they employed 30 per cent of total employment in Coventry and Warwickshire. Slightly more than two thirds (69 per cent) of workplaces were the sole site from which the business operated. Around 10 per cent were regional, national or international head offices and the remainder (22 per cent) were branch plants where control lay outside the establishment being surveyed. The value of turnover in most Coventry and Warwickshire businesses was modest (less than £1 million) reflecting the number of small businesses in the area. Around 3 per cent of businesses had turnover in excess of £5 mil-

lion. However, cumulatively, the value of Coventry and Warwickshire output based on turnover was estimated to be in the region of £23 billion.

Key findings in relation to employment in Coventry and Warwickshire include:

- a large proportion (30 per cent) of employment was located in just 1 per cent of employers (those employing 250 or more). The share of employment in production industries in Coventry and Warwickshire was above the national average;
- women now account for the majority (51 per cent) of the workforce in Coventry and Warwickshire. Around 38 per cent of women were working in part-time jobs. While the number of men working in part-time jobs remains small, it has increased sharply in recent years;
- people from ethnic minority groups accounted for around 8 per cent of the employed workforce in Coventry and Warwickshire. Around 6 per cent of workplaces had a workforce within which at least 50 per cent were people from ethnic minority groups;
- employment in Coventry and Warwickshire grew by 1 per cent over the 12 months prior to the 2002 Survey (twice the national average growth rate). Manufacturing employment continued to decline over this period (by 7 per cent) while employment in finance doubled. The number of people employed in the smallest workplaces decreased In the preceding year. overall labour turnover was estimated to be 18 per cent. In the preceding year. This was significantly lower that the national rate (45 per cent);
- 39 per cent of employers had recruited at least one person in the last 12 months. Recruitment was most likely by employers in public administration, health and education. Despite a falling level of employment, manufacturing continued to recruit; the most commonly used methods of recruitment tended to be informal: 64 per cent of employers had used 'word of mouth' as a means of recruitment while 35 per cent had responded to speculative applications ;
- half (52 per cent) of recruiters had hired young people. Of these 36 per cent reported a problem in so doing. Such problems related to a lack of customer handling skills, communication skills and technical or practical skills.

**Recruitment, vacancies, and hard-to-fill vacancies**

In the preceding 12 months 39 per cent of workplaces had recruited staff (42 per cent in 2001). Around three-quarters of workplaces with ten or more staff had recruited staff. At the time of the survey, 16 per cent of workplaces currently had vacancies. The total estimated number of vacancies at the time of the survey was around 12,000 – this corresponds to 3.2 per cent of the workforce compared to 3.7 per cent in England in 2001 (based on the Employers Skill Survey 2001). Where workplaces had vacancies the principal means of recruiting staff were:

- word-of-mouth (64 per cent of workplaces);
- local press (53 per cent);
- Job-centre/Employment Service (36 per cent);
- speculative inquiries (35 per cent);
- employment/recruitment agencies (24 per cent);
- contacting colleges and schools (18 per cent).

Around 10 per cent of workplaces reported that they had hard-to-fill vacancies (that is where the respondent self-defined the vacancy as hard-to-fill). The two most commonly cited reasons for there being hard-to-fill vacancies (HtFVs) were 'a low number of applicants with the required skills' (26 per cent of establishments with HtFVs) and 'not enough people interested in doing this type of work' (25 per cent of those with vacancies). 'A low number of applicants with the required attitude, motivation or personality', mentioned by 16 per cent of those with HtFVs, 'poor terms and conditions' and 'too much competition from other employers' (each mentioned by 14 per cent of those with HtFVs) were also quite common causes of recruitment difficulties. From the responses given, a definition of HtFVs which are related to skills shortages can be defined as any vacancy where at least one of the following reasons were cited by the respondent:

– low number of applicants with the required skills;
– low number of applicants with the required attitude, motivation or personality
– lack of work experience the company demands;
– lack of qualifications the company demands.

Overall, there were around 5,800 hard-to-fill vacancies or 1.5 per cent of employment (compared to 1.7 per cent in England in 2001 based on the Employers Skill Survey 2001). The main findings indicate that in skilled trades occupations a disproportionately large share of vacancies were hard-to-fill. Where workplaces experienced hard-to-fill vacancies they had a substantial impact on organisational performance, including:

– difficulties meeting customer service objectives (53 per cent of workplaces);
– difficulties meeting quality standards (42 per cent);
– delays developing new products and services (40 per cent);
– increased operating costs (39 per cent).

It should also be noted that 32 per cent of workplaces with hard-to-fill vacancies reported that it had led to a loss of business or orders. The main response to having hard-to-fill vacancies was to increase recruitment advertising (51 per cent of workplaces with hard-to-fill vacancies), expand recruitment channels (51 per cent), increase salaries (43 per cent), and increase training (40 per cent).

### 6.2.2 Skills requirements in Coventry and Warwickshire

#### Proficiency of existing staff and skill gaps

While a failure to fill vacant jobs and obtain the skills needed on the external market can have an obvious impact on the business, shortfalls in the skills of the existing workforce can also have a damaging effect of business performance. A skills gap is said to exist when there is a gap between the skills possessed by staff and those required in order to meet the needs of the business. A skills gap may exist in relation to the skills required for the organisation's day to day business, so that employees may 'muddle through' by using less productive methods of working. Skills gaps though are likely to be more evident where the business is impelled to change. When a business is seeking to introduce new technology, new working methods or develop new products or services, additional skills that go beyond

those required for every day operations may be required but the existing workforce may lack such skills. In order to identify the extent of possible skills gaps, employers were asked to comment on the proficiency of their existing staff.

Approximately 20 per cent of workplaces reported that they had a skills gap, that is a gap between the skills possessed by staff and those required to meet the needs of the business. Where staff were not fully proficient this was mainly due to lack of experience in those recently recruited or a failure to develop and train staff. The impact of staff not being fully proficient was much the same as for hard-to-fill vacancies: difficulties meeting customer service objectives or quality standards. Over half of those employers who had staff who were less than fully proficient had responded by providing more training.

## Skill needs and skill deficiencies

The following figure shows the skills that employers felt they needed now and those they expected to need over the next 12 months. Information is also provided on the skills that workplaces found difficult to recruit in relation to HtFVs and those that were giving rise to skill gaps within the organisation. The key finding is the strong demand for technical/practical skills. The skill needs that were giving rise to HtFVs are particularly interesting since they give an indication of those skills in short-supply in the local economy. From the figure it is apparent that there are a wide range of skills that workplaces with HtFVs reported difficult to find, including customer handling, personal skills, flexibility (capacity to more than one task), numeracy and literacy.

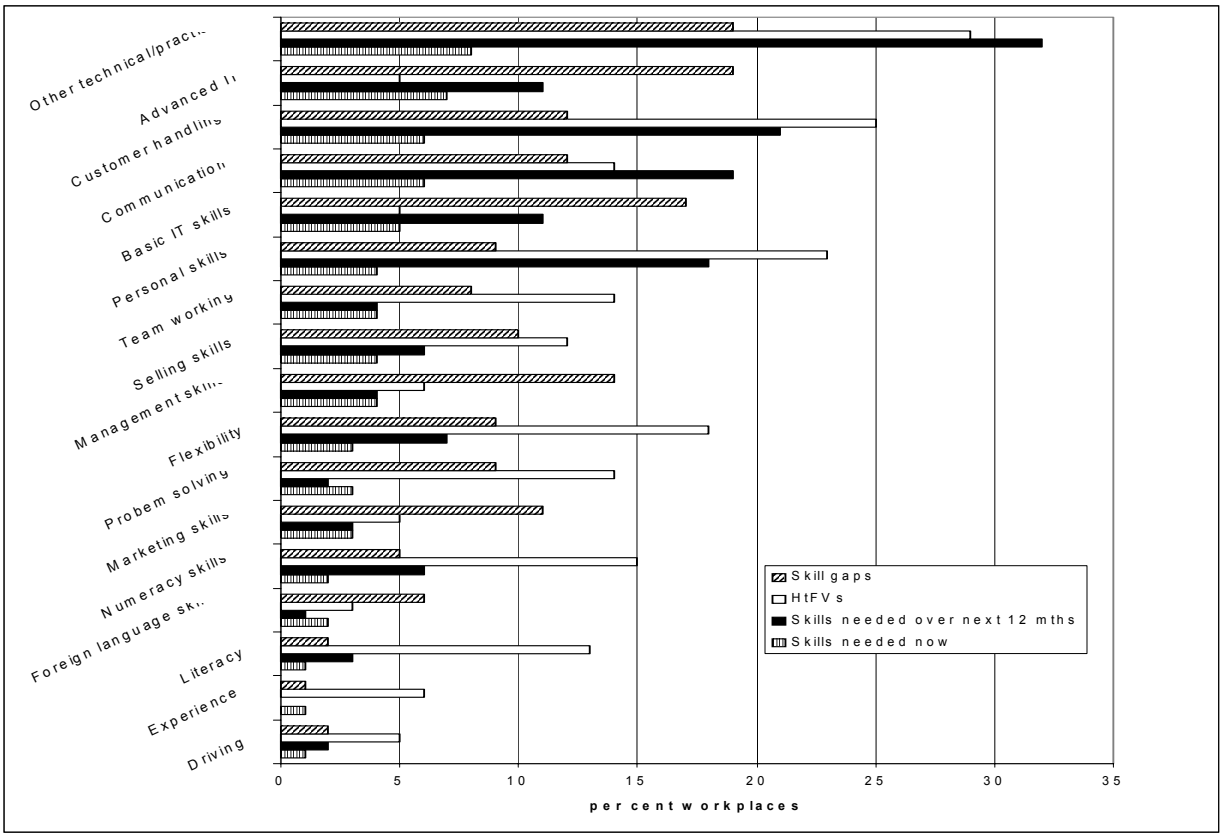


*Fig. 1 Skills required currently and in the future*
*Source: Coventry and Warwickshire Survey of Employers 2002(Base: all employers)*

| | Production | Finance / Business Services (including IT) |
|---|---|---|
| Other technical practical | 47 | 34 |
| Customer handling | 5 | 14 |
| Communication | 7 | 19 |
| Personal | 20 | 14 |
| Advanced/IT software | 6 | 24 |
| Basic computer literacy | 7 | 17 |
| Flexibility | 12 | 5 |
| Numeracy | 3 | 6 |
| Selling | 5 | 9 |
| Management | 2 | 2 |
| Team working | 4 | 4 |
| Literacy | 2 | 3 |
| Marketing | 4 | 4 |
| Other | 3 | 3 |
| Driving skills | 2 | 1 |
| Health and safety | 2 | - |
| Problem solving | 2 | 3 |
| Foreign languages | - | 1 |
| Lack of applicants | 1 | - |
| Personal attributes | 2 | 1 |
| Teaching | - | 1 |
| Training/qualifications | 1 | - |
| Experience | 1 | 1 |
| Don't know | 15 | 8 |
| | | |
| Weighted base | 5,644 | 8,519 |
| Unweighted base | 356 | 391 |

*Tab. 1 Skills needed over the next 12 months by industry (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF); Base: All employers*

Key point: Overall, it is very clear that employers required increased levels of technical (practical and ICT) skills, although for technical workers these may be allied to the need to improve other skills such as communication, customer handling, flexibility and personal skills.

### 6.2.3 Provision of training in Coventry and Warwickshire

Resorting to increased training was a common response by employers facing recruitment problems and skill gaps in Coventry and Warwickshire. Furthermore, the Employers Skill Survey 2001 (ESS2001) revealed that a failure to provide training was one of the main reasons employers cited in the formation of skill gaps.

#### Formal business and training plans

Any impact that a business plan, human resource plan, or training plan has on business performance will, ultimately, depend upon the content of those plans and the extent to which they are paid heed to by management. Accordingly these forms of formal planning

are uncertain indicators and are usually associated with larger organisations which, as a consequence of their size, need to engage in a degree of codification of their aims and objectives. Nevertheless, the existence of a training plan may well indicate that the training needs and human resource development of employees are being formally addressed. In 2002, around 44 per cent of workplaces had a written business plan, slightly up on 2001 and 2000. Approximately 35 per cent had a training plan and 26 per cent had a training budget. The percentage of workplaces that had neither a business plan, a human resource plan, nor a training plan stood at 47 per cent, the same as in 2001.

| | Coventry and Warwickshire | | | England |
|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2001 |
| Written business plan | 40 | 42 | 44 | 45 |
| HR plan in written format | 26* | 33* | 22 | 15 |
| Training plan | | | 35 | 24 |
| Training budget | 20 | 26 | 26 | 17 |
| | | | | |
| None of the above | 53 | 47 | 47 | 46 |
| | | | | |

*Tab. 2 Incidence of human resource and training plans (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF), Employers Skill Survey 2001 Base: All employers*
*Note: * relates to HR plan and training plan combined in 2000 and 2001*

The incidence of any type of plan increased with the size of workplace (see Tab. 3). For instance, 81 per cent of workplaces with 200 or more employees had a training plan and 75 per cent had a training budget compared to 28 per cent with a training plan and 20 per cent with a training budget in workplaces with between 1 and 10 employees. The private sector was more likely to have a business plan compared to the public sector but less likely to report a training budget. Around 64 per cent of private sector workplaces reported a business plan compared to 41 per cent in the public sector, but only 27 per cent of private sector workplaces reported a training budget compared to 47 per cent of public sector ones. Generally, the level of formal planning relating to training in the private sector is inflated somewhat by the relatively high incidence of training plans and budgets recorded by the 'other services' sector.

| | Number of Employees | | | | |
|---|---|---|---|---|---|
| | 1-10 | 11-24 | 25-199 | 200+ | Total |
| Written business plan | 38 | 62 | 83 | 89 | 44 |
| HR plan | 17 | 37 | 51 | 67 | 22 |
| Training plan | 28 | 66 | 74 | 81 | 35 |
| Training budget | 20 | 42 | 69 | 75 | 26 |
| | | | | | |
| *Weighted base* | *24,701* | *2,753* | *2,122* | *219* | *29,796* |
| *Unweighted base* | *803* | *424* | *426* | *44* | *1,697* |
| | | | | | |

*Tab. 3 Formal training plans and size of workplace (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF), Employers Skill Survey 2001 Base: All employers*

There has been a steep increase in the provision of training over recent years. In 2000, 17 per cent of workplaces provided on-the-job and off-the-job training but this had risen to 33 per cent by 2002. By 2002, over half of all workplaces provided at least on-the-job training to its workforce. The following tables show the proportion of workplaces providing on-the-job and off-the job training according to the type of formal plan they had in place (or not). It can be seen that the presence of formal plans is associated with an increased incidence of training. For example, where workplaces had a training budget 71 per cent provided off-the-job training compared to just 32 per cent that it not have a training budget. This is not to suggest a causal link, indeed the direction of causality is difficult to identify. Do workplaces engage in a relatively high level of training because there is a training budget, or is it because of their involvement in training that they obtain a training budget? What one is probably observing is a simultaneous process where the training budget aids the provision of training in organisations already committed to its delivery.

| | Coventry and Warwickshire | | | England |
|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2001 |
| Off and on-the-job training | 17 | 28 | 33 | 45 |
| Off-job only | 10 | 10 | 9 | 10 |
| On-job only | 20 | 17 | 21 | 33 |
| Any off-the job | - | - | 42 | 55 |
| Any on-the-job | - | - | 54 | 78 |
| None | 53 | 45 | 37 | 12 |

*Tab. 4 Extent of on-the-job and off-the-job training (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF); Employees Skill Survey 2001 Base: All employers*

| | Any off-the job | Any on-the-job | Neither |
|---|---|---|---|
| Business plan | | | |
| Yes | 58 | 69 | 21 |
| No | 58 | 49 | 32 |
| HR plan | | | |
| Yes | 68 | 83 | 11 |
| No | 29 | 40 | 49 |
| Training plan | | | |
| Yes | 65 | 81 | 12 |
| No | 29 | 38 | 51 |
| Training budget | | | |
| Yes | 71 | 80 | 12 |
| No | 32 | 44 | 46 |
| | | | |
| *Weighted base* | *12,642* | *16,009* | *10,996* |
| *Unweighted base* | *1,026* | *1,192* | *345* |

*Tab. 5 Provision of training and the existence of formal training plans (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF)- Base: All employers*

The following table shows larger workplaces were more likely to provide training, as around 90 per cent of workplaces with 200 or more employees had provided on-the-job and off-the-job training over the last year, compared to 26 per cent amongst those with between 1 and 10 employees. There was considerable variation between industries in the extent of

their provision of training. At a broad level the public sector was more likely to provide either form of training compared to the private sector. At a more detailed level the production sector was less likely to provide either form of training. For example, around 33 per cent of production workplaces reported delivering off-the-job training compared to 46 per cent in finance or business services, and 81 per cent in public administration (including health and education).

| | Size of Workplace | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **1-10** | **11-24** | **25-199** | **200+** | **Public** | **Private** | **Production** | **Finance/ Business Services** |
| Off-the-job and on-the-job training | 26 | 58 | 78 | 90 | 56 | 30 | 22 | 31 |
| Off-the-job only | 10 | 8 | 7 | - | 5 | 9 | 11 | 14 |
| On-the-job only | 22 | 20 | 11 | 9 | 18 | 22 | 26 | 22 |
| Any off-the job | 48 | 78 | 89 | 99 | 61 | 40 | 33 | 46 |
| Any on-the-job | 36 | 67 | 85 | 90 | 74 | 52 | 47 | 53 |
| None | 43 | 13 | 4 | 3 | 22 | 39 | 41 | 33 |
| *Weighted base* | *24,701* | *2,753* | *2,122* | *319* | *2,545* | *26,122* | *5,644* | *8,519* |
| *Unweighted base* | *803* | *424* | *426* | *44* | *241* | *1,360* | *356* | *391* |

*Tab. 6 Provision of training by size of workplace and industry (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF) Base: All employers*

The following table shows the proportion of workplaces providing on-the-job and off-the job training according to the type of formal plan they had in place (or not). It can be seen that the presence of formal plans is associated with an increased incidence of training. For example, where workplaces had a training budget 71 per cent provided off-the-job training compared to just 32 per cent that did not have a training budget. This is not to suggest a causal link, indeed the direction of causality is difficult to identify. Do workplaces engage in a relatively high level of training because there is a training budget, or is it because of their involvement in training that they obtain a training budget? What one is probably observing is a simultaneous process where the training budget aids the provision of training in organisations already committed to its delivery.

| | **Any off-the job** | **Any on-the-job** | **Neither** |
|---|---|---|---|
| Business plan | | | |
| Yes | 58 | 69 | 21 |
| No | 58 | 49 | 32 |
| HR plan | | | |
| Yes | 68 | 83 | 11 |
| No | 29 | 40 | 49 |
| Training plan | | | |
| Yes | 65 | 81 | 12 |
| No | 29 | 38 | 51 |

| | Any off-the job | Any on-the-job | Neither |
|---|---|---|---|
| Training budget | | | |
| Yes | 71 | 80 | 12 |
| No | 32 | 44 | 46 |
| | | | |
| *Weighted base* | *12,642* | *16,009* | *10,996* |
| *Unweighted base* | *1,026* | *1,192* | *345* |

*Tab. 7 Provision of training and the existence of formal training plans (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF) Base: All employers*

## Types of training provided

Where employers provided training job specific training was the most common, reported by 83 per cent of employers (see Fig. 2). Health and safety (69 per cent), training in new technology (57 per cent), and induction training (53 per cent) were the other commonly provided forms of training. Only 4 per cent of employer funded or arranged training was in foreign languages which is more or less in line with the national statistics. Generally, the public sector was more likely to report that it provided each type of training. For instance, 95 per cent of public sector workplaces provided job specific training compared to 81 per cent in the private sector. It was the production sector that was least likely to provide any form of training. Other key findings by industry include: (a) soft skills training was particularly common in the distribution sector; and (b) training in new technology was particularly common in finance/business services.

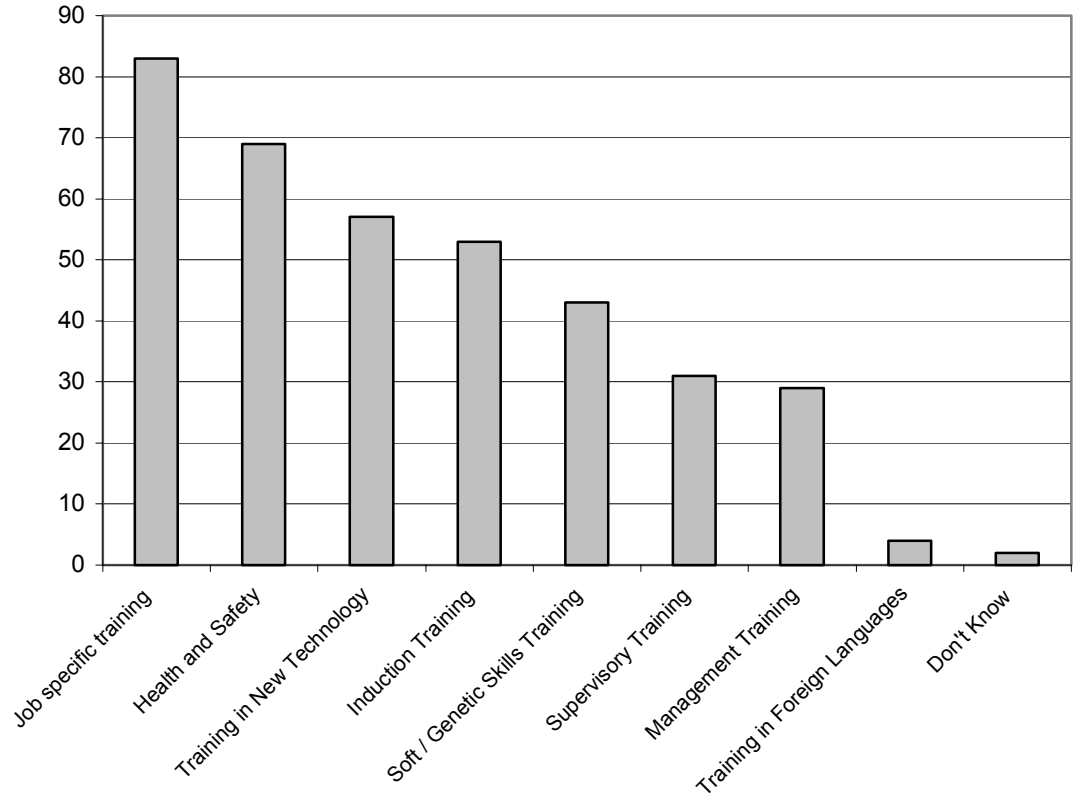


*Fig. 2 Types of training provided*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF) Base: All providing training*

## Proportion of staff in receipt of training

The following tables show the proportion of staff who received training funded or arranged by their employer over the last 12 months, and corresponding data for size of workplace.

| | Production | Distribution | Transport and communication | Finance/ Business Services | Public Admin, *etc* | Other Services | Total |
|---|---|---|---|---|---|---|---|
| Proportion of staff receiving training | | | | | | | |
| None | 11 | 13 | 21 | 8 | 3 | 17 | 11 |
| 1-20% | 11 | 7 | 4 | 2 | 3 | 6 | 5 |
| 20-49% | 33 | 13 | 20 | 21 | 16 | 25 | 21 |
| 50-74% | 16 | 25 | 11 | 23 | 18 | 13 | 20 |
| 75-99% | 7 | 3 | 3 | 4 | 15 | 10 | 6 |
| 100% | 22 | 39 | 42 | 42 | 46 | 29 | 37 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | | | | | | | |
| *Weighted base* | *3,285* | *4,998* | *1,027* | *5,684* | *2,295* | *1,300* | *18,589* |

*Tab. 8 Percentage of staff receiving training by industry*
*Source: Coventry & Warwickshire Survey of Employers 2002 Base: All employers providing training data*

| | Number of employees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1-4 | 5-10 | 11-24 | 25-49 | 50-99 | 100-249 | 250-499 | 500-999 | 1000+ | Total |
| Proportion of staff receiving training | | | | | | | | | | |
| None | 14 | 11 | 6 | 2 | 0 | 1 | - | - | - | 11 |
| 1-20% | - | 8 | 14 | 14 | 14 | 24 | 7 | 8 | 100 | 5 |
| 20-49% | 15 | 32 | 23 | 21 | 20 | 26 | 30 | 5 | - | 21 |
| 50-74% | 25 | 18 | 10 | 18 | 9 | 4 | 2 | 53 | - | 20 |
| 75-99% | 2 | 9 | 11 | 8 | 14 | 5 | 44 | 5 | - | 6 |
| 100% | 44 | 22 | 37 | 36 | 42 | 40 | 17 | 29 | - | 37 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | - | 100 |
| | | | | | | | | | | |
| *Weighted base* | *9,723* | *4,371* | *2,342* | *1,161* | *558* | *270* | *98* | *59* | *7* | *18,589* |

*Tab. 9 Percentage of staff receiving training by size of workplace*
*Source: Coventry & Warwickshire Survey of Employers 2002 Base: All employers providing training data*

## Training and formal qualifications

A relatively small percentage of staff were engaged in training leading to a qualification. Approximately 58 per cent of those workplaces reporting that they were engaged in training said that it led to a qualification.

## Barriers to employers providing more training

The main barriers to training are outlined in the following table. The key findings are as follows:

– cost was less of a barrier to training in 2002 than in 2000 but slightly more so in 2001. This suggests that cost, as a barrier, fluctuates in line with the economic cycle;

– supply issues appear to be of little consequence as they were reported by a small percentage of workplaces;
– lack of time to source training was just as much a barrier in 2002 as it was in 2000 reported by between 15 and 16 per cent of workplaces.

Perhaps the key finding is the much lower percentage of workplaces reporting no barriers in 2002 compared to earlier years. Also it is important to note that lack of interest from staff is consistently seen as of little importance (never cited as a barrier by more than 2% of employers).

| | | 2000 | 2001 | 2002 |
|---|---|---|---|---|
| What limits to amount of training | | | | |
| | | | | |
| Cost Issues | | | | |
| | Cost of training | 22 | 14 | 17 |
| | Cannot afford staff time off for training | 13 | 8 | 12 |
| | Capital budget reservations | 2 | 2 | 5 |
| | | | | |
| Supply Issues | | | | |
| | Times of day at which course run | 6 | 10 | 6 |
| | Quality of training offered by training providers | 2 | 1 | 1 |
| | Do not have expanded staff to provide training | * | 1 | * |
| | Cannot find training needed | 2 | 1 | 2 |
| | | | | |
| Management Issues | | | | |
| | Lack of time to source training | 16 | 2 | 15 |
| | No one in organisation skilled at buying training | | 1 | |
| | Never been able to prove benefits of training | 2 | 1 | 1 |
| | No one skilled at identifying training needs | * | * | * |
| | Concerns about trained employees taking jobs with other companies | 1 | * | * |
| | | | | |
| Other | | | | |
| | Staff not interested in developing skills | 1 | 2 | 2 |
| | Other | 3 | 3 | 1 |
| | | | | |
| No barriers | | 53 | 66 | 36 |
| Don't know | | 2 | 1 | 6 |
| | | | | |
| *Weighted base* | | *n/a* | *n/a* | *29,796* |
| *Unweighted base* | | *n/a* | *n/a* | *1,697* |

*Tab. 10 Barriers to providing more training (percentages)*
*Source: Coventry and Warwickshire Surveys of Employers 2000 – 2002 Base: All employers*

## Summary of training activity

The extent to which workplaces had plans relating to human resource development and training was as follows:

– a business plan 44 per cent (42 per cent in Coventry and Warwickshire in 2001, 45 per cent in England in 2001 [as recorded by the Employers Skill Survey 2001]);

– a formal human resource plan 22 per cent (15 per cent in England in 2001);
– a training plan 35 per cent (33 per cent in Coventry and Warwickshire in 2001, 24
– per cent in England in 2001);
– Training budget 26 per cent (26 per cent in Coventry and Warwickshire in 2001, 17
– per cent in England in 2001). Where employers had a training budget, on average
– they spent £10,000 a year.

The incidence of any type of plan increases with the number of people employed at the workplace. In the preceding 12 months 63 per cent of employers reported that they had arranged or funded either on-the-job or off-the-job training for their staff; this is up on the 55 per cent reported in 2001 and 47 per cent in 2000. Respondents were asked about the barriers to providing more training; 36 per cent said that there were no barriers. The most frequently cited reason was the cost of training (17 per cent of all workplaces) which was mentioned more often as a reason by **those that actually** provided on- or off-the-job training compared to those not providing either form of training. The only other significant responses related to lack of time to source training (12 per cent), or where the workplace could not afford to allow staff to take time off for training (12 per cent).

The key point here is that the reasons technical workers do not participate more extensively in training provided by their employers are much more likely to relate to supply, cost and management issues than individual factors.

Therefore it may be interesting to investigate whether a more formal commitment to training and development acts to improve supply of training. One such scheme is the Investors in People programme.

### Investors in People

Investors in People (IiP) was introduced in 1991 to assist companies improve their competitiveness and was based around four key principles:

– commitment to develop all staff to achieve business goals;
– plan and review of staff development and training needs;
– take action to train and develop employees throughout their employment; and
– evaluation of training expenditure to improve future investments.

In 2000 the standard was revised with a greater emphasis placed on outcomes rather than processes. By 2001, approximately 24,000 organisations held the standard. The Employers Skill Survey 2001 revealed that 9 per cent of all workplaces in England were IiP accredited and for Coventry and Warwickshire the proportion of accredited workplaces is not significantly different at 8 per cent. As well as 8 per cent of workplaces currently accredited a further 5 per cent said they were committed to obtaining the standard. Overall, 85 per cent of all workplaces were not accredited. Around 22 per cent of all workplaces in Coventry and Warwickshire said that they had never heard of IiP (that is, around a third of all those which were not accredited).

## Organisational performance and IiP accreditation

IiP was designed to assist organisational performance through a range of human resource measures. Demonstrating increased organisational performance requires a 'before and after IiP' longitudinal study that can isolate the impact IiP has had. Generally these data are not available. On the basis of the survey evidence presented here it is possible to provide some insights into whether accredited companies performed better than non-accredited ones over the last 12 months or so. A number of measures were chosen: changes in sales turnover; employment growth; existence of recruitment problems; existence of skill gaps; training activity. These are all measures of performance that IiP seeks to affect either directly or indirectly.

| | | Accredited | Committed | Not IiP |
|---|---|---|---|---|
| Change in turnover | | | | |
| | Increase | 47 | 46 | 44 |
| | Decrease | 9 | 13 | 19 |
| | Stayed the same | 28 | 26 | 36 |
| Change in Workforce size | | | | |
| | Increase | 27 | 35 | 20 |
| | Decrease | 40 | 50 | 59 |
| | Stayed the same | 33 | 15 | 21 |
| Hard-to-fill Vacancies | | | | |
| | Yes | 26 | 18 | 8 |
| | No | 74 | 82 | 92 |
| Skill Gaps | | | | |
| | Yes | 25 | 40 | 19 |
| | No | 71 | 60 | 81 |
| Arranged Training | | | | |
| | Any off-the-job | 63 | 65 | 42 |
| | Any on-the-job | 80 | 86 | 85 |
| | Both | 65 | 60 | 23 |
| | None | 18 | 10 | 34 |
| *Weighted Base* | | *248* | *130* | *1,269* |
| *Unweighted Base* | | *2,430* | *1,350* | *25,370* |

*Tab. 11 Performance indicators and IiP accreditation (percentages)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF) Base: All employers providing information*

Overall the following points can be made about the relationship between IiP and performance:

- there was little difference between the sales growth performance of IiP and non-IiP accredited workplaces;
- workplaces with accreditation were more likely to have experienced employment growth ;
- accredited workplaces were more likely to experience recruitment problems perhaps reflecting the fact they were more likely to have taken on staff over the last 12 months ;
- skill gaps were reported by a higher percentage of IiP accredited organisations perhaps reflecting the fact that IiP companies had set more challenging performance goals

which, during a transitional period in which those goals are strived for, is manifested as a skills gap ;
– off-the-job training was more likely to take place in IiP accredited workplaces.

A key question is the extent to which these effects are due to IiP or simply a reflection of the fact that IiP workplaces, other things being equal, tend to be either larger workplaces and/or public sector ones.

### 6.2.4 Information and communication technology and e-commerce

One of the foci for the PARTICIPA project was to look at the skills development of technical workers with significant IT skills. The information and communication technology (ICT) industry is typically defined, using the Standard Industrial Classification (SIC), as those industries engaged in activities related to the provision of software and telecommunication services and/or the manufacture of telecommunication or computing equipment. Recent years have seen advances in technology that have merged activities that were once largely separate with a concomitant shift in the structure of industry such that the SIC, arguably, struggles to adequately define the ICT industry. For purposes of this survey respondents were asked to self-define whether they were an ICT industry. Overall, around 4,400 workplaces (15 per cent of all workplaces) in Coventry and Warwickshire, employing an estimated 39,600 people (11 per cent of all employment), considered themselves to be an ICT business. An examination of the number of firms engaged in ICT as a percentage of all companies in a given location, industry, or size band reveals:

– a higher percentage of small (micro-workplaces) were involved in ICT ;
– workplaces in business services, the industry that includes software services, were much more likely to report being engaged in ICT;
– the public sector was much less likely to regard itself as being an ICT workplace.

The overall pattern by employment in ICT is much the same as for workplaces except with regard to industry. Although the transport and communication sector reported a modest percentage of workplaces as being involved in ICT, a relatively high percentage of employment in the industry was in ICT.

#### Occupational characteristics of ICT workplaces

The first following figure shows the occupational distribution of employment in ICT and non-ICT workplaces. Generally, the ICT industry has a more highly skilled workforce with a relatively high percentage of staff involved in both management and associate professional jobs, and relatively low percentages in more low skilled occupations such as personal service and elementary occupations.

The second figure reveals the occupational structure of HtFVs. The occupational pattern of HtFVs reflects the occupational structure of the industry: a large share of HtFVs were to be found in management and associate professional occupations. Approximately 12 per cent of all HtFVs were in the ICT sector. This was more or less in the line with ICT's share of total employment – 11 per cent.

ICT sector workplaces were more likely to report that 'other technical/practical skills' had been difficult to find (49 per cent of ICT companies recruiting compared to 26 per cent of all recruiters), and problem solving skills (25 per cent *versus* 12 per cent).

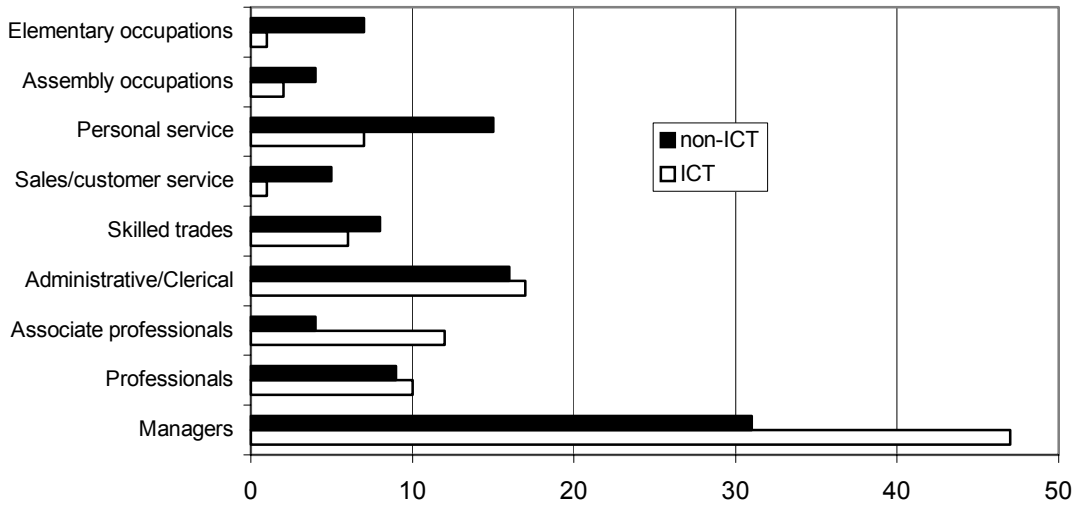


*Fig. 3 Occupational characteristics of ICT employment (per cent)*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF) Base: All employers*

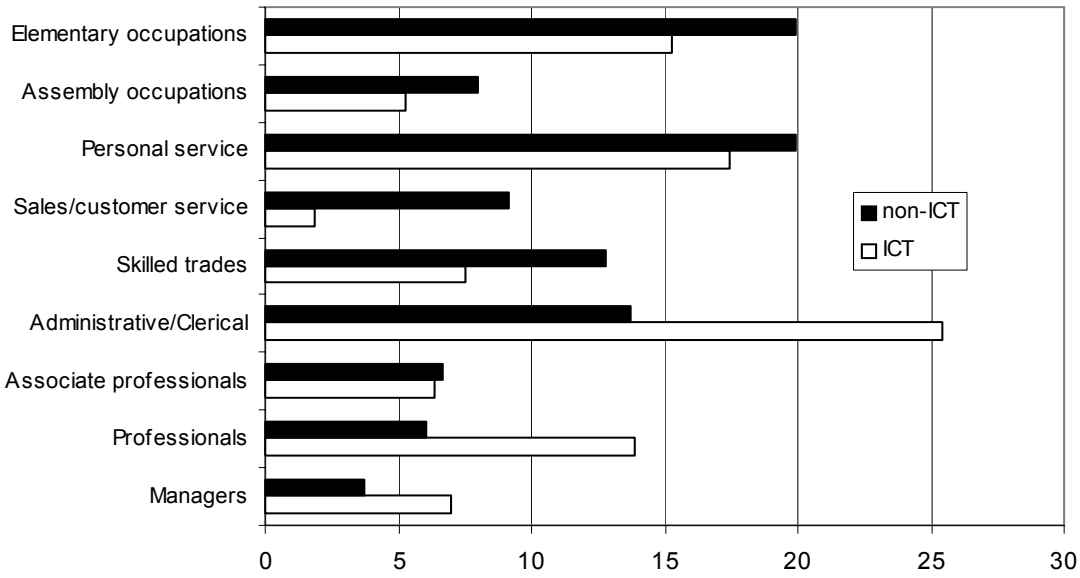


*Fig. 4 Occupational characteristics of ICT hard-to-fill vacancies*
*Source: Coventry and Warwickshire Survey of Employers 2002 (IER/IFF) Base: All employers with hard-to-fill vacancies*

Overall, approximately 15 per cent of companies, employing 11 per cent of the workforce considered themselves to be information and communication technology (ICT) companies (up from 12 per cent in 2001). The internet was available in 70 per cent of workplaces, e-mail in 64 per cent, on-line purchasing in 30 per cent, and on-line sales in 14 per cent. The

extent of ICT use increased with size of workplace. For instance, 68 per cent of workplaces with between 1 and 10 employers had access to the internet compared to 96 per cent with 200 or more employees.

### 6.2.5 Employment characteristics and organisational performance

**The changing character of employment in Coventry and Warwickshire**

Only a relatively short time in the economic past, the economy of Coventry and Warwickshire could be seen as fairly typical of a West Midlands sub-region. Like the rest of the West Midlands, Coventry and Warwickshire's economic prosperity was built on the foundation of manufacturing activity and in particular, the automotive industry. By 2002, Coventry and Warwickshire is beginning to look rather dissimilar to the rest of the West Midlands and is taking on some of the characteristics of the economy of southern England. These changes have not taken place by chance. Coventry and Warwickshire occupies a geographical space adjacent to the South region and the London heartland. The area has benefited from the effects of economic change that has 'rippled' northwards, through Hertfordshire and Oxfordshire, towards the southern-most parts of the West Midlands. This change has been fed by the decentralisation of businesses and population from the South East and been facilitated by improved communications and improvements in local infrastructure.

It is symptomatic of these recent changes that manufacturing in Coventry and Warwickshire, while still important, is now somewhat less important than in the West Midlands as a whole. At the same time, Coventry and Warwickshire has seen rapid growth in service sector activities (such as banking and finance) that are more usually associated with regional capitals (such as Birmingham). Evidence of this can be found in recent growth of head offices in Coventry and surrounding areas. It is the growth of these types of activities that have more than mitigated the decline in the traditional manufacturing activities of the area. Indeed, employment in distribution or in the public sector, education and health now exceed the number of people employed in manufacturing in the Coventry and Warwickshire area.

Earlier Coventry and Warwickshire Surveys of Employers have noted the relatively strong performance of the local economy. To a great extent, this performance results from the kind of changes described above. The latest survey found that over 40 per cent of businesses reported increased levels of turnover/budgets during the past 12 months (and only 7 per cent reported any decrease in business). Comparison over time indicates that businesses in Coventry and Warwickshire experienced a period of economic slowdown during 2000 and 2001 but economic conditions in the area appears to have recovered during 2001-2002 and the proportion of businesses reporting growth in 2002 was comparable to that of 1999.

The Coventry and Warwickshire Survey of Employers 2002 found that employment in Coventry and Warwickshire had increased by twice the national rate during 2001-2002 (1 per cent as opposed to 0.5 per cent). Most businesses expected this situation to continue into the near future, with more than half of all businesses expecting their turnover to increase over the next 12 months. This positive assessment was consistent with employment forecasts of a different kind and source. IER employment projections predict that, com-

pared to 2001, the employed workforce in Coventry and Warwickshire in 2010 will have increased by 3.7 per cent. This is a slightly higher rate of growth than is projected for the UK (2.8 per cent) and quite a bit greater than projected for the West Midlands (1.7 per cent). As always, actual outcomes may differ from those expected as unforeseen global events impact on the UK economy.

**Sustaining business performance**

The relatively strong performance of the Coventry and Warwickshire economy has been sustained by the ability of the area to grow new business in order to replace that lost in its traditional industrial base. The continued prosperity of the area will depend on the ability to sustain such business growth in the future. In the main, the findings from the Coventry and Warwickshire Survey of Employers 2002 lend support to the view that such sustained future growth is feasible. The majority of employers were happy with their present location, foresaw no barriers to future business growth or innovation, had been able to recruit the staff they needed and regarded the great majority of their employees as fully proficient. A large proportion of businesses reported business strategies that involved innovation and improvements in quality while the survey recorded a large increase in the incidence of training activity by employers. While all of this provides a very positive message, it is important not to be complacent. The survey highlighted some issues (such as concerns about location, HtFVs and skills gaps) that may be seen as raising doubts about the ability of businesses in the area to sustain the previously strong economic and employment performance.

Several indicators point to the existence of barriers to future business growth. Around 15 per cent of employers reported some form of barrier to growth while 29 per cent reported some form of barrier to product or service innovation. While difficulty in obtaining the right staff was not the most common barrier to business growth or innovation, it was a more frequently mentioned reason than many other barriers. Around 5 per cent of employers reported having vacancies that they found hard-to-fill because of a lack of skilled recruits, while skills gaps were identified in a number of occupation (such as sales and customer service staff). These difficulties give rise to legitimate concerns over the ability of employers in the Coventry and Warwickshire area to sustain their present strong performance.

Care must be taken when interpreting the evidence of barriers to business growth. The survey found that those businesses that were experiencing barriers to innovation were in fact those that were already innovating. Similarly, those that reported skills gaps and skills related hard to fill vacancies were often those businesses that were performing well. This suggests that employers experiencing these problems were doing so because they were seeking to improve their business performance. They were pushing against the constraints to business growth and were thus aware of such barriers. There is an obvious gain to helping such employers overcome such barriers. But, an equally important question may be why other businesses were not seeking to grow or innovate and thus improve their competitive position. This group of employers would appear not to recognise the need to improve business performance and remain competitive. Appropriate business support for this latter group of employers may be more about raising aspirations and standards and encouraging best practice than it is about addressing specific barriers.

## 6.3 Key findings from survey relating to technical workers' participation in CVET and learning

The local manufacturing base, particularly in engineering, remains important and employs over a quarter of the workforce. Eleven per cent of the workforce consider themselves to be employed in ICT companies. Vacancies among skilled trades occupations were disproportionately likely to be hard-to-fill, with technical skills being in particular demand. Where workplaces experienced hard-to-fill vacancies they had a substantial impact on organisational performance, including difficulties meeting customer service objectives; quality standards; delays developing new products and services; and increased operating costs. The main responses to having hard-to-fill vacancies were to increase recruitment advertising; expand recruitment channels; increase salaries; and increase training (40 per cent of workplaces).

Approximately 20 per cent of workplaces reported that they had a skills gap, that is a gap between the skills possessed by staff and those required to meet the needs of the business. Where staff were not fully proficient this was mainly due to lack of experience in those recently recruited or a failure to develop and train staff. The impact of staff not being fully proficient was much the same as for hard-to-fill vacancies: difficulties meeting customer service objectives or quality standards. Over half of those employers who had staff who were less than fully proficient had responded by providing more training.

About a third of workplaces had training plans and about a quarter had a training budget, with the average training spend being £10,000 a year. The incidence of any type of business, HR or training plan increases with the number of people employed at the workplace. In the preceding 12 months 63 per cent of employers reported that they had arranged or funded either on-the-job or off-the-job training for their staff; this is up on the 55 per cent reported in 2001 and 47 per cent in 2000. Respondents were asked about the barriers to providing training; 36 per cent said that there were no barriers. The most frequently cited reason was the cost of training (17 per cent of all workplaces) which was mentioned more often as a reason by those that actually provided on- or off-the-job training compared to those not providing either form of training. The only other significant responses related to lack of time to source training (12 per cent), or where the workplace could not afford to allow staff to take time off for training (12 per cent). Job specific training, followed by health and safety, new technology and induction training were the most commonly provided forms of training.

Overall the local economy continued to perform quite strongly and barriers to further growth were more likely to be related to recruitment of technical workers than the utilisation of the skills of those employed. Where there were barriers to company growth these were likely to be related to the need for product or service innovation. This means that training was likely to be at most a possible second order issue, following on from changes in product markets or in manufacturing or service processes. Only two per cent of employers considered that staff not being interested in developing their skills was a barrier to providing more training. Certainly for skilled technical workers individual willingness to participate in training was a non-issue. Cost of training, lack of management time to source

training and pressures of work that meant that staff could not be released for training did, on the other hand, act as significant barriers to the provision of more training. It should be remembered, however, that most employers considered that their employees were adequately skilled to fulfil their current range of work activities.

## 6.4 Analysis based on initial scrutiny of interview data

The key point from a review of the individual interviews was whether any particular 'types' of attitudes towards continuing vocational education, training and learning could be identified so as to give further insight into reasons for participation in particular forms of CVET. The data is not yet fully analysed, but three distinct patterns of participation can be identified. These are outlined in the examples given below, and the illustrations are followed by a discussion of some of the implications of the different approaches towards continuing vocational education, training and learning.

### 6.4.1 'Classic example' of participation in formal CVET as an important element for individual progression (in a career that involved working in both large and small ICT companies)

Young female graduate with an engineering first degree started work as a network designer working on data communications in a large telecommunications company. Although this was a technician level post the company recruited graduates to these positions and offered them development programmes that would lead through to positions as a professional engineer. Learning while working facilitated development of her knowledge base on data networks, both from a practical and a development perspective, she also participated in a substantive formal training programme, that led to achievement of vendor (Cisco) qualifications on Networking. She also started on the Institute of Electronic Engineers training programme, with a view to gaining professional Chartered Engineer status. This required keeping a development log, consulting with a mentor and developing a portfolio of work that demonstrated increasing expertise. Hence her commitment to learning and development in a number of forms was very high. A couple of years after achieving professional status she became a technical consultant with a firm of IT consultants. This is quite a popular move early in your career, because it gives you experience of work in a number of different settings while working for clients. It is a way for young workers to build up their experience quite quickly.

After another couple of years she wanted to update her technical expertise and she joined a very large IT company specialising in network developments. She was also attracted by the opportunity to participate in their training programme: she receives training and regular technical updating - the training can take several weeks at a time. The work again involved working intensively with clients.

It is interesting to note that she is pursuing a dual development strategy where she uses formal training to update her technical skills and learning through experience of working intensively with clients as a means of developing her communication skills. As a consequence she has the hybrid skills (high level technical skills coupled with the ability to communicate effectively in the service of business development) that are in such demand in the

IT sector. The mix of bouts of formal training and learning coupled with intensive working with clients gives her very good future career prospects (in the company or elsewhere in the industry

**Reflections on participation in CVET and learning:**

This is a 'classic example' of participation in formal CVET being used as a basis for individual progression. It is also an example of one aspect of a 'typical' technical graduate career in England: moving between jobs very quickly. As well as learning how to apply what they have learned in different contexts, Mason and Wagner (2000) point out that this high degree of mobility helps spread tacit knowledge about working methods.

### 6.4.2 Little participation in formal CVET but then workplace learning is used to transform his work

This individual was working for an engineering Tier 1 supplier as a supply chain facilitator and his work took him into a large number of companies, especially SMEs, in the supply chain. He had worked for the lead manufacturer in the supply chain for 27 years and his most recent previous role was as a senior expeditor in the purchasing department. (Note although he does not technically work for a small company, most of his current work takes place in such companies and his role is crucial in helping improve the business effectiveness of such companies through a commitment to learning and training allied to business development).

For most of his career at the company, after his initial training, he received little formal CVET and learned most of what was required on-the-job. However, the company wanted to transform some of the work processes of companies in its supply chain. This individual was asked if he wanted to play a key role in the process as he already had good relations with a number of suppliers. To start this process he was given five days formal CVT at a workshop where he learned a number of techniques for manufacturing process improvement. This, however, was only the introduction to the process of continuous improvement, most learning would come through working in his new role as a supply chain facilitator. Learning and skill development came particularly through participation in teams focusing upon how to make manufacturing process improvements in practice both in his own plant and in those of a range of suppliers.

The main benefits and highlights from the 'change agent' training and subsequent learning while working included:

- *'What I've gained personally is an understanding of the need for the business to change. My time management was poor but following on from the supply chain workshop I now give people tasks and targets. Also working, with the support of the process engineer who ran the workshop, as a full-time facilitator for 12 months has developed my people skills and greatly increased my confidence'.*
- Completion of accompanying Open University assignments *'have also helped in the development of communication skills: talking with others; reflecting on improvements and writing up the assignments'.*
- Improvements have been made in visual management (of the manufacturing process) - *'we now use a pull system rather than a push system that resulted in queuing'.*

- Achieved set-up reductions (from, for example, almost three hours to less than an hour) where analyses revealed significant down-time. *'We encouraged the whole team and everyone was involved. This was a personal challenge for me as I come from a purchasing background rather than from machining'.*
- *'I am running the second chain network myself with limited support (from the process engineer), just three days per quarter'.*
- worked with a supplier to produce a stabilised kanban system; significantly reduced stock and work in progress and now produce full sets of assemblies in 1.5 days compared to 5 days previously. *'We now produce assemblies for two different products in 3.5 days and the manpower has been reduced from 8 to 5. The other staff being transferred to mechatronics'.*
- Reductions in machine set-up times (by, for example, 40%) - this was particularly important where just one setter was available, because this freed up 8 machine hours per week. This was in a context where it hard to recruit skilled labour.
- The value stream mapping acts to identify non value-added activities and the approach can be used in any environment.
- Involvement of people from all levels from the suppliers. The current and future state mapping on major products could take up to five days and would result in the production of clear action plans. *'The achievement of positive results as a result of counter-measures by the team to reduce waste, change configurations and so on acted to bring suppliers on board as they were involved in sharing and developing ideas in using common tools'.*

The main difficulty was *'the attitude of some people was why do we need to change and who are you to tell us what to do? Rather than telling suppliers we worked with them and gradually mostly overcame initial resistance - the Managing Director in one supplier in particular is now a changed man.'* The philosophy was that *'we are supporting you because we want you there (as a supplier) in five years time'.*

Commitments to sustaining continuous improvement in the short term revolved around getting the supply chain networks to be self-sufficient. Some progress had been made on this with the first supply chain involving ten major suppliers, mainly involving commercial aircraft suppliers. Global industry trends have made a commitment to continuous improvement longer term a necessity. Manufacturers and suppliers cost downs are relentless and this is reshaping relationships. For example, one major manufacturer *'demanded a 30% cost down and we have to get this out of our supply base too. We have tried to involve our suppliers in this process - we have a steering committee of MDs to whom we report on progress. We are introducing lean tools and want others to use these as well.'* They have attempted to integrate their procurement team to include people from purchasing, the site team and CI team. They have 210 suppliers and they expect many of them will also want to be involved. They will support suppliers to develop roll-out plans of where they want to be in the future. They encourage people to train and seek to develop a climate where suppliers will want to be involved, especially now they have examples of how companies save money.

The company had slipped into a 'poor state' and had become very complacent - *'we build the world's best assemblies, so we will be OK'.* But the lack of a business focus meant they were fully taken over three years ago and three painful facts emerged. *'We were not world class in manufacturing and needed to become 'lean'. We were looked upon by our major customer in derogatory terms - we were number 60 in their supplier assessment list, and we only added about 20% in value, the other 80% resided in the supply chain'.* There is now recognition that *'we need to improve overall equipment efficiency by 25-30%'.*

His learning and development was principally rooted in his work. *'My learning and development has mostly been through work: for example, while working as a supervisor on internal progress or through working with suppliers. The regular personal reviews with the process engineer were helpful and it would be useful to continue with the process of reflection and review. I will continue with the NVQ, and the company HR department will pay. I have developed my 'soft skills': teasing out information and being diplomatic. I am also learning new diagnostic tools such as loading capacity analysis. Most of the time I learn by doing, as was the case with my presentation skills. I would like us to achieve a 'creditable standard' and for people [in the company] to respect us for what we are doing. It is good to get some recognition - I was at a trade fair and talking to some people from a helicopter manufacturer about what I did. They were very interested and asked to go down there to give them a presentation.*

*'The change agent training was the most intense I have ever been on - may be better for 3 or 4 days rather than 5. I am now sharing the load with a second person helping to run the second supply chain network. The company has now given a much higher focus to training. Personally I am continuing with NVQ3, but may possibly look at a DMS or moving onto NVQ4 rather than completing NVQ3. The current programme is time consuming but it does help you reflect. My previous learning had been very ad hoc. After discussions with my manager in the appraisal process I might go on a course on Word; Excel etc.'*

*'Although I was originally involved in internal logistics on the shop floor for the last eight years I had worked in purchasing (expediting). This was very important in working with the Managing Director group - it had to be someone the suppliers knew. Trust is a big thing in supply chains. The opportunities for us were in getting costs out, but we offered something in turn. Indeed relations with five companies have resulted in a 50-50 split on savings in the negotiation of a new price'.*

**Reflections on CVET and learning:**

Learning experiences were very rich. They included learning while working in a job with considerable challenges; learning through working with someone with acknowledged expertise; learning through working in multi-disciplinary teams; learning through organised reflection and review; learning through the application of knowledge learned in CVT to work activities; learning through working with suppliers; learning through exposure to other working environments; learning by doing without any formal training (e.g. through giving presentations) are all evident in the above description. This is in addition to what was learned on the 5 day course and through tutor-supported study for a formal level 3 NVQ qualification as a change agent. The combination of different forms of learning is particularly interesting in the above example. It does show how promoting business effectiveness, focusing upon improvements in quality, cost reduction and delivery, with learning and skills development as a means to an end rather than as an end in itself, can stimulate participation by small companies and their employees.

### 6.4.3 Strong commitment to self-directed learning

This individual started out as an electronics engineering technician, who then changed to being an IT technician on the basis of his self-taught IT skills. He worked in both large and small companies. His lack of participation in formal CVET while working for three different employers is coupled with a very commitment to self-directed learning. He qualified as and worked as an electronic engineering technician with a very large telecommunications company that experienced major job losses in the 1990s. For a short time he was employed *'selling computer ancillaries but I wasn't good at that'*. So he applied for a job carrying out electronics repair at a university. However, because the university found it very difficult to recruit IT technicians (pay was very low compared with the private sector), in practice very quickly nearly all of his time was spent helping install computers and problem solving. He had '*had*

*experience of working with things like Excel spreadsheets and such like … and knew quite a lot from reading (computing) magazines, I'd never actually touched a computer (technically) but I knew about it from reading and I've learnt programming and some of those skills plus the electronics were sufficient to get by initially'.*

His job has expanded in terms of the IT part of the job, but also in relation to things like *'for practical reasons very often I find myself representing the department when dealing with other departments and services'.* He is also very much part of a team and the technicians effectively decide among themselves what range of work they will cover and the extent to which they will specialise. For example, he handles PC support for staff. He learns through working and taking on new tasks based around his own interests. For example, he has an interest in maintaining the departmental web site. He has had no formal training in this area and its not his job description. *'It's nothing I'm obliged to do it's just something I feel in a unique place to do, knowing the technical issues involved plus the needs of the department'.*

The breadth of his work activities means he has *'a finger in all sorts of pies, as I mentioned with web development, programming, computer repairs'.* This means he is involved in a range of problem solving activities without specialising *as 'a network administrator or purely a web designer, purely a Unix expert, purely a Microsoft expert and I may not have quite as much expertise as any of them. But I probably come close to most of them and yet I cover all the different bases so I do enjoy having the breadth although at times when you are trying to concentrate on one thing and you're dragged away to something completely unrelated it can be stretching'.*

The best part of the work was solving problems and helping people. *'I like solving problems really and I think being a technician is about solving problems when someone comes to you, you've go no idea about what they are going to say or what they are going to ask. It can range from the trivial to something that is right at the limit or even beyond your scope and often the challenge of solving people's problems is perhaps the highest point of all'.* If he does come across a problem beyond his competence he can use his network of contacts*: 'I do have connections with some people I do know who I can talk to on particular issues, so I do liase with other colleagues when I can'.* He also has a particular colleague upon whom he could draw informally for support: *'he is sort of a similar ability and work type to myself'.*

He has had virtually no training or professional development in his role as an IT technician. He attended one short course on Windows 2000. However, generally he does not ask to go on such training courses because he does not really believe in the value of many formal courses: *'I am not convinced of the value of training courses, typically the good ones are about £350 + vat a day and it's arguable as to whether you learn anything that you couldn't have learned in a £35 book on the subject'.*

There has been relatively little support, except that '*very peculiarly this year there was centrally to the university everyone was given up to £300 to spend on personal development whether it be on courses, I like many opted for books so I bought quite a few technical books'.* He tended to be self taught and his style of developing knowledge was *'either buy books or get knowledge from scouring the world wide web nowadays'.*

He sees himself staying with this type of IT support work: *'I think that is where my gifts lie and you should stick with what you do best… I get a lot of pleasure out of helping people and getting, or teaching them in a way. I don't just like to walk into a room fix something and walk out, it's nice to communicate the reasons why they are having a problem or how they can convert their documents from one format to another or whatever'.* He sees his work as having an educative role.

**Reflections on CVET and learning:**

Learning experiences are very rich. They include learning while working in a job with considerable challenges and through solving problems; learning by doing without any formal

training; learning and technical updating through self-directed study (using technical books and through searching the Internet) are all evident in the above case. His non-participation in formal CVET is partly based on his values (he thinks most IT training is a 'rip-off') and his own preference for learning from books, through engagement in problem-solving at work and talking things through with people. He is someone working in IT support who is a self-directed learner, keeps technically up-to-date and actually likes communicating with and helping people will be high on an employability scale, even if he does not participate in formal CVET.

### 6.4.4 Discussions on the different approaches towards continuing vocational education, training and learning exemplified in the initial interview data

The above interview exemplars show that when examining the full set of interviews it will be possible to identify not only factors influencing technical workers' participation in CVET and learning, but also to generate exemplars of the effectiveness of different approaches and combinations of continuing vocational learning. The interviews outlined above have already highlighted the significance of the interaction between formal and informal approaches to learning, skill development and knowledge creation. In particular, the interviews will allow a commentary to be developed on participation in continuing vocational education, training and learning being linked to certain work roles, contexts and individual characteristics. The full set of interviews have covered individuals participating in certain types of substantive continuing vocational learning as well as on the learning and development of individuals not currently involved in major CVET programmes. Interviews have been conducted with individuals from at least the following three groups, who are:

- participating in a mixed programme of development with some formal workshops but mainly through learning while working in carrying out new roles such as supply chain facilitators
- participating in lengthy formal programmes of continuing vocational education and
- development (a two year part-time Master's programme on engineering and business management);
- working in technical roles, but from whom we have sought to uncover the extent to which they engage in substantive learning and their pattern of learning and development.

There is also a broad theme that emerges from the above data presentation and that is that we need to be able to represent participation in work-related learning as a social activity not just an individual decision. This is a theme that is expanded in the next sub-section.

### 6.4.5 Participation in work-related learning as a social activity

Employees are not just reactive to training opportunities and the strategies of trainers and managers, they may also be organisers of their own learning (Poell, 1998). Furthermore, given the structure of social relations at work, learning may also often be a collective activity grounded in working practices rather than comprising predominantly individual effort on continuing vocational training programmes taking place away from the workplace. The social nature of work-related learning and knowledge development is perhaps most clearly

evident in those cases where an individual forms a close attachment to her or his immediate work-group. This not only draws attention to the social context in which knowledge is acquired, developed and applied, but also how influences the processes by which the individual learns. Indeed the basic structures for the interpretation of experience, although based on idiosyncratic frameworks that at the same time favour and limit the individual process of sense-making (Resnick, 1991), can themselves be shared, developed and changed through interaction with other members of the work-group (Brown, 1997). Individuals learn what type of learning will be useful to share with colleagues, and they also learn about where and from whom further knowledge could be gained.

A classic example of this and one directly relevant to our PARTICIPA project is how photocopier repair technicians learn to become more effective in repairing faulty machines. The social nature of work-related knowledge is stressed in the cultural-anthropological perspective. For instance, Orr (1996) analysing the working behaviour of work groups for repairing photocopiers, shows that these technicians develop their knowledge over time through problem-solving and continuous interaction. The defects of the machines they have to cope with are often very different to the ones reported in the standard operating manuals. Therefore problem-solving and problem-setting happen collectively on the basis of previous experiences of each member of the group and on the basis of various types of communication, even the informal chatting around the coffee-machine. This way, knowledge is continuously created and maintained within a specific community of practice, having its own language and myths (developed partly through the handing down of war stories, reporting the main events of machine repairing and client dealing). In this way individuals can learn from the experience of others, but they also need to be able to direct their own learning such that they can make contributions to these knowledge development and sharing activities. Participation in formal training plays only a small role in the early stages of the introduction of new machines, after that learning and development is collectively organised around experience and working practices.

There are also increasing examples of where, because learners were working in teams at the workplace, these teams became a focus of support for learning (Infelise, 1994). The social context created by a co-operative approach can also enhance the motivation and commitment of the learners. In this way collaborative learning can not only help individuals to transfer their skills, knowledge and understanding between contexts, but also expose individuals to different strategies for making these connections. Overall then, involvement with and commitment to a work-group may influence individual commitment to all forms of learning at work, including self-directed learning.

The social influences on individual commitment to learning at work can emanate from membership of particular work-groups or teams. The focus and ideas about learning arising from such groups often relate to experience, practice, knowledge, development and understanding applicable to the immediate circumstances and contexts of action. The emphasis is upon the development of interpretative thinking related to current practice, rather than developing a capacity to think beyond this and in terms of extended generalised action (Lave, 1993). Communities of practice are tautologically mainly focused upon the concerns of practitioners as a collective group. However, other people may also influence an individ-

ual's commitment to participate in substantive learning at work through a one to one relationship. Eraut et al (1998a) found many examples of organised but relatively informal learning support through reference to unofficial sponsors, mentors or 'designated experts', where the support was a function of a personal network of relationships. In such circumstances know who is a kind of knowledge which is becoming increasingly important. This know who refers to a mix of different kinds of skills, in particular the social skills, allowing the access and use of knowledge possessed by someone else, often through a combination of professional and personal networks (Eraut et al., 1998b).

Individual commitment to participate in substantive work-related learning is mediated by the perspectives of others about what should be learned and how it should be learned. The nature, direction, extent and commitment of an individual to learning at work can be strongly influenced by the set of social relationships that an individual has with others at and through work. The full analysis of qualitative material will be used to exemplify case studies of companies and individual life histories that will be reported in a subsequent phase of the research (in PARTICIPA Findings volume 3 of the Bremen ITB Working Papers Series).

## *6.5 Analysis of data generated from initial focus groups*

Two initial focus groups were held with a range of people drawn from the IT industry. One of the most obvious factors influencing participation in ICT CVET is gender. As a consequence one of the major issues for employers and training organisations is how to get more women participating in working and learning in ICT. As a consequence the two focus groups considered issues around education, training and learning and recruitment into the IT industry and how to attract more women into IT. One of the two employers at the focus groups was a director of a small software house employing about 30 people in Coventry and Warwickshire. There was also a representative from a national ICT training organisation plus a female psychology graduate recruited on the strength of her communication abilities and who then received the necessary technical training. There were also three students who were considering the possibility of entering the industry. The data generated could be grouped into a number of related topics.

### 6.5.1 Recruitment into the IT industry

The focus group sought to address issues relating to recruitment into the IT industry. Of particular concern was the shortage of people with the appropriate skills and experience in the industry and the need to understand more about the reasons why people do or do not choose to work in the industry. One of employers thought that in certain respects there was an inter-related problem of image both about the work and those who do the work. The stereotype was of a person with very poor social skills who sat at a computer all day writing code: a person happier interacting with computers rather than people (disparagingly often called a 'nerd'). This image then put off many graduates even considering work in the IT industry. One graduate pointed out that this image was partly borne out from coming across computing students who did 'virtually live in IT labs and whose only extra-curricular interests appeared to be playing computer games and talking to others about computing.

Personality and attitudinal factors were therefore viewed as fundamental as to why many people entered the ICT industry in the first place.

The employer who ran a small software house admitted though that there was a problem in that there was little incentive for such students to change given that all IT-literate students were likely to get well-paid jobs in any case. (Although since early 2002 the labour market for ICT technicians has become much more competitive.) Also she felt that the IT industry in general, and her company in particular, did still needed people who would be basically happy with programming day after day. They did have to be part of a team in so far as they had to be able to link back to the project leader and follow clear programming guidelines so someone else would be able to pick up the coding from where they left off. However, these minimal requirements were sufficient for some team members. They certainly did not need highly developed communication skills and would not deal with clients.

On the other hand, the other stereotype was of the IT consultant: very mobile, very highly paid moving from working with one major client to another. All those involved in IT recruitment bemoaned the lack of breadth and depth to the picture of the IT industry among many graduates that did not consider the huge range of opportunities between the poles of coding and consulting. This was contrasted with the very high profile given to companies working in accountancy, finance and management consultancy, even though many of the jobs in these sectors were underpinned by the need for significant IT skills. Another key factor that was not explained was the varying degrees of technical specialisation required in different types of employment in the industry.

Interestingly, some of the large 'blue chip' ICT companies used involvement in state of the art development work, either on an extended work placement while a student or through an initial work placement as an employee, as a 'hook' with which to attract what they perceived as the 'best' students. Placements in company research laboratories were particularly likely to be used in this way. Taking advantage of such opportunities tended to put individuals on career-track employment within the industry: even though the career might involve horizontal development within a variety of project settings rather than the classic hierarchical progression.

Large employers were comfortable with handling students with well-developed technical and communication skills with aspirations to develop company careers (even if the nature of these careers was different from the classic organisational careers of twenty years ago). However, the national training organisation representative pointed out that there were also some people with skills in such high demand (e.g. in relation to Internet development) that large companies were willing to consider a variety of arrangements in order to get the services of such staff. For example, there was a perception that such people were not necessarily attracted to work in large formal settings and that they preferred work in smaller development settings where the challenging nature of the work itself was the decisive factor in recruitment. The larger company could then sub-contract work, and in some cases it might take a stake in the smaller company.

Many jobs in the industry require a mix of technical, information-handling and people skills, with critical reasoning being particularly important. The industry as a whole, and in-

dividual companies, are adopting more strategic approaches to the recruitment of graduates, but there are continuing problems with recruitment of technicians in IT service companies. For graduate recruitment greater emphasis is put upon the project nature of much work which requires team members to have differing mixes of skills. Such graduates were seen as likely to have access both to formal CVET and opportunities for considerable learning while working. Recent graduates are also being used directly in recruitment processes, including giving potential recruits the opportunity to work-shadow them. There are also short formal IT insight events where potential recruits, new graduate employees and employers are brought together. The application forms are increasingly designed so that candidates are asked for examples of the use of their skills in different contexts.

The recent graduate pointed out how her employer is moving from providing IT to creating 'tailored' business systems. Hence people skills have become much more significant, as staff have to be able to approach corporate customers, understand their needs, then be able to liaise with their own technical staff in order to produce the required solution and then support the customer through to full implementation. The company requires potential recruits to attend a two day assessment centre where the focus is upon possession of the necessary 'soft' skills and demonstrating a willingness to and aptitude for learning sufficient technical skills. The company will recruit students from arts and humanities backgrounds with the requisite people skills but without technical skills rather than technical graduates without the necessary 'soft' skills. The rationale is that the former can learn technical skills whereas it is more difficult for the latter 'to learn a new way of being'.

### 6.5.2 Organisation of work

The small employer remarked that the very strong labour market position of programmers (until recently) had made many of her programmers very complacent and they adopted a very bureaucratic approach to their work. They followed the rules, did what was required of them during work-time, but would only ever work their required hours 9-5.30. Their organisational commitment clearly revolved around the wage-work nexus and there was little extra attachment or involvement.

The second employer stressed that there is increasingly a need for a diversity of skills within teams. For example, in any team you will need some people with flair, but you will also require completer-finishers those who will see tasks through to completion. Even for the former you may require technical flair, editing capability and design creativity in, say, website development. It is important that those who are not technical specialists nevertheless do not have a fear of the technical side, and that the technical specialists have a desire to communicate. When working on team-based projects flexibility in work is also a key requirement. In return for this flexible commitment, some employers are trying to be more flexible on their own part. For example, IBM are stressing that they believe that their employees should have an appropriate work-life balance.

### 6.5.3 Women into the IT industry

Individual employers, and the industry as a whole, are making great efforts to recruit more women. Continuing skills shortages and skills gaps make this imperative. Many of the re-

cruitment initiatives mentioned above recognise this too. The major company switching from IT support to provision of complete business solutions argued that women graduates are seen as likely to be good at facilitating team-work and multi-tasking, but the key skill is being able to put themselves in the minds of the users. That is, not thinking of themselves primarily as technical specialists actually helps them in dealing with corporate clients. Similarly, communication and analytical skills need to be applied to the 'big picture' of how systems are operating and the role of any new IT tools needs to fit into that picture. In the past (predominantly male) technical graduates used to approach clients from the perspective of what the new tools could do. Now the company wants people able to empathise with the client, who are more approachable and can say what is required simply, rather than getting caught up in jargon.

### 6.5.4 Discussion

It is noticeable from the evidence presented here that participation of technical workers in the full range of continuing vocational education, training and learning activities is quite rich compared to the population as a whole. What does the other evidence say? For example, Sargant (2000) analysing a NIACE survey of over 5000 adults showed considerable inequalities in participation in learning, with the least likely to have engaged in current or recent learning being:

- Older individuals - participation reduces significantly with age, with, for example 41% of those aged between 45-54 participating in learning compared to 70% of 20-24 year olds.
- The economically inactive - with 30% participating compared to 50% of those in jobs .
- Skilled, semi and unskilled working class - with around 30% participating compared to 51% of the lower middle class .
- Those who finished their initial full-time education at the earliest age - with less than 20% participating compared to 58% of those who completed their full time education aged over 18.

On the other hand, Sargant (2000) identified the key barriers that resulted in non-participation in learning as:

- Not interested / don't want to - 27% (attitudinal)
- Work / other time pressures - 17% (physical and material)
- Too old / ill / disabled - 15% (physical and material)
- Childcare / caring responsibilities - 8% (physical and material)
- Cost - 7% (structural).

NACETT (2000) also identified a number of barriers to increasing both the overall skills and qualifications of the workforce and reducing the inequalities in learning participation of adults. It concluded that adults face barriers such as lack of finance, lack of time and early unhappy learning experiences. Hillage et al (2000) thought that individuals who were seen as 'non-learners' could be split into two different groups:

- Individuals that would like to undertake learning but are unable to do so because of external barriers;

– Those that do not want to engage in learning, through lack of confidence, motivation and disaffection.

Hillage et al (2000) further believed that the barriers to learning could be categorised as:

– Physical and material - e.g. finance and time
– Structural - around the way education and training is provided
– Attitudinal - including confidence and motivation.

Now it is striking that technical workers typically engaged in significant learning activities as part of their job and so even where they did not participate in formal CVET it was unlikely that they could be regarded as 'non-learners' in the more general sense. When these workers did not engage in formal CVET it was most likely either because of factors associated with training supply or a perceived lack of time. Although from the interview data it was also clear that attitudes towards participation or non-participation in CVET could be shaped by prior learning experience. The lack of motivation being likely to reflect a reluctance to engage in formal training rather than a lack of interest in learning.

Spilsbury's (2001) analysis of the Learning and Training at Work survey highlighted that in 2000 24% of employers had not provided any on-the-job or off-the-job training in the last 12 months. On-the-job training is defined as that provided to an employee at their usual work position whilst off-the-job training is defined as that provided away from the immediate work position. By far the most commonly stated reason for not providing formal workplace training was that the existing skills of the organisation's workforce was felt by employers to be sufficient to meet business needs (77%). There is therefore a symmetry with attitudes of employees and both may consider that learning is significant even if there is relatively little formal training. Stern and Sommerlad (1999) suggest that informal learning, the transmission of 'tacit' knowledge, relating to the transfer of technical know-how, knowledge about markets or customer requirements and other forms of business-related knowledge, are generally seen as more relevant to the needs of small and medium size enterprises than more formal training. Such learning may take place while engaging in normal work activities.

On the other hand, there is considerable qualitative evidence to reinforce the fact that skill shortages and skill gaps are highly diverse and specific to particular sectors and groups of the workforce. However, there appears to be a degree of concentration in two occupational groups in particular - associate professional and technical and craft related (Campbell et al, 2001). Also although there is evidence that less formal modes of learning can be very important, it is often the case that learning at work hampered by lack of organised learning support. Eraut et al (1998a) investigated the extent of organised learning support in the development of knowledge and skills in employment of 120 people operating at professional, management, team leader or technician level in 12 organisations. The organised learning support included use of mentoring and coaching; rotations, visits and shadowing; as well as reference to 'designated experts', although very few of the positive examples of learning "resulted from organisation-wide strategies or initiatives. Most were relatively informal and initiated by middle managers, colleagues or the learners themselves" (Eraut et al, 1998a, p. 41). On the other

hand, "negative examples where the absence of these kinds of organised support for learning on-the-job left people struggling were too numerous to count" (p. 41).

### 6.5.5 Conclusions

From the survey of employers in Coventry and Warwickshire it was very clear that employers required increased levels of technical (practical and ICT) skills, although for technical workers these may be allied to the need to improve other skills such as communication, customer handling, flexibility and personal skills. Employers reported there were barriers to providing more training but they were not linked to staff attitudes: lack of interest from staff was consistently seen as of little importance (never cited as a barrier by more than 2% of employers). The barriers to providing more training were more likely to be the cost of training; lack of time to source training; or where the workplace could not afford to allow staff to take time off for training. The key point here is that the reasons technical workers do not participate more extensively in training provided by their employers are much more likely to relate to supply, cost and management issues than individual factors.

Overall, companies in the local economy continued to perform quite strongly and barriers to further growth were more likely to be related to recruitment of technical workers than the utilisation of the skills of those employed. Where there were barriers to company growth these were likely to be related to the need for product or service innovation. This means that training was likely to be at most a possible second order issue, following on from changes in product markets or in manufacturing or service processes. Certainly for skilled technical workers individual willingness to participate in training was a non-issue. It should be remembered, however, that most employers considered that their employees were adequately skilled to fulfil their current range of work activities.

From the types identified in the initial analysis of the interview data it is clear that technical workers do have very different approaches to learning and development. Three strands of typical development could be identified, according to whether greatest use was made of formal CVET provision; opportunities for learning while working; or self-directed learning. The interview data showed some individuals made regular use of formal CVET provision, with courses lasting from a few days to several years. The longer courses, such as Master's programmes, were often taken in an individual's own time. The second group mainly took advantage of learning while working. Indeed the interviews highlighted the rich array of learning experiences that could be utilised if work itself was challenging. This included learning while working in a job with considerable challenges; learning through working with someone with acknowledged expertise; learning through working in multi-disciplinary teams; learning through organised reflection and review; learning through the application of knowledge learned in CVT to work activities; learning through working with suppliers; learning through exposure to other working environments; learning by doing without any formal training (e.g. through giving presentations). The third group made use of self-directed learning that remained outside either formal education or training and did not take place at work. Here learning and technical updating was accomplished through self-directed study, for example, using technical books and through searching the Internet. Another means of learning was through personal networks, where for example two or more techni-

cal staff from different departments or companies would regularly meet socially but also use the occasion to discuss their work. This could specifically include discussions about new developments, different ways of approaching problems or reflections upon work processes.

In practice, many people use all three forms of learning. Additionally, it was striking that some of the most successful forms of learning identified in the interviews occurred when the aim was improving business effectiveness, through a focus upon improvements in quality, cost reduction and delivery. In these cases learning and skills development was seen as a means to an end rather than as an end in itself. It was also noteworthy that such approaches could stimulate small companies to pay more attention to processes that led to significant employee skill development. The next stage of the project will investigate these issues further through the use of case studies.

The interim conclusions of the UK arm of the project are:

- In contexts where technical work itself is challenging, then most continuing vocational learning takes place outside formal training programmes.
- There is a need for employees not only to update their technical skills but also to develop further a range of more generic skills, including planning, problem solving, communication, IT and management skills.
- Learning to become more self-directed in your approach to learning can lead to significant work-related learning.
- Use of personal networks can be an effective way to critically reflect upon work and hence can be an important source of work-related learning.
- Learning how to support the learning of others (especially for those with management and supervision responsibilities) is vital to improve the likelihood of significant learning while working.
- Learning how to organise knowledge effectively and apply it appropriately is vital
- for technical workers development.

These interim conclusions lead on some ideas for recommendations for CVET policy and practice. These are:

- The focus of strategies for skill development should be upon continuing vocational
- education, training and learning, rather than just upon participation in CVET per se.
- Greater attention should be given to helping employees become more effective in
- supporting the learning of others at work.
- There is a need to focus upon the development of hybrid skills rather than just
- technical skills development. Hybrid skills refer to the ability of people to harness
- technical skills in support of business development.
- Encouraging the spread and sharing of tacit knowledge, through a combination of
- individual mobility and formal and informal networks, will increase the competitive-
- ness of companies in particular districts or sectors.

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# 7 Conclusions on CVET Participation – ISSTAL, continuous education, learning and beyond

The common denominator for the design of the surveys carried out in the different countries was the ISSTAL model as presented in the introductory chapter. Within the research process of the PARTICIPA project it soon became clear that the model was more appropriate for some countries than others with regard to the overall research approach and methodology. The Spanish and the Portuguese research teams stuck to the main lines of the framework provided through ISSTAL, while the German and Greek teams operated with the model to some extent. However, the British and Italian research teams structured their research using just the topics of the model because based on their expertise on learning within the different sectors they felt that there were more appropriate research paradigms.

As often in comparative research a very rigorous approach adapting one model and then testing this out under different conditions is almost impossible because of the strong interrelatedness of different factors and variables to be scrutinised within learning 'cultures'. Those interrelations build complex patterns of participation in Continuing Vocational Education and Training (CVET) that can hardly be depicted in linear models such as ISSTAL. At the very least researchers would risk overlooking very important features of patterns of CVET participation in different cultural settings, if the model was applied exclusively to their respective realities.

In fact, the whole idea of *Continuing Vocational Education Participation* is a concept which needs to be adapted to a changing conception of learning and knowledge in which the orientation towards competence development and the integration of learning and working (including through the use of informal and non-formal learning) are more than the buzzwords of a new European hype and contemporary educational policy: The paradigm of enrolling, participating through being taught and taking home a qualification makes way for a more fundamental conception of learning, which sees potential for learning in all kinds of different human activities, among which work naturally still plays a significant role. Learning therefore is not bound to venues devoted to learning but happens or can happen incidentally as well as systematically integrated into work processes. The respective outcome, then, is the development of a skill or a competence, an ability to perform a specific function or activity necessary to fulfil one's job as long as we are talking about *vocational* learning.

This dichotomised view of course finds no equivalent in reality, but shows the field of tension as a ground on which the members of the project design and discuss their research procedures and methodologies and results. Nevertheless, it is possible to relate the results achieved through the quantitative investigations within the PARTICIPA project to the frame given through the ISSTAL model. Relating findings to the model, then, also shows where there might be more appropriate ways of conceptualising learning in and for work processes. After summarising and comparing the main findings of the quantitative part of our common study, we will stress some ideas for the further investigation of continuous learning processes in and for work across Europe and draw some conclusions for practices and policies for lifelong learning.

## 7.1 Summary of findings as related to the ISSTAL Model

Within the Spanish setting the research findings show the greatest accordance with the original model. *Intellectual activities, psychological functioning, beliefs and values*, *images of learning* and *access to training* are the predictor class dimensions that most influence participation in continuing vocational education and training activities. In the Portuguese setting the variables *images of learning*, *intellectual flexibility*, and *experience* exert the strongest effect on participation. In contrast to the original model *retained information* and *attitudinal disposition* showed a strong effect.

The German study was based on the assumption that in addition to the ISSTAL model, there might be significant differences between the two sectors investigated. In fact, participation in the IT industry is significantly higher then in the aeronautics industry. The main motivation behind participating in CVET is strongly connected to job needs and is especially targeted at widening the occupational horizon. In principle, respondents found that there is a good alignment between their own expectations and the courses. The courses are assessed in general as contributing to an improvement of their occupational knowledge and skills. That results in an overall good assessment of the quality of courses and instructors. The survey shows that there is a high acceptance of and positive attitude towards CVET in general. Respondents are particularly aware that lifelong learning is a precondition for coping with the demands of jobs in the IT field. It fits well into this scenario that the management of enterprises is rather seen as a promoting factor for CVET participation. Major obstacles against CVET participation are too high costs and settings with a too heterogeneous audience.

Even though formal CVET measures play a significant role in the IT sector, more informal ways of learning, such as learning at work, learning through self-study and learning from peers are significant. However, there is also a huge amount of indifference when looking at the results for those informal learning strategies. A strong advancement orientation and a dimension which we called coping optimism or self-reliance are traits of the respondents who exemplify a typical attitudinal pattern in the IT sector. It became visible that the advancement orientation is spread especially among those with lower educational credentials. In general it can be said that the German results exemplify a strong influence of the situational variables which are rather located at the right hand side of the ISSTAL model outlined in the introduction. The research in the German setting also illustrated the strong influence of social background and social roles as classical insights of research into participation in CVET. This was especially highlighted through the regression analysis.

Within the Greek setting the social and background roles also play a significant role. Whilst the general CVET participation is particularly low as opposed to general participation in education, the participation of the unemployed is very high. This gives an insight into the main targeted population to which CVET measures in Greece are addressed. In general, this population recognises the value of CVET in helping them to advance their careers. According to results of the Greek statistical office women, young people and more educated people have higher chances to participate in training. Moreover, employees in large companies and employees of the public sector participate more often in training. It is also

shown that part-time employees and temporary employees participate in training at higher rates than other employees. In general training is supposed to have a beneficial effect on the individual careers of participants. Summarising, it can be said that it is especially social background and organisational characteristics that influence participation in training. A big obstacle to participation is the size of the respective SME. That holds, too, for the German setting. As results for the German as well as for the Greek study we can therefore say, that within the framework of the ISSTAL model, it is social background as well as situational variables which demand further attention.

As already mentioned above, the British and the Italian research teams adapted the original research design to the greatest extent, since this was appropriate for their contexts. Both contexts have in common, that studies were carried in sectors and enterprises particularly affected by global competition, special market dynamics and technological change. This has led to new patterns of occupational work and a strong requirement for employees to constantly update their knowledge and skills. Job enlargement, team processes, decreasing hierarchies are phenomena which can be observed increasingly. All of those processes set the scene for a significant mismatch between conceptions of learning based upon attendance at formal events and learning as a continuous activity within work processes. Therefore, professional experience is rated high as a fundamental pre-condition to successful CVET. Initial vocational education is seen as only a very partial preparation for working life. In the two Italian sectors a 'dialectical' relationship can be identified between the more 'formal' and more 'informal' drivers of learning and knowledge acquisition.

Within the British context similar results were found: especially in those contexts, where the technical work itself is very challenging, the most continuing vocational learning takes place outside formal learning settings. In addition to the development of specific technical skills there is also a need for employees to develop more generic skills, such as planning, problem solving, communication, IT and management skills. To make effective use of the potential for workplace learning it seems particularly important that employees become more self-directed and use personal networks for critical reflection on their role in work processes. For those responsible for the learning of staff it becomes an important managerial skill to support the learning of others through confronting them with significant work tasks and helping employees develop support networks.

## *7.2 Conclusions for further research*

In the Spanish and Portuguese settings it was found that the ISSTAL model may serve as theoretical frame to study and analyse relationships between a set of characteristics and aspects and participation in training activities of the technical workers. Some of the deviations from the model might be due to the different interpretation and perspective concerning dimensions and their indicators and/or characteristics of the context, the first class of variables considered in the ISSTAL model, as stressed in the Portuguese study.

In the Greek and German settings those variables categorised under social background variables and the situational variables were found to have major effects on CVET participation. That social background plays a major role for participation in and success of further learning activities is a well-known fact across Europe. As a result it might be more interest-

ing to find explanations for the significance of the situational factors. Situational factors are also very much stressed in the British and Italian studies. For that reason within the framework of the project a number of more qualitative methods and approaches are planned, ranging from one to two sectoral case studies per country to records of 'life histories' and expert interviews. In some countries those methods have already been applied in preparation to the quantitative study and parallel to it, in other countries qualitative investigations are only part of the last research phase. Those case studies will illustrate on the organisational and the individual level what factors contribute to continuous learning and how CVET is put in place in economically successful and dynamic SME environments. They also seem to be very interesting with regard to the polarity of more formal and more informal 'drivers' of CVET, what can be learnt in work processes and which knowledge and competences can be better acquired through other forms of learning.

## 7.3 Political Conclusions

At this state of the project we cannot provide the reader with a comprehensive set of policy conclusions. However, a number of directions for such conclusions can already be drawn. CVET is not only taking place in 'formal' learning environments, especially not when the underpinning concept of CVET follows modern ideas about education and learning for and in work. This should be taken into account by policies trying to tackle the special problems of a deficit in CVET participation among technical workers in SMEs, which can be found across Europe. SMEs struggle with particular structural problems across Europe. Policies of CVET participation should be broadened towards policies for enhancing continuous *learning*.

### Individual learners

With regard to individual learners the following preliminary conclusions can be drawn: within the framework of the ISSTAL model *images of learning*, *intellectual flexibility* and *experience* have been identified as dimensions which are of particular importance for CVET participation. Experience as a factor points to the importance work can play as a learning catalyst. This has been stressed in all the different contexts investigated, be it through the learning potentials of communities of practice, the incidental acquisition of 'tacit' knowledge or the learning conducive character of particular work tasks. Another important issue relating to individual learners in CVET and their relationship to work is that there is only a weak relationship between the actual advancement after participation and advancement as a possible motivation for technical workers. All of this has to be taken into account by policies which aim to increase learning and CVET participation for technical workers from SMEs.

### Content and forms of learning

The needs of individual learners should be also taken into account with regard to the content and forms of learning. With regard to the content it is more and more competences instead of qualifications which are demanded by employers. Those demanded competences are made up of a set of hybrid skills which refer to the ability of people to harness technical skills in support of business development, as is stressed in the German study, and even

more strongly by the Italian and the British studies. Encouraging the spread and sharing of tacit knowledge, through a combination of individual mobility and formal and informal networks, will increase the competitiveness of companies in particular districts or sectors. But also the direct effect of *retained information* and *attitudes* on CVET, as found in the Portuguese setting, points towards this direction. The need for these hybrid skills or competences should also be reflected in modern occupational profiles as well as measures of accreditation which could improve the quality of programmes as mentioned in the Greek report.

A very important factor influencing CVET participation of technical workers from SMEs is the information on CVET and possibilities for continuous learning available to them. There are many conceivable ways of how to tackle this by appropriate policies. One rather indirect, but very important, policy would be to put a stronger emphasis upon equipping workers with some kind of learning awareness so that they can become more effective in supporting the learning of others at work. In addition companies should make efforts not only to reduce participation barriers but also to implement incentive strategies emphasising the role of training for job performance.

With regard to the 'loci' of learning these should be clearer focused by policies upon what can be learnt in practical work and what can be learnt through utilising other forms of organised learning support. Co-operation can then be based on the respective strengths and weaknesses with regard to learning at different sites or through different forms (such as e-learning etc.). The pre-condition for this is a close dialogue between SMEs and CVET providers.

Summarising, policies for promoting quality in CVET should be developed and integrate incentives to make employers and employees aware of the role of training for job performance and of the need for self-directed learning in work processes in addition to participation in CVET courses. A new CVET policy perspective should be based on new forms of reciprocal recognition between the training world and the productive world. It has to be based on lifelong learning attitudes, which have to be carefully built not least through learning and education policies and practices. These kind of policies acknowledge the close relationship between innovation in companies, learning and professionalized learning support.

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