Participation in continuing vocational education and training: results from the case studies and qualitative investigations

Brown, Alan; Grollmann, Philipp; Tutschner, Roland

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Alan Brown, Philipp Grollmann, Roland Tutschner
& PARTICIPA Project Consortium

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Alan Brown, Philipp Grollmann, Roland Tutschner
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Am Fallturm 1, 28359 Bremen
Tel. +49 (0)421 218-9014, Fax +49 (0)421 218-9009
itb@uni-bremen.de

www.itb.uni-bremen.de

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Introduction

The main objective of the PARTICIPA project is the investigation of factors influencing the continuous vocational education, training and learning (CVETL) activities in the six partner countries Portugal, Spain, Greece, Italy, United Kingdom and Germany. Roughly, the project can be divided into two periods, in which the objectives were approached with different methods and research designs, namely, quantitative and qualitative methods, which were expected to complement each other.

In the previous research phase the PARTICIPA project partners have investigated the participation in CVETL of skilled technical workers by means of quantitative research methods. The theoretical framework of these quantitative investigations was the ISSTAL[1] model of social participation developed by D. H. Smith (Smith & Macauly, 1980). This model was the frame of the partners' studies, which are presented in detail in the second report. Subject of the studies were two sectors. The ICT sector, with its increasing importance in the European economy and with its strong impact on other sectors, was investigated by all partners, whereas the second sector was chosen by each of the partners separately according to its regional importance. The findings of these quantitative studies were presented in detail in the second report (Brown, Grollmann, Tutschner, & PARTICIPA Project Consortium, 2004).

At this place we would like to outline the findings of the second research phase, that is, the results generated by a number of case studies, and to discuss them in comparison with our previous quantitative results, which shall therefore be summarized briefly.

Within the Spanish setting the research findings have shown the greatest accordance with the ISSTAL model. *Intellectual activities*, *psychological functioning*, *beliefs and values*, *images of learning* and *access to training* are the dimensions that most influence participation in CVET activities. In the Portuguese setting the variables *images of learning*, *intellectual flexibility*, and *experience* have exerted the strongest effect on participation. In contrast to the original ISSTAL Model *retained information* and *attitudinal dispositions* showed a strong effect. In the Greek and German setting those variables categorised under social background (e.g. age) and situational variables (e.g. immediate job demands or financial support) were found to have major effects on CVET participation.

Situational factors were also very much stressed in the British and Italian studies. The British and the Italian research teams carried out their studies in sectors and enterprises particularly affected by global competition, special market dynamics and technological change. This had led to new patterns of occupational work and a strong requirement for employees to constantly update their knowledge and skills. Therefore, professional experience is rated highly as a fundamental pre-condition for successful CVET.

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[1] ISSTAL is the abbreviation for Interdisciplinary, Sequential-Specificity, Time Allocation and Lifespan.

In short, we can summarise that the findings of the quantitative studies have suggested that participation in continuing vocational education and training is more influenced by individual agency in Portugal, Spain and Greece, whereas structural factors (in terms of forms of provision of CVET and access to particular types of learning while working) are more influential in Germany, Italy and the UK.

In this third report of the PARTICIPA Project the results of the case studies and of the 'focus group meetings' will be presented. The function of the case studies was to find explanations for the significance of the identified factors, which affect the participation in CVETL, and also to scrutinise and to deepen the results of the quantitative studies. Therefore, the partners of the PARTICIPA Project have carried out one or two sectoral case studies per country by semi-structured expert interviews and non-participant observation.

Furthermore, the 'focus group meetings' in each region with experts of the investigated sectors should also contribute to deepening the results of the previous research phase in order to understand more fully the participation of technical workers in CVETL activities. The case studies should illustrate what factors contribute to continuous learning on the organisational and the individual level and how CVETL is put in place in economically successful and dynamic environments of smaller and medium enterprises (SMEs).

They also provide informative insights 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 competencies can be better acquired through other forms of learning.

To get a set of comparable data in this research phase the partners have agreed on some common criteria for choosing the case study enterprises. These are:

– The size of smaller and medium enterprises should be between 10 and 250 employees.
– The company should be seen as representing 'good practice' in CVETL.
– The enterprise should have a significant proportion of full-time technical workers.

The following case study and focus group meeting reports on participation in CVET in this third report are being presented by each of the project partners. Some variety can still be found regarding their structure to provide room for the differences between the company contexts in the different regions.

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Germany

Philipp Grollmann & Roland Tutschner

Learning while working in the IT sector and the aeronautics sector: two case studies from the Bremen region

Introduction

The European Fifth Framework PARTICIPA project involves an investigation into the factors influencing the participation of technical workers in continuing vocational education, training and learning (CVETL) activities in six countries. The initial findings have suggested that participation in continuing vocational education and training (CVT) is more influenced by individual agency in Portugal, Spain and Greece, whereas structural factors (in terms of forms of provision of CVET and learning) are more influential in Germany, Italy and the UK. This paper focuses upon case studies in the aeronautics sector and the IT sector in companies in the Bremen region. The data was collected by semi-structured interviews and non-participant observation and the case studies were intended to deepen results from the previous phases in order to understand more fully the participation of technical workers in CVETL activities. The case from the IT sector will be presented first, then the aeronautics case will follow. Each of the case studies will be finished with a summary on the main findings for the respective sector. Finally some cross-sectoral conclusions will be drawn.

Learning in a small IT Company - "Apprenticeship pays off"

An important result of our online survey about participation in CVET in the IT sector in the Bremen region is that the engagement of skilled IT workers in CVET is determined particularly by situational and demographic factors. Situational factors are, for example, problems and demands on the job. They are often the cause for participation in CVET. To the demographic factors belong, for example, company size and age. Both correlate significantly with the engagement of skilled workers in CVET. This is to say that the proportion of skilled technical workers taking part in measures of CVET is increasing with company size. In this case study we will deepen, review and specify these and other results of the previous qualitative and quantitative investigations.

Development of the case study and introduction to the case

The case study is reflecting on the results of the online survey of skilled IT workers in the Bremen region and many interviews with experts from the IT sector and of the focus group meeting. Like the former research steps it follows the major dimensions of the theoretic concept of social participation by D. H. Smith, the so-called ISSTAL model. It is the common theoretical framework for all partners in the PARTICIPA project[1].

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[1] A detailed account of this model can be found in the First Report of the PARTICIPA project: Brown, A., & PARTICIPA Project Consortium. (2004). Participation in Continuing Vocational

Criteria for selecting the case study

As agreed among the partners of the PARTICIPA project, the choice of the case study company was made according to the following three criteria:

– The size of enterprise should be between 10 and 250 employees.
– The company could be seen as representing 'good practice' in apprenticeship and CVET.
– The company should have a significant proportion of full-time technical workers.

Dimensions and aspects covered within the case study

The objective of this case study is to understand the phenomenon of participation in CVET in the IT sector in a better way. In addition it will reflect the different aspects of apprenticeship and CVET and motives for the engagement in apprenticeship and CVET in the selected company. Finally, the attitudes of the skilled IT workers to CVET, their motives for participating in it, their learning experiences, their reservations about CVET seminars, the acquisition of vocational knowledge and the means and strategies employed for the solution of work problems are also in the focus of our interest.

Data collection

The qualitative survey had been conducted between 5th and 12th of May 2004. The case study data was obtained by semi-structured interviews, by participant observation and by analysis of written company documents as well as the study of the company's web homepage. To get as comprehensive a picture as possible about the selected company, the interviews were conducted with actors in different functions and positions. Therefore we have carried out four expert interviews. Our interview partners were in detail:

– the manager and owner of the company (M.2);
– the training supervisor (S.);
– two skilled IT-technicians (E. and P.);

General contextual background

The IT boom up to the year 2000 was characterised by a lot of company foundations and a dynamic growth of turnover in the sector with annual expansion rates of about 10 per cent. The strong demand for qualified IT technicians resulted in a manifest lack of highly qualified manpower. This lack the government tried to compensate for by organising CVET seminars and retraining measures for university graduates. A strong growing CVET market and the implementation of the "green card" for IT specialists to close the

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Education and Training (VET): a need for a sustainable employability. A state of the art report for six European countries. (Vol. 38). Bremen: Universität Bremen. Detailed reporting on the quantitative surveys can be found in: Brown, A., Grollmann, P., Tutschner, R., & PARTICIPA Project Consortium. (2004). Participation in Continuing Vocational Education and Training: Results from the Regional and Sectoral Surveys (Vol. 51). Bremen: Universität Bremen.

[2] In the further text we will use these abbreviations.

gap of skilled personnel were other aspects of this development. But already in the year 2001 the IT boom slowed down noticeably and the whole sector came under economic pressure. The annual growth of turnover nationwide fell off to two per cent and in the year 2002 it was 2.6 per cent. Further effects of the IT crisis were declining numbers of employees and company bankruptcies because many of the start-ups experienced financial difficulties.

After a phase of consolidation and shakeout of the IT sector in 2003 with a turnover growth of only 0.3 per cent the branch association Bitkom forecasts for 2004 moderate improvement of the economic situation and increasing number of employees (Source: Bitkom, 6.9.2004). In comparison with economic centres like Munich, Hamburg, Berlin or Cologne, where the development of the IT sector till 2000 was particularly dynamic, the upturn in the Bremen region was less dramatic. On the other hand, the number of employees in the Bremen IT sector grew against the national trend even in the years of crisis 2001 and 2002 slightly from 1208 to 1269 as reported by the Chamber of Industry and Commerce in its annual inventory. But these numbers conceal that the increasing rate of jobs in the Bremen IT sector had reduced in 2001 for 30 per cent and in 2002 for 20 per cent against the respective previous year. (Source: Weser-Kurier 15.4.2003)

One reason for this relatively steady development of the Bremen IT sector seems to be the moderate branch boom up to the year 2000 in Bremen. It was characterised by a moderate and "postponing" growth of the IT sector. (Source: Chamber of Industry and Commerce, 2003, Weser-Kurier 19.2.2003). Even though the 'new economy' crisis in the Bremen region did not occur as dramatically as in other regions, the effects for enterprises and employees were similar. Also in Bremen since 2001 the consolidation of the IT sector goes along with bankruptcies, stronger thinking in terms of costs and efficiency, restructuring and reorientation of many enterprises. Catchwords in this context are concentration on core competences, reorganisation and introducing leaner company structures, increased cost management and reduction of CVET budgets (q.v.Weser-Kurier, 15.4.2003).

The company portrait

The company[3] of our IT sector case study was founded in 1908 as a supplier of office equipment and is located in the "Technologiepark" near the University of Bremen. It is a family-owned enterprise and has about 150 employees (including apprentices). One of our interview partners has characterised the company as a 'traditional enterprise in a modern branch'. It differs from many IT companies founded in the 1980s or 1990s in that the employees often have a final certificate from the dual system[4] and have, on average, stayed

[3] The company of our case study is marked with the abbreviation A.

[4] E remarks on this point: "The company, to the extent that I got acquainted with it, is quite untypical for an enterprise in the IT sector since many of those who have undergone vocational training […] got involved in this IT thing [i. e. at some later point]. Their origins lay rather in some craft trades. Many of them who are younger than I have already celebrated a 10 or 20-year employment anniversary. This is rather unusual in our industry. […] In the companies I know,

in the company for a longer time and are older than their colleagues from other enterprises. With the move into fourth generation technology in 1996 the management of A has decided to concentrate their company activities in Information Technology. A is now engaged in five business fields: IT-systems, software development, e-commerce, services and training. The activity of the CVET academy is driven by two purposes: to get new customers and to keep this small department profitable. In conjunction with other IT companies A belongs to a purchasing network, the so called 'Kompassgruppe'. This network offers CVET measures with the objective to improve the service standard of the member companies.

Since the IT sector crisis, the company is concentrating on the core activities and core competencies as a computer retailer (system vendor) and therefore it has sold some parts of the company. But also the services A. offers its customers has changed in the last few years. That is, there are fewer standardised products, but more and more services, products and product packages[5] which are adapted to the customer wishes are being sold. These services often are aligned with intensive consultation in which the customers wishes and the company's offers have to be aligned, calculated and bargained against each other.

A has a lean organisational structure that is characteristic for many SMEs. This structure enables the management and also the employees to react immediately and flexibly to the changes of the market. The four levels in the company are: business management, technical management, department management and the skilled technical workers. In its business area in the Bremen region A belongs to the biggest companies and is one of the market leaders. Due to an unfavourable economic environment participation of employees in CEVT today in A. is more influenced by imperatives of cost-cutting and efficiency than in the years of the IT boom.

Also the company expects from the employees the ability to organise their training participation autonomously or to find out the seminars necessary for their job tasks and to adapt by one's own initiative to the technical innovations in their working area. In A acting on one's own initiative is considered as one of the key competencies which is expected from the employees.

Initial education and training

The company is strongly engaged in VET. At the time of the case study it had about 20 apprentices[6]. A has a very good image and a good reputation in VET in the Bremen region. Therefore this year there were more than 600 applicants for only five new

employees stay for a maximum of 3 years. And the average age here is relatively high as well." (E.11) (Quotations have been translated by W. Wittig).

5 Often so-called combined dealings are carried out. In these dealings hardware, software and services are offered and sold combined.

6 That is 13 per cent of the employees are trainees. That is more than the average (8%) in German companies.

apprenticeship places. To get an apprenticeship place it is important to have the Abitur, a good school report and be able to fit into the group of the apprentices. Most of the apprentices can stay in the company after their apprenticeship, that is, they are given the option of regular employment in the company. In their VET the trainees have to do real work from the first day. For all apprentices, the company has a training agenda. In the 3 ½ years training they have to work in all IT departments of the company. Every half year the trainees join a new department and project team. The company trains in three of the four new IT vocations (IT system electronics technician, IT information specialist, IT system trader[7]) and is able to fulfil the required training regulations.

A good training concept from the company's point of view has three characteristics: first the new trainees should fit in with the other apprentices, second employees must be responsible for the trainees and third an exact plan should show the trainees their route through the different departments of the company. It should be emphasized that, apart from the transmission of technical skills, the company aims particularly at enhancing communicative competencies, the ability to work in a team and self-initiative. The responsibilities for their own web homepage and for a project in which the apprentices supervise the IT infrastructure of a school, should also enhance these competencies. The motivations for the company's engagement in apprenticeship, according to the company's management and the vocational training officers, are to ensure:

– an adequate supply of skilled technical workers;
– that after apprenticeship the skilled technicians can be employed very flexibly in various departments of the company;
– that from the first day the apprentices have to solve real tasks and they are productive from the third year. In the third year they are able to work like a skilled technician;
– skilled IT technicians who have had their training in the company are cheaper than those recruited from the external labour market;
– that after completion of the traineeship, IT teams in the company can select their new colleagues from among the former apprentices.

The competencies the apprentices have to gain in the apprenticeship are from the training supervisor's point of view:

– A broad technological knowledge as the professional basis;
– Team orientation;
– Communication skills and the ability to present the products and services;
– Customer orientation;
– Holistic and network-oriented thinking;
– Social skills are more important than technical skills (for instance the ability to learn in the team);
– Willingness to continue learning, especially through self-learning,
– Very important and desired is "self-initiative", i.e. self-contained engagement in their learning strategies and approaches to learning;

[7] Not being trained is the IT system trader.

– To adapt the companies values and the companies in culture.

In their vocational training apprentices should learn not only the technical basics but also the company's values, and social and communicative competencies.

Validation and feedback on results acquired in prior research

The company does not have a written or an explicit CEVT conception. To get the company's support for CVET measures the employees have to present their wishes to the team leader or to the technical leader (department manager). So participation in formal CVET is normally a result of a negotiation process between employees and the department managers. Provided that the CVET measure is reasonably priced or necessary from their point of view the company normally covers the costs. The participation in formal CVET of our interview partners is on average about five to ten days per year. This number is nearly identical with the average peak indicators of our quantitative study. But not every employee has the same chance to participate in a CVET measure. Employees who perform high-order services, for example technical consulting, may, according to the information of the general manager, take part on CVET measures on ten to twenty days per year. To make the competencies or deficits of the employees more transparent, the company tries to establish a new database:

> *"In the database information is stored as to how many and what measures of continuing education, including those not related to occupation-specific subjects, are attended by employees. It is designated to contribute to a more exact profiling of employees in order to allow for more appropriate recommendations concerning further training measures" (M. 3).*

Skilled workers learning and CVET in the case study company

In the centre of the following analysis are the interviews with two skilled IT workers from the department of pre-sales and technical consulting.

E. is a retrained skilled IT technician. He is a so called *"Seiteneinsteiger"(lateral hire).* Since 1988 E. has worked in this sector and for six years he has been employed in company A. After completing his *Abitur* and training to be a laboratory technician he attended a 1½ year course called *"Technikinformatiker"*. E. currently works in the second IT enterprise. Before that he worked in a small company which went bankrupt. Since 1998 he is working in the fields of pre sales support, project management, installations, consulting and specific trainings for customers – in short, technical consulting. E. labels himself an untypical skilled IT worker because he distinguishes sharply between working time and spare time (E.9).

Their statements will play an important role for checking and deepening of our quantitative results about participation in CVET, dealing with problems and learning in the workplace. Because their vocational biographies differ significantly from each other, we will introduce them separately. Our online survey had been conducted between 1st of August and 30th of October 2003. The survey, based on an online questionnaire, was completed by 134 skilled IT technicians in the Bremen region. The detailed results are specified in the second report of the PARTICIPA project. In the following we try to scrutinise and specify the quantitative results about participation in CVET in relation to the case study interviews.

P. has been employed by A for his whole working life, 15 years. After his apprenticeship as a "*Büroinformationselektroniker"* he was engaged in different fields of activity from copy technology up to client-server-architecture, CAD engineering, server-based-computing, mailing-systems up to pre-sales-consulting and technical consulting. He has viewed the radical changes and reorientations of the company from an office equipment retailer to a computer retailer. P. characterises himself as a "*Berufsfetischist"* ("occupation fetishist"). He is a skilled IT worker with body and soul and is strongly identified with the company. In his private office he simulates scenarios of customers and particularly he learns in his spare time (P.7).

Participation in and promotion of CVET

In the case study company there are two ways to participate in CVET:

> *"First, in cases when I am requested to do so [i. e. to attend a course]. And second, when I attend a training measure out of personal interest, that is, out of being an interested customer. Partly by self-initiative, when I said that I would like to do something in this field. Partly via the company. In case of the [qualification as] project manager it was the company who had said they would like me to that stuff. […] In some cases […] the company simply pushed me into matters that I would not have considered. Concerning other issues I was faster than them. In my opinion self-initiative belongs to this job, this is an essential point and this also concerns continuing education. Self-initiative means that one is taking care of one's own professional advancement" (P.2).*

To realise their CVET interests the employees have to take the initiative and have to present their favoured seminar topics to the department manager or team manager. The department manager has to be convinced of the seminar subject. The managers' decisions for or against the desired CVET measures often a "matter of instinct". Both skilled IT workers favour "advanced technical training". In these seminars job-specific problems are treated in a target-oriented and practical manner. These seminars are important to them because what is learned on the job often does not suffice to solve the occupational tasks. Sometimes it seems to be difficult to get the superiors' approval for these rarely offered courses. Less frequently, the employees' participation in formal CVET is a result of department manager's initiatives and their strategic imperatives. Recently the department manager recommended for both skilled IT technician who carry out more significant services *("höherwertige Dienstleistungen")* a seminar in project management to improve the success of sales initiatives[8]. That is, the department manager's proposals for CVET measures were oriented to general strategic objectives of the company, for example on the standards of competitors. Like most of their colleagues both IT technicians prefer the Internet for looking for CVET measures.

Motives and barriers for participation in CVET

In the online study the motives for participation in CVET most frequently mentioned were 'job requirements' and 'widening of professional knowledge' with more than 70 per

[8] For the seminar "service management" this would be in detail: to provide better quality and transparency to the customers and to launch with project management a tool with time-, costs- and resources management like bigger companies already have.

cent, as well as 'career prospects' with more than 60 per cent[9]. In addition to these results for the interviewees of our case study two more motives gain importance: 'customer's demands' and the 'CVET instructions from superiors'. In the online study only for 1.4 per cent of the respondents 'instructions from superiors' was the motivation to take part in CVET seminars. It must be mentioned that the superiors' initiatives mostly are addressed to skilled IT technicians who carry out 'higher services'. That is are strategic and economic important services for the company.

For about two thirds of respondents of the online questionnaire 'career prospects' are a motive for participation in CVET. At the same time we can see a correlation between CVET to raise career prospects and a lower level of educational attainment. That is, especially skilled IT technicians with a lower level of educational attainment believe they improve their career chances by participation in CVET and by getting certificates. The highly qualified IT technicians of the case study did not believe that there is a close coherence or a causal relationship between CVET and certificates and professional advancement, because the lean management structures in many IT enterprises mean there are few possibilities for professional advancement. Our interview partners assume also that many of the skilled IT technicians with a lower school leaving certificate level tend to compensate for their 'educational shortcomings' with CVET certificates.

Participation in CVET and the costs of seminars

As the online study has shown the high costs of seminars play an important role in participation in CVET. That is, the decision of an IT technician to take part in CVET measures depends to a high degree on the company's willingness to take on the costs. But also for the company the costs of CVET seminars play an important role. To reduce these costs the company favours regional seminars. Exceptions are in fields of important activity:

> *"Wherever we have a lot to do and are in a strong position, there one might indeed be told that one can participate in a forum in Munich. These decisions are always made on a case-by-case basis" (P.3).*

In their CVET strategy the company's management is oriented towards the qualification of employees in key positions with high value added and on the functioning of strong and fruitful key operating departments. If there are no convincing economic and technical arguments for a CVET seminar there is no chance for company support.

Amount of formal CVET

Seminars like the one on 'project management' with a duration of six weeks are an exception even for employees with a 'high potential'. On average these strategically important employees take part in CVET seminars between five and ten days per year. Mostly they attend two days or three days seminars, for example product presentations or

[9] Only 1.5 percent of the respondents stated that participation in CVET was a result of a directive or recommendation of supervisors.

measures to get certificates. Only very important employees of A. can get 10 to 20 days CVET per year. Most of the employees are granted considerably less CVET days per year.

Enterprise size and participation in CVET

The online study results show a significant correlation between participation in CVET and company size. That is, the employee's participation in CVET is increasing with the size of the company, or: the bigger the company, the higher is the employee's participation in CVET. The expert interviews of our case study support this thesis. For our interview partners there are three reasons for the lower participation in CVET of employees from smaller companies: financial, personal and occupationally related. The comment of one interview partner to the financial aspect is:

> *"This is a purely financial matter. Continuing education costs a lot of money. Five days are between three and five thousand Euros, just the fees for the training centre. This cannot be handled by small firms. Continuing education is simply an expensive thing in Germany" (P.8).*

The estimation that CVET is too expensive is a view that P. and E. share with the majority of their colleagues participating in our online study. They believed that high seminar fees could be a crucial barrier against participation in CVET. For E. - before he got a job at A he has worked in a small IT enterprise - the lower complexity of products and services in smaller companies is the reason for the lower participation rate of their employees:

> *"A system vendor with about 30 to 40 employees does not engage in solutions like those provided by A; they would rather deal with hardware and installations, which does not necessarily require particular courses. This is why learning occurred predominantly via self-study there. What has changed, however, is that nowadays the Internet has become the most important source of information. […] There was only an attendance at courses responding specifically to certain problems" (E.2).*

A third reason for the lower participation rate of employees from smaller companies could be the difficulties of small companies to cover the absence of its skilled technicians in the production process. On the other hand a reason for the higher participation rate of employees from bigger companies could be a CVET culture we often can find in these companies. In big enterprises often 'participation is considered natural'. The assumption employees of smaller IT companies are more engaged in learning on-the-job could not be verified by the regression analysis.

Age and participation in CVET

As the online study has shown employees over 40 years old employees are the most engaged participants in CVET measures. All the respondents over 40 had participated in CVET measures in the last five years. The factor age therefore is an important factor of participation in CVET in Germany. One of our case study experts has illustrated this phenomenon with the specific learning background, the specific learning experiences and the particular learning culture in which the older IT technicians grew up:

> *"The younger have other core interests and a different learning style. Those who are above forty years old are accustomed from their school or university background to learn in courses and seminars. Whenever there was a new model one attended a course, that's the old way of thinking. Young people have a different habit of networking" (M.6).*

Another explanation for that phenomenon could be that the younger IT technician feel better prepared on the current and the future job demands.[10]

The importance of certificates and CVET seminars

From the point of view of E. and P. the certificates that are very popular in the IT sector, e.g. Microsoft certificates, are of little use in practice. For them they have questionable value and a short period of validity. They believe also that in applications for new jobs and in assessments of qualifications and competencies, IT certificates play nearly no role or even a negative one. A long record of certificates could be negative in the application process. The employers in the IT sector are interested in real work experiences and not in certificates.

> *"In my opinion it's best to have professional experience […] To me, classic certificates are certainly a hint, but nothing more. One can find many things on the Internet and memorize them. That is, they are no proof of what he [the candidate] is actually able to do. Microsoft certificates are a hint that he might be qualified in the respective area. But that does not mean that he actually is very good. Regarding Microsoft there are so many questions and answers on the Internet, and people memorize this. But they don't know what it is they learn" (P.8/9).*

Instead of that they value CVET seminars like 'service project management' which are combined with a challenging thesis and an examination in a written and verbal form and so called 'advanced technical training'. In seminars like 'service project management' they can learn professional work and acquire specific job relevant abilities and competencies.

> *"Project management is important because customers have to be shown that one is doing professional work […] Project management means that a project is being drafted properly, that there is a certain sequence of work steps, that the use of certain forms is prescribed and so on. And this has something to do with quality as well. It is rewarding both for the company and for me" (E.3ff.).*

> *"In some cases I could not explain why I did something this or that way. The professional work in project management, in terms of what it meant for time scheduling, communication training and teamwork, has been a great improvement for me and enabled me to estimate and evaluate risks better than before" (s.P.9).*

In the CVET seminar 'service project management', organised via the purchasing network and recommended by the department manager, E. and P. have learned to integrate systematic time planning, quality management, communication skills and teamwork in their working process. Both E. and P. favour 'advanced technical training' because in

[10] See Wolfgang Wittig: A Regression Model of CVET Participation in the IT sector. In: Brown, A., Grollmann, P., Tutschner, R., & PARTICIPA Project Consortium. (2004). Participation in Continuing Vocational Education and Training: Results from the Regional and Sectoral Surveys (Vol. 51). Bremen: Universität Bremen.

these seminars their job-related problems are treated in a "goal-oriented, problem-oriented and practical" way, i.e. possibilities for solving of their technical problems are shown. Even though A does not have a written strategy for CVET the company offers its strategically important employees well directed high-quality CVET measures to get new and important competencies which are necessary for upgrading the efficiency and quality of their work. The strategy of department managers in their CVET recommendations is oriented towards the trends in market development and the standards of their competitors.

Informal learning and learning on-the-job

E. and P. gauge the relation of formal to informal learning as one to three or one to four. Even though term and content of informal learning is not well-defined this estimation reveals the high importance of learning on-the-job or learning in teams and at home for the occupation of IT technician. The maximal learning effect E. and P. reach is in dealing with concrete occupational tasks. Cooperation and reciprocal interchange with colleagues and teamwork are also becoming more and more important.

> *"One engages in the exchange of information – let's say, what kind of problem did you have yesterday – in order to draw learning effects from this. There are less and less loners, and it is all the more important that things are working in the team, for one must be able to substitute and supplement each other. […] We learn things from each other's example, talk about professional matters, we deal with customers. These are things we learn unconsciously from watching each other. E. has a certain calmness in the interaction with customers, I have a business-like manner, and that's how one learns from each other" (P.5)*

The skilled IT workers learn more than the solution occupational tasks require. They are learning also to some extent on reserve. If E. has enough spare time he is interested in the problems of new products he is dealing with:

> *"This is helpful since many new products nowadays are being "tested up" in order to save time. Therefore a new product must not be used in a productive environment" (E.6).*

It is important for skilled IT workers to know the malfunctions and bugs of new software programs and their weak points. Often the user has to identify these bugs. To know these malfunctions is important for the decisions about the applications because they have to decide if or when new products are fit for adoption in a company's environment where they can function without problems. An engaged IT technician like P. therefore checks and studies new applications first by simulation in private computer networks at home.

Problem solving strategies

The online study has shown the differences in the problem solving strategies of the IT and the Aeronautic technicians. While the Aeronautics technician favours solving their job-related problems by 'reading of handbooks' (89 per cent) and 'producer's support' (78 per cent) the skilled IT workers prefer the Internet (83 per cent) and online assistance (76 per cent). The case study experts confirm these results. For the Internet also is the first and the most frequent used step for solving occupational tasks and for learning:

"If I had a concrete problem in the operative process, I would go to the Internet. The favourite site for all of us is 'Google' when no information can be found on the supplier's website. As I still have to deal with Novell in a traditional way, I rather turn to the Novell site in case of problems. In fact, this site is organised in an exemplary manner" (E.4).

The second option for problem solving is handbooks and the communication with colleagues:

"Manuals are valuable, too. However, they are not really appropriate for the ad hoc problems that we frequently encounter. I cannot order a book if I have to respond soon. In these cases the Internet plays the most important part. It is also true that the exchange of experiences among colleagues has some importance because it's going well in terms of work climate"(E.4).

If the problems cannot be solved by Internet, handbook or together with colleagues then the IT technician consults the producer. In this context it is important that the company has the status of a business partner. In this case they can get a privileged access to the producer's information. Similar to E. is P.'s problem solving strategy:

"Primarily Internet search, of course. And in case I don't get further within my available time, I phone colleagues. One can read lots of things, look them up. […] One only needs to know where the stuff is, just like on the book shelf. […] And whenever one does not get along in time, one talks to a colleague. […] But in the high-end field we cannot ask many people anymore"(P.5).

Knowledge and experiences of colleagues are important if very urgent solutions are searched and Internet investigation is not useful. In contrast to this Internet fora and news groups for our experts are of small value. They believe that the information in these fora is often wrong, the sources are not identifiable and therefore are not trustworthy and reliable. In this point the results of our online study have to be interpreted more carefully.

In the majority of cases P. primarily reads up on the problems he has to solve at the homepage of the companies on the Internet. Then he simulates these problems at home by trial and error. Because he is the owner of a complete private network he is able to simulate problems of his occupational practice and to learn the principles through trial and error. But at work at a customers trial and error is not apposite.

Relevant skills and knowledge

For the IT technician's professional success the appropriate, efficient and confident handling of knowledge is very important. In a work environment with permanent technical innovations and new product developments the efficient organisation and renewal of vocational knowledge is very important:

"It is very often knowledge about knowledge. If I know where to obtain information, I have almost won […] One need not have everything in one's head, one has to structure this bulk of available information, and you simply can't have all these things in your head every time. One has to look it up in the manual or to search on the web in order to obtain those pieces of information that are required at the moment"(E.8).

Knowledge management, e.g. the ability to accumulate new knowledge systematically and the ability to structure and to treasure new knowledge, belongs to the important

competencies of IT technicians. Especially they have to learn about the changes triggered by technical innovations and modifications or paradigm shifts. E. illustrates this point in detail:

> *"In 1998, no one had talked about terminal-server-solutions. Now there is a shift towards the model of "server-based computing". This necessitates a huge amount of generalised or comprehensive work, one needs to have more information about the environment, and one has to take the initiative, to orient oneself and perhaps to engage in further education. A need for formal training is only at hand with regard to complex issues like these, not in respect of applications, which I use only 10 per cent of the time, like everybody else. You pick what you need for your job and ignore the rest. But in case of complex matters this is more difficult. What I miss in my younger colleagues is methodology. This is never changing. It's the way to approach problems, and many people are lacking this. Many people do not reflect, but make an immediate phone call or go to the Internet. To structure by themselves, that's an operation they do not manage to do. […] If I have already a basic structure, I can conduct my search more straight forwardly. That's what I mean by methodology. […] The consequence is that they load themselves with information they do not need. And then they use "trial and error". Very frequently these are people who did not have to deal with structured systems before, e. g. Windows NT. In structured systems, the search for errors is quite simple"(E.8/9).*

An extra learning effort requires technical paradigm shifts like the changeover to "server based computing". In this case self initiative, reorientation and the search for appropriate CVET measures is necessary. Complex innovations like these require systematic and structured advancement in collecting knowledge and the ability to distinguish important and unimportant information. And this ability, our interview partner assumes, is the ability of IT technicians who have learned a structured systems approach.

Quality of CVET measures

As the regression analysis has shown the quality of CVET measures only has a limited impact on participation in CVET. Unlike the majority of IT technicians participating in the online study the interviewees of the case study are not satisfied with the quality and content of CVET measures. Especially they criticize the certification courses as too removed from reality. And the tutors from their point of view are not practitioners – they relay only learned knowledge. The interviewees criticize the tutors' lack of work experience. In these CVET measures the imparting of knowledge is an end in itself i.e. specialists of CVET and not experienced practitioners give courses. In contrast to this the focus of 'advanced technical training' are concrete problems and practical knowledge and practical experiences will taught. One thing should be kept in mind in this context: the assessment of the value of CVET measures depends on the expectations towards these courses. E. and P. are working in the "high end" sector of IT technologies and therefore they have high prospects and expectations of CVET. Certificated courses which authorise the use of software programs and examinations in which memorized knowledge is learned are worthless in E.'s and P.'s view. Therefore their estimation of CVET measures is explicitly more critical than the appraisal of most respondents of the online study.

The new system of IT CVET

In the case study enterprise the new system of IT CVET was not familiar. None of our experts had heard of it. After providing information about the new system of IT CVET, our experts remained critical and affirmed their scepticism of certificates:

> *"If someone applying for a job in our company came up with such a sheet of paper, I wouldn't think much of it. Instead, I would pay attention to his professional competence and to whether the person is capable of working with us and fits in. If he is a database specialist anyway, he wouldn't have difficulties to convince our staff as well that he is a database specialist"(M.9).*

E. agrees:

> *"This means that in the end there is a stamped sheet of paper […] I have deliberately used this phrase 'the stamped sheet of paper'. For the question is, do I still need this when I have ten to twelve years of work experience. […] As a rule most employers I know do not care that much for some sheet of paper that was issued as a certificate at some time in the past, but rather pay attention to what people have actually done. Normally they are more interested in qualified work testimonials or references" (E.11).*

It becomes apparent from the above that it is the evidence of professional competence, professional experience and letters of reference that count for the management staff and for the experienced technicians as well. They believe that everybody is able to demonstrate real professional competence in the interview for the job. Mere certificates furthermore lose value in a time of fast developments of products because they refer to previous efforts and competencies. Our interview partners criticise the too strong differentiation of the specialist's profiles in the new system of IT CVET. So the general manager considers that this differentiation does not correspond to the broad job profile of an IT technician in a SME.

> *"We can't use it at all […] Out of the 29 specialist profiles on the technician level, a regular technical worker in our company most likely needs 19 at once" (M.9).*

P. also believes that SMEs need handymen rather than specialists:

> *"But 29 specialists on the technician level are indeed a lot. They are professionally skilled with regard to a small area, then. It would be nice to have Jacks-of-all-trades […] but today you don't find these anymore" (P.9).*

The sentences about the IT-Weiterbildungssystem reveal the low significance of certificates in the company investigated. Instead of that are demanded letters of employment which reflect professional experience and professional competence because certificates refer to merits of the past. The quotations clearly express the company's needs with regard to CVET. The offers of CVET should be as practical and related to concrete professional problems as possible and at the same time they should not be too specialised.

Conclusions for this case

Even though A. is not a 'typical' IT company (above-average strong engagement in apprenticeship, traditional company, high proportion of employees with dual vocational education and long company membership of many employees) and the interviewees

belong to the group with 'high potential' the case study has supplied much valuable information for testing and specifying the findings of the preceding research parts. The case study to a large extent confirms the results about the motivations of IT technicians to participate in CVET. That is, the engagement of IT technicians is released by concrete professional problems and interests as well as customers' requirements and is primarily targeted at the accomplishment of professional tasks and problems as well as adjustment to technical innovations. In the third place professional advancement was mentioned. For the case study participants 'instructions and recommendations of supervisors' have a high significance. The reason for this phenomenon is that these highly qualified technicians for the general management are addressees for the realisation of some of the company's strategic objectives such as quality, efficiency and customer orientation.

In respect of the CVET motives it is evident that the IT technicians of the case study favour especially advanced technical training, i.e. seminars which deal with problem oriented and practical questions of their professional routine. Both IT technicians choose the CVET seminars normally by Internet. They present them to the superiors to get their support. Therefore the participation in CVET in this medium-sized company often is a result of the employees' self initiative and of negotiations with their superiors. Because the department managers are not IT specialists they must trust the information of the employees when making their decisions. Seminars that focus on new qualifications and competencies or to new market developments or are oriented on new standards of competitors and exceed the immediate employees' professional ken like e.g. the seminar on 'service project management' are normally initiated by superiors. That is, the initiative for CVET seminars which have a strategic relevance for the company normally come from the department managers or the company's management.

In the case study company we can also find that high seminar fees for IT CVET measures in Germany have a strong impact on participation in CVET. Due to the high seminar fees many IT technicians only take part in CVET measures if the company bears the expenses. But in the CVET strategy of A the fees of seminars play an ambivalent role. On the one hand, the company demands its employees take part in regional seminars for reasons of economy. On the other hand, the company is prepared to accept high fees for seminars for strategically important employees.

A significant coherence between age and participation in CVET the case study cannot confirm but it can at least provide arguments for the assumption that the IT technicians who are over forty years old are particularly active in participation in CVET. Due to their specific professional learning experiences and learning approaches they have a stronger affinity to formal learning arrangements than their younger colleagues. One reason for it could be their mostly traditional learning socialisation in the dual system.

The case study results sustain also the correlation between company size and participation in CVET and allow at the same time more comprehensive conclusions. In connection with company size additional factors like CVET budgets and 'cultures of formal learning' become visible. That is, in larger companies there is often a combination of factors that are supportive of CVET, e. g. the existence of established CVET departments which have

deliberate strategies and budgets for CVET as well as the ability to motivate employees to take part in CVET measures. On the contrary, smaller companies due to lower financial and personnel resources often do not have the ability to support the engagement of skilled workers in CVET systematically. It is remarkable in this context that the IT technicians in smaller companies do not compensate their CVET deficits by concentrated engagement in self-study.

As the online study had shown many IT technicians view CVET as an instrument to realise their occupational career aspirations. But the case study's interview partners don't share this optimism and don't perceive any direct relationship between CVET and career advancement. Above all the flat company hierarchies in SMEs confine career advancement chances. They believe certificates are at best apt to fulfil the need for professional appreciation of employees with lower school leaving certificates, for their relevance as a certificate of qualification is questionable.

As with the online study, the case study shows the important relevance of informal learning for IT technicians. It is evident that especially in the IT sector with its high speed of innovation and its short product cycles new knowledge and competencies cannot exclusively be acquired by participation in CVET measures. Therefore it is not surprising that the IT consultants estimate the relation between informal and formal learning to be four-to-one. Finally, the case study puts into perspective the online study's results about the quality of CVET seminars. Due to the fact that IT consultants place high demands on practice- and problem-orientation of seminars and on the course instructors' competencies they have critical and negative appraisals about its quality. These critical assessments about course instructors and seminars, especially about certificate courses, are in contrast with the very positive evaluation of CVET measures expressed by the respondents of the online study.

German case study in the aeronautics sector: "Learning for a dualised shop floor"

Development of the case study and introduction to the case

This case study presents the results of investigations within a company selected from the aeronautic sector within the Bremen region. In the PARTICIPA project ITB has carried out research on participation in CVET and learning in SMEs and the aeronautics sector was selected for two reasons: it is a sector which is of significant importance for the Bremen regional economy and it allows for comparisons with the English results. During the project, qualitative and quantitative methods have been applied including expert interviews, a standardised questionnaire and case studies to illustrate and deepen the research of the prior qualitative and quantitative investigations. In this case study the results of in-depth interviews with two members of a company, an aircraft sales and maintenance enterprise, are presented and synthesised. The case was chosen based on the following criteria:

– Aeronautics is a sector of particular significance to the Bremen economy;

– The company can be seen as representing a case of particular 'good practice' because of its market position and/or its learning policies;
– The company has a significant proportion of full-time technical workers.

When developing the case study the following characteristics played a significant role:

– The case study was developed around the factors influencing technical workers' participation in CVET and in learning.
– The considered participation factors follow the major dimensions of the ISSTAL model or can be related to that.11
– The case study serves the purpose to deepen and illustrate the findings from the prior periods of research. With regard to the ISSTAL model it was found within the investigations on the IT as well as the aeronautics sector in Bremen, that there is a number of variables, which would be categorised as 'situational' within the ISSTAL model that seem to have a major influence on CVET and learning participation. Those situational variables are being explored through this study.

The case study investigated the following aspects of the company's policies and practices: business fields; the more formalised aspects of training policies and practices; and the support for learning and learning and HRD policies and practices. Interviews were conducted with two employees at two different levels of the company: the general manager (key account manager) and a high-level technician fulfilling technical management functions within the company as well as shop floor functions (see below). The interviews followed a semi-structured questionnaire made up around the ISSTAL dimensions. An additional module of the questionnaire was related to ambiguous results of the prior phases of research. In addition the Internet profile of the company was analysed. The main focus was laid on formal and more informal activities with regard to participation in training and learning. However, around that, substantial information was gathered about specific traits of the company with regard to its market position and its internal structure as important explanatory variables. In the next section the general characteristics of the company are described.

Business fields, structure and employees of the company

The case study in the aeronautics sector was carried out in an SME 25 km away from Bremen, specialising in the maintenance, repair, sales and chartering of small airplanes and private jets (usually for business use with up to eight seats maximum). The company is located at a small sports airfield, which is rented from its private owner and makes use of three other airports: Hamburg (one service technician is based there), Paderborn and Cologne. This extension was established because of the restrictions of the runway of the local airfield for some of the planes in service. In addition the company runs a small hotel and restaurant at the airport. It is a limited company belonging to four partners and some 10% of the shares belong to the managing employees. Since 2003 the company also has a

[11] The ISSTAL model is the common ground of the PARTICIPA project. All the regional research designs relate their findings and methods to this 'psychometric' model of factors influencing participation in CVET processes.

workshop specializing in flight electronics (avionics) at Bremen airport, taken over from a competitor, which went bankrupt mainly because of delivery problems of a major airplane manufacturer. This workshop is employing 25 persons, technical staff taken over from the prior enterprise. According to one of the owners there is only one competitor to the company in Germany specialising in the same business field, i.e. airplanes of that size. The main vendor for our case is Cessna. The most substantial part of the revenue is generated through the sales department. However, as in the car sector, this presupposes the infrastructure for continuously servicing the clients in technical and maintenance issues. Also similar to car business the dependence of the SME to its major aircraft vendor is extremely high.

Altogether the company employs 86 persons, of which 6-7 are employed as apprentices. Apprenticeships only exist for the occupation *Fluggerätmechaniker*, although the company is about to introduce apprenticeship training in the field of warehousing. Former apprenticeship schemes in aircraft and flight electronics had to be cancelled because of the lack of an offer in VET school courses in that domain in the Bremen region. At the top of the company structure there are sales and business management and technical management. The technical management is run by a half time employed senior aircraft supervisor (*Prüfer*) who is at the same time with the other half of his working time in charge of the position of the 'nominated post holder' of the German Federal Aviation Department (*Luftfahrtbundesamt*, LBA). Beside a small number of administrative staff the company employs staff for the operation of the charter airplanes (four employed and four freelancing pilots). The rest of the employees belong to the technical staff. Broadly clustered the technical staff (aircraft mechanics) can be divided into two groups: quality supervision (30%) and shop-floor mechanics (70%). The retention with regard to employed staff is very high. In summary there are the following characteristics of the specific sector and enterprise relevant to questions of initial training and HRD matters: business fields and activities are strongly determined through the specific vendor and the regulations of the Federal Aviation department. The high skills necessary to work in this sector results in comparatively stable employment perspectives. Work on the shop floor is polarised into repair and maintenance and quality supervision, which itself is strongly determined through safety regulations of the aircraft business. The main strands of activities of the technical staff are: controlling, maintenance and repair and quality supervision and auditing.

Initial and continuing education and training

Initial VET in the company

Since initial education plays a significant role for entering work in this particular field it will be analysed and described in the following section. It is mainly the high safety regulations that strongly shape the initial vocational education. The apprentices are not involved in the work process before the second year of training. Therefore, they spend the first year of apprenticeship training within the learning lab, where they learn the

fundamentals of metal engineering (see Box 1). Apprenticeship in aircraft mechanics takes three and a half years.

Box 1: Typical apprentice training sequence

"In the first year they don't work at all, they spent the whole time within the training workshop and learn the fundamental skills and knowledge of metal technology. The apprenticeship is carried out under the supervision of our junior Meister craftsman. They learn aluminium bending and curving, sawing, drilling, filing, just everything that is fundamental to mechanical engineering and working with metal. After the first year they start in slow mode with things like cleaning bearings, opening lids, greasing, cleaning washers. At some point they begin to join controls, of course they are not allowed to sign things off. This, they are only allowed, when they are finished. Then they get a stamp with their staff number. Each single assignment has to be stamped when it is finished, in order to make it possible to track who changed the bolt even after ten years. Apprentices are taking over such tasks and assignments but then they have to be stamped by someone else."

After the first year the apprentices begin to take over first real work assignments and gradually grow into working in control and maintenance. Only from the time of completion of apprenticeship are they allowed to sign their work themselves. Each member of staff has a stamp which documents who worked on which assignment. About 80% of the mechanics have originally learned their trade, the remainder coming from neighbouring fields such as mechanical or electrical engineering. The apprenticeships in aircraft electronics within the company had to be cancelled because it was being carried out in co-operation with neighbouring companies both in economic trouble, so that they had to cancel their engagement and there are no complementary school-based offerings anymore within the local vocational schools. Besides the apprenticeship training provided, the company also hosts the final examinations of the regional apprenticeships in the aircraft mechanic sector. There is a tradition of co-operation especially with the other aircraft maintenance and repair companies we had selected for our survey, but this is in danger because of the pressing economic situation. Before there was exchange of apprentices and most of the regional examinations were carried out at the case study venue, because according to our informants examinations are easier to realise on small airplanes than on bigger jets. One particular feature of the sector is the low turnover of staff. The average period of employment is ten years. That means that our case site is training apprentices far beyond its own demand on the skilled labour market. This might be explained by two factors: one is the screening function of apprenticeships and the other is HRD pooling. According to one of the owners it is only two or three out of ten apprentices that become real candidates for further employment within the company. This can be due to various reasons such as educational aspirations of the apprentices or just because the company is not interested in their further employment. High educational and mobility aspirations are the basis for the company preference to employ graduates of the Realschule (after 10 years of schooling, without the entitlement for higher education) for their apprenticeships and then retaining them by gradually up-dating their knowledge.

Box 2: A career in aircraft mechanics

Mike, 53 years old, with only compulsory schooling, finished his apprenticeship as a car mechanic in 1971, worked as a car mechanic for half a year and then entered the company for the first time because they were

advertising for staff trained in metal trades. Then he worked for three years with the company. During this time he retrained to become an aircraft mechanic.
"It was easier to learn the trade during this time, basically through watching. At that time the company was only working with 2- to 4-seat-planes. It did not really matter if you were working with a beetle's motor or an opposed cylinder engine of an aircraft. After three years I was able to work on my own and wanted a change. I changed to a small sport flight school with stunt pilots and accompanied them throughout their tours across Europe. There I really learned to do independent and autonomous work, without having someone who could show me things. Afterwards, I went on the supervisors' course, that's like being able to give the M.O.T. for aircraft. Planes have to be checked regularly and the person who signs needs a supervisor licence. It's a theory course similar to a Meister qualification. I paid 75% of the course and the rest was paid for by the employment agency."
After this examination prospects in the air circus were not good anymore, so in 1978 he changed back to his former company. In between he also gained the pilot's licence.
The company manager summarises:
"He is one of our best men. Even though he has a family with four children, I can always call him, he is working weekends. The best: if there is a repair case in Düsseldorf, I just sit him in a plane he flies there does the repair, signs it, issues the release certificate and comes back. In other cases I would have to send two or three staff members. You can see this is a real high-technology occupation, you can achieve a lot, I don't understand why people want to study (in higher education) necessarily. You can make an interesting career with us."

CVET in the company

There is no formal system of HRD or guidance with regard to CVET introduced as typical for SMEs in this sector and in general. The main strands of relevant CVET for engineers are as follows:

– Regular vendor specific courses, when there is a new product line launched (new planes and new engines) and
– courses for the acquisition of supervisors' licenses (Type A and Type B) issued by the federal flight agency.

The vendor specific courses are mandatory, too, because they are required for the supervisor's certificate. For each new type the supervisor has to prove he or she has passed a course on the type and has half a year of maintenance and repair practice (apart from new models, where this is naturally not possible). Typical courses related to the introduction of new plane types take 14 days and cost 4000$ which when travel and opportunity costs are added makes 10.000 € per course and individual. When selling a specific type, usually the company gets one mechanic training for free, however sometimes clients negotiate with the company and then it is turned into pilot training on that type. Some of the engine courses are being provided for free by the vendor, but other costs have to be taken over by the company. Very few cases of CVET were documented with a more general focus, such as rhetoric or (technical) English, which in former times was more usual, but now is demanded as a necessary pre-requisite for employment in the sector. The technical courses are being carried out and offered by companies specializing in flight training. Sometimes logistical problems arise, because supervisors with the same competences (in the legal sense of the term) cannot visit courses at the same time, because

there are no substitutes available with the low number of staff. Because of licensing requirements and the fast technological change, mechanical engineering in the aeronautics maintenance sector can be regarded as learning intensive. Box 2 illustrates a career of an aircraft mechanic. The person described is a very committed person with a high degree of occupational engagement. With all his additional qualifications he perfectly fits the needs of his employer. His engagement seems to be based on a strong interest in his trade and earlier in his career on his wish to gain a pilot's licence.

Learning and HRD Culture

Reading the prior sections one can see that aircraft mechanics is a very learning demanding business. There are two reasons for that, regarding the content of learning, the technological change combined with the security regulations. With regard to motivational aspects it seems to be mainly commitment to the trade and to some extent promotion aspirations that drive people. Those however can only be fulfilled for a low percentage of the staff, since 70% of them are working at the operational level.

Box 3: Business and work processes and CVET

"Some of them never enrol for a course at all. It really depends on the tasks you need those mechanics for. Someone who is basically assisting does not need those courses. I won't learn there how to exchange a module that can be done by any apprentice. What you learn there is troubleshooting and diagnostics or fine tuning. The pilot says: 'There is that and that problem, what could be the reason for that?' Only about 25 to 50% of the staff are able to help him. The other 50% carry out the tasks, exchanges of parts etc. Not everyone needs to be skilled for everything and not everyone can be skilled for everything. […] when it comes to our mechanics, we send them based on two criteria: is he suited to do that course, who is the one who will make most extensive use of it? You can enrol into a list, but the main thing is: basically the skills and knowledge are our capital and for us it is important to have kind of a 24/7 access time to our capital and not a 8/5."

This fact plus the high costs for training lead to a polarised structure in participation in CVET. Information on CVET courses is mainly gathered through the supervisors and upper-level technicians themselves. In addition the possibility exists for mechanics to put their wishes into a list and wait for an enrolment on those courses, although not everyone gets their wish (see box 3).

Learning is described by our interviewee as self-steered activity especially for the diagnostics and troubleshooting part of the job profile. A fundamental principle in diagnostics is to start out with the least cost-intensive possible solution and if that does not prove to work the gradual increase to more sophisticated, and at the same time more costly, possibilities. It was reported that there are a lot of things that cannot be "learned in advance". An often used strategy is to go home in the evening and then, sitting at the computer, search the manuals for a possible solution in order to be prepared to advise colleagues the next morning and make sure wheat they have to have for. The supervisors are very powerful in the sense that they have to carry the ultimate responsibility for the results of their technical controls. They are in between the interests of the business management of the firm and the mechanics. It was reported that some of the supervisors

play 'power-games' with this function and that it is very difficult for the management to intervene because of their high degree of autonomy. This again often leads to polarised structures reinforcing the problem of possible de-motivation among the 'pure' technical staff.

Validation and feedback on results acquired within prior research within the PARTICIPA study

The links between the quantitative survey and the case study

The quantitative survey had been conducted between 1st December 2003 and 31st January 2004 in two other enterprises in the Bremen region. Unlike with the survey 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. In total, 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. It was our intention to approach at least twice as many respondents, but the biggest enterprise (about 100 technicians in the maintenance area) we had established contacts to, fell into an economic crisis (see above). Differences with the IT sector 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 qualifications 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. This was shown by the educational credentials of the parents' as well the respondents' generation and is being reaffirmed by the recruitment policy in the case study. All respondents had completed a vocational education programme within the German dual system and that holds too for the case investigated. The major occupation is the aircraft mechanic. The big need for English language was stressed in our case as well as through the questionnaire. Among the vocational qualifications obtained after completion of the initial vocational training there is a clear dominance of the certificates CAT A and CAT B1 (n=7) and *Luftfahrzeugprüfer Klasse 1* and *Luftfahrzeugprüfer Klasse 2* (n=6). This is about one third of the respondents of the quantitative study and is in line with the structure and organisation of work in the case study company. The same holds for the high retention in the company which in case of the quantitative study was more than twenty years on average (n=13).

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. 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 "stabilisation" or have reached the peak of their career. The problem of locating themselves within the four-point scale of hierarchy in the questionnaire might be explained through the strongly polarised hierarchy in our case that might be typical for the sector.

Where do respondents learn their skills?

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. However, measures of continuing vocational education and training (n=9) and learning on the job (n=9) are also highly rated 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). This shows – as in the case study - that there are many reasons why CVET and learning are integrated into work processes in aeronautics. 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. Two reasons brought up by the case study might be responsible for that: the low participation of some of the respondents might be explained by the strong division between those formally under constant pressure to update their skills and those who are not; the low use of channels of information usually connoted with self-steered learning activities might be due to the high formalisation of the sector in how it is structured.

Attitudes towards learning

All in all the rather positive but 'reactive' orientation within the sector as regards CVET identified in the quantitative survey can be explained through the high degree of formalization and the strong tie to changes induced by the major aircraft vendors. The data collected in the survey provided some further evidence on the reactive learning orientation. A clear distinction could be drawn between the aeronautics sector and the IT sector with regard to more informal types of learning as well as the strategies respondents apply for the solution of practical problems at work. It was 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 indicated learning activities outside formal training programmes and also to some extent a sense of individual responsibility for one's own educational development it can be said that they received distinctly lower ratings.

This, however, might also be caused by the fact that the "learning awareness" of the respondents is not as high as in the IT sector. At least the results of the case study hint towards a quite learning intensive work environment under the proviso of the "reactive" learning orientation. Many of the findings of the quantitative survey can better be interpreted now, especially those relating to learning through outside firm contacts and direct contact with vendors. Those strategies seem to be of specific importance to the minority who are working at higher levels, doing work that involves technical control and supervisory functions.

Conclusions for the case

The case study brought up further results with regard to the 'situational' variables of the ISSTAL model. The high relevance of those situational variables is illustrated through this case study. In fact, the case study shows how complex the relationship between the different personal and situational variables is. The following conclusions can be drawn from this case:

- The aeronautics maintenance sector is a very learning intensive and learning demanding field of work. This is not reflected through the educational credentials of the employees working in the sector, but rather through a constant process of learning in and parallel to work processes.
- This learning is a necessity to perform the job because of formal reasons (security regulations and fixed competences in the legal sense), but the formalisation is also influenced by technological change in the sector. Therefore, the aeronautics sector is an interesting case for the combination of work on the intermediate level while at the same time demanding lots of learning and knowledge acquisition from the individual worker.
- Due to the flat hierarchy within the SME a particular individual commitment to the trade and a high amount of engagement are the necessary pre-conditions to turn the learning intensive work into personal advancement within the company structures. However, retention in the company is also quite high and an important strategy of the management, since prior learning and experience of the whole staff is a key success factor for the company.

Because of the strong division of formal competences between the staff, the CVET culture in this company might be called *dualised, rather reactive and stable over time.*

Outlook and generalisability of the case

The overlap with the findings of the quantitative survey reinforces the idea that the case is giving a valid in-depth account of the factors contributing to the CVETL activities of individuals within the sector. The reactive and dualised CVET culture observed is not a huge problem for a 'sustainable' employability as long as there are such stable working conditions and retention possibilities as in our case. However, there are potential risks for employees working in this sector: the strong ties to aircraft vendors and the increased international competition in the aircraft maintenance sector, which affected two potential case study candidate companies severely in the Bremen region. In the long term such a polarized HRD structure and CVET learning culture might risk overlooking certain

innovation potentials with regard to competitive advantages of regional networks in the sector. The former co-operation with regard to apprenticeship between different companies is an example of such a strategy that at the same time suffered from global competition. Comparisons across Europe and comparison across fields within the aeronautics sector will result in a deeper picture of CVET cultures across different branches of skilled work.

Cross-sectoral conclusions

Both case studies show the significant importance of the initial training system for the shape lifelong learning processes take during the career in specific sectors. This becomes particularly aware when comparing the results of the German studies with those in the British or in the Italian setting. A further commonality is the attributed importance of learning in work processes in both of the sectors.

The "dualised" learning culture of the aeronautics company compares to a learning culture in the IT company which is more evenly spread among the staff members. Even though constant learning takes place in both examples at the shop-floor level and in both cases is strongly connected to immediate technology driven job-demands.

The individual motivations with regard to participation in CVETL vary. Professional advancement aspirations and client-orientation play a bigger role in the IT-company. With regard to advancement it can be said, however, that in both cases because of the lean and flat hierarchies of small companies the advancement prospects are not high. However, the structure of work in the IT company seems to be more open for dynamic and individualised solutions whereas the structure in the aeronautics enterprise is more stable as a matter of the strong formalisation of work. Although retention in the company is also quite high and an important strategy of the management, since prior learning and experience of the whole staff is a key success factor to the company.

At the same time the management of the IT-company more strongly acknowledges the strategic functions of learning and training and its relevance for the companies' future than the management of the aeronautics company. Here, again because of the high degree of external formalisation and dependency on the main vendor, constant learning is a stable part of the job of the shop supervisors.

With regard to the content of training and individual learning in the case of the two companies, highly specialised technical skills and knowledge play a significant role. Because of the more multiple purposes of learning in the IT-sector, learning content goes beyond the instrumental orientation in the aeronautics case, such as illustrated through the 'project management course' in the IT case. In both cases certificates brought in from the external training market play only a weak role. Documented work experience is far more appreciated in both cases. The critical stance on some of the courses offered by the IT sector could be symptomatic of the low degree of professionalisation of the IT sector as compared to the aeronautics sector which can build on stable structures within a long vocational tradition.

Our case studies have in most cases supported the ISSTAL model. However, the retained information through the case studies in combination with our survey data goes beyond the ISSTAL model in scientific and policy terms, since the results illustrate the specific importance of sectoral and regional factors, which influence the actual behaviour of individuals regarding CVETL. Individuals are closely embedded into complex relational networks which shape the forms and content of learning more than general personality traits. The understanding of this complex interplay of factors is crucial for any scientific modelling of learning practices as well as for policy interventions.

Greece

Nikitas Patiniotis & Olympia Kaminioti

Introduction

The PARTICIPA project focuses on the investigation of the factors that influence technical employees' participation in continuing vocational training. It examines the factors that facilitate VET participation as well as the factors that obstruct participation of technical employees. In previous reports we presented the analysis based on quantitative data about the factors that affect Greek employees' participation in VET. This report supplements the findings presented in the previous reports with the findings derived from the qualitative data analysis. For this phase of research, we collected data with in-depth interviews, focus groups and a case study of a 'successful' case of a company in promoting the participation of its employees in learning activities.

Quantitative and qualitative data are used in this project in order to shed light on different aspects of this project inquiry. Quantitative data allows for broader generalisations while qualitative data provides richer information on specific issues allowing for a deeper understanding of the question at hand. The combination of both types of data provides us with reliable and rich information about the factors influencing VET participation.

With both the quantitative and the qualitative phase of the project, we are examining whether personal characteristics, organisational characteristics or institutional factors are affecting the chances of participation in VET for employees and especially for technical employees. Moreover, the final aim of the project is to translate the findings into appropriate policy suggestions for the promotion of lifelong learning of employees. In this endeavour, it is very important to identify more and/or less successful personal and organisational cases and understand the reasons behind the outcome and in the case of the successful ones the extent of the transferability of the procedures followed.

With the personal interviews we collected detailed data - mostly from employees - about their life history and how different aspects of their life influenced their training participation. The interviews included some of the employees that filled in the survey questionnaire (of the quantitative phase of the project) and some from other companies.

At the focus groups we presented the results of the quantitative phase of the project and collected qualitative data from participants on the core question of the project. The first focus group included participants in the training process of technical employees with different roles: employees, employers, trainers and experts. The second focus group was performed with employees and supervisors from the same company, in which we also performed a case study of their training policies and practices.

The case study was performed in one business, which we consider a model case for training participation of technical employees. The case study examined the educational and training model of this company, compared it with practices about training in other companies and tried to understand the functioning of this training model in the specific

company and second whether elements of this educational and training model can be transferred to other situations.

In the next sections we present the data of the qualitative phase of the PARTICIPA project. First we present the data from the personal interviews, then from the focus groups and finally we present the case study of the "successful" company in promoting training participation for its employees. In the final section we discuss the results already presented and outline some policy suggestions based on these results.

Personal Interviews

The value of personal interviews as a method for collecting data has been proven in many sociological studies. These active or in-depth or semi-structured interviews take the form of "directed conversation" in which the researcher uses an interview guide and the informants have plenty of room to answer in their own way and to link their answers with the issues they consider relevant (Holstein and Gubrium, 1995). In-depth interviews allow the researcher to get detailed information on the question of a project and often to collect more detailed data than planned. Besides the actual words of the informant, other characteristics are evaluated during the in-depth interviews such as the ease or difficulty in answering a question, body posture and other non-verbal characteristics. Verbal and non-verbal information gets evaluated and becomes a unique source of information. On the other hand, the weakness of this approach relies mainly on the lack of generalisability due to the small sample size. In this project, the results from the interviews are used to deepen the understanding on certain questions and not to draw inferences solely from the interviews. Moreover, special attention should be placed on the selection of the key informants. The ones selected should have besides narrative ability, also characteristics interesting for the questions examined in the study. In this case, key informants with different personal and work characteristics were selected. In any case the value of this approach lies in the richness of data collected and not on the generalisation of the results. However, every effort should be made to contract interviews with informants whose characteristics vary as much as possible not in order to be able to generalise the results but in order to collect as much data as possible.

The three main hypotheses examined with the in-depth interviews are the following:

- Personal characteristics are significant factors affecting training participation of employees.
- Organisational characteristics are significant factors affecting training participation of employees.
- Situational factors are significant factors affecting training participation of employees.

According to the first hypothesis, the characteristics of the person are greatly affecting the likelihood of this person participating in training programmes. This hypothesis can be divided into two separate ones, one relating strictly to the characteristics of the person such as his/her education and the other relating to social background characteristics such as his/her parents' education. According to the second hypothesis, the characteristics of

the work environment such as business size are mainly affecting training participation of employees. According to the third hypothesis, situational factors such as being awarded a fellowship or given the opportunity to attend a seminar are significant factors that affect training participation of employees. Of course it is also possible that an interaction between any of the factors considered by these hypotheses could influence training participation and in this case the components of this interaction are to be identified and evaluated. For this phase of this project we conducted 11 interviews with members of the labour force. We also performed some interviews with business representatives, which are presented in the case study of the 'successful' business case. The selection of employees was done in such a way as to achieve a broad range of characteristics of the people and the organisations represented in these interviews.

In the interviews with employees we followed a life-story approach asking the interviewee to talk about his/her educational and labour market history. We collected information on the parental family and the new family of the informant. We also collected information about the work environments in which he/she had been working. In the following section we present the data from the in-depth interviews. The information collected from the personal interviews is structured under the following headings: demographic characteristics, education and training history, work history, attitudes towards education and training, factors influencing training participation and conclusions.

Interview 1: Eleni

Demographic characteristics

Eleni is 34 years old, married with two sons, 12 and 13 years old. She comes from a working class family without much money. Her parents were immigrants in Germany at some point. She also spent the first few years of her life in Germany. Her husband has secondary school education and worked as a technician in an information technology company. She has a younger brother who is an electrician. Her parents own a little fish store. She lives in the centre of Athens.

Education and training history

She has a university degree in social and political science. She speaks English and some German. She got into the university with difficulty (after her third trial). She has recently started attending training courses offered by her work. She also participates in a number of training courses that are not related to her work and are offered free-of-charge from her work.

Work history

She has been working in several types of jobs since 18. These jobs include working in a video store and other retail jobs. She has been a public employee for ten years now working in the public telephone company (OTE). She got into this job using a political connection. Her first position at OTE was giving information about telephone numbers, and then she moved to more technical posts such as budgeting and promotion of products. About half of her time she spends at work is used for her work duties and the

remaining time either she spends preparing for her kids' homework, playing on the Internet or doing other things.

Attitudes towards education and training

She says that she likes to learn and she wishes to participate more in educational and training programmes. Until recently she has not participated in training programmes related to her work. She recently changed posts at work and decided to attend a number of training programmes in order to advance her skills at work and get 'official papers' for these skills. The training programmes she is attending are free of charge. Her current boss agrees with her choice while her previous boss was not so encouraging. She uses training in order to advance in her career, partly because she has to and partly because she likes it. She also participates in training programmes not related to her work. She is encouraging her husband to attend training programmes offered free of charge from her work. She wishes to do a masters programme but believes it is very difficult for her to do it. She feels "getting a masters degree is a luxury she cannot afford". She feels her husband does not comprehend her wish to do a masters degree. Her parents do not understand her wishes either. "If I went for a graduate programme my parents would think I had lost it completely". She likes her kids going to a private school but she fights with her husband trying to justify such expense as a necessity. She spends a very large of her time working with her kids' homework trying to improve their performance at school.

Factors influencing training participation

She currently participates in training in order to learn and advance in her job. Her social background (parents) and her husband are limiting her involvement in education and training. Her husband does not believe it is so important for her to participate in certain programmes. Her personal interests are her motivating factors. Her work environment (her boss and her current tasks) is currently a motivating factor while previously it was a discouraging factor.

Conclusions

She is a young educated woman who says that she wants to participate more in education and training. "If I had time I would like to do a masters degree" she says but the next minute she says how she finds it impossible to pursue such a thing. Her work routine does not make it necessary for her to participate in training. At times when her work environment encourages her, she takes part in training both for her own satisfaction and for her work. Her dreams about further participation in education and training are censored by her social background (parental family and current family).

Interview 2: Manolis

Demographic characteristics

Manolis is 37 years old, married with two sons 12 and 13 years old. He comes from a middle class family. His father was a construction manager and his mother a housewife.

He has a younger sister who is employed as a health assistant in a private health centre. His wife has a university degree and has a public job. He lives in the centre of Athens. He is married to the previous informant (Eleni).

Education and training history

He was never a very good student. He graduated from a technical high school; students that find it difficult to attend the general high school make this choice. He was not interested in continuing his studies after that. While employed in an information technology company, part of his job was to attend seminars. The training he got included many aspects such as technological changes in the products of the company, sales techniques, management techniques etc. These seminars were an intrinsic part of his job. When he lost his job, he considered attending a subsidised seminar only to earn the subsidy. For a short time he attended a training course in a foreign language that was offered for free through his wife's job.

Work history

After graduating from high school, he did his military service, which is obligatory in Greece, and then he worked in a company fixing electrical appliances. He then found a job in an information technology company where he stayed for 15 years. He started by fixing electronics and gradually moved to more managerial positions. In the latter posts he was involved more with sales and ordering components from the mother-company, which was abroad. He also dealt with customers in Greece. In his last post he was the supervisor of five people. In the last year, his company gradually reduced its personnel. He was fired nine months before the interview and since then he has been unemployed. He has been receiving unemployment benefits since then and he is looking for another job. There may be an opening for him in a few months in a company where one of his friends works.

Attitudes towards education and training

While in high school his attitude towards education and training was negative. He likes technical things such as fixing a computer or a radio and learning how to do it but not reading how to do it. While he was working at the information technology company he had to follow the technological changes connected to the products of his company. Part of his job was to attend seminars. He did attend these seminars and considered them part of his job. When he became unemployed he did not consider attending a training programme offered by the Public Employment Services in order to improve his skills but only to supplement his family income. He prefers his kids going to a public school and not to the more demanding private school his wife chose. Spending money for private schools and private lessons for the kids is unnecessary for him. He has continuous disagreements about this with his wife who prefers to send their kids to a private school and other supplementary private lessons (English, etc). He is considering transferring his kids to a public school. He would like his kids to take music lessons. He also loves music. Because of his wife's job he can attend free of charge training programmes in languages and other aspects. For a while he attended English but then he quit. He chose to attend a

low level seminar, similar to the knowledge he already had, following his wife's suggestion to start from there in order to perfect his language skills but soon was bored and then was not interested in attending any other level.

Factors influencing training participation

When training is an obligatory part of his work he does not question his participation. Otherwise he has no motivation to participate in training. It seems that the motivating factor for training participation is his work environment. According to him, "if he were a public employee like his wife, he would have no reason to participate in training". His wife has also been a motivating factor but in most cases she has not been able to overcome his reluctance to participate in training. Even during the time he has been unemployed, he did not choose to attend any of the programmes offered to him for free even though he is complaining about the absolute boredom he faces now that he is unemployed and he has to stay at home for many hours.

Conclusions

His personal characteristics do not motivate him to participate in training. Training is seen as a necessary task of work and unnecessary in other cases. Situational factors and his wife's influence have in certain cases affected his training participation such as when free programmes were offered through the job of his wife. These factors have not proven as strong as his personal interests.

Interview 3: Yiannis

Demographic characteristics

Yiannis is 43 years old, married for two years and has no kids. He comes from a working class family. His father was a construction worker and his mother was a housewife. He has no siblings. He grew up in Athens. Three years ago he got married with Viki, (the next informant) who has two bachelors degrees and a master's degree and works in a private company. They would like to have kids. They live in the same apartment building, with his in-laws, which is located 30 kilometres from Athens.

Education and training history

He was a good student at high school and wanted to become a mathematician. He did not manage to do well in the entrance exams for the university and ended up entering a polytechnic (TEI) in a small city of Greece to study mechanical engineering. He attended some semesters and then quit. Since last year he decided to go back to school and get a bachelor's degree in business. He intends to continue with a master's degree. He is a 'straight A' student. During his working life he has attended a few seminars related to his work.

Work history

He has been working in the same company for about 12 years. This company is a wholesale company, selling paper supplies and electronics. When he started working there,

the company was very small (3 employees besides him) and since then it has been growing rapidly. Today the company is in the stock market and has about 50 employees. His posts in the company included working in the stock department, in sales and recently he became responsible of a new department which sales computers and other high tech items.

Attitudes towards education and training

He feels education is important and in several social environments he tries to hide the fact that he does not have a bachelor's degree. It is very important for him to get it now and continue with a master's degree. A lot of times he believes he knows more than his teachers but he still wants to get 'the paper' (the official degree). He feels bad his parents are not very educated. He believes work-related training is important for his job. He likes to read and expand on the training he receives at work.

Factors influencing training participation

Situational factors were responsible for not continuing with education early on. A failure at the entrance test for the university created psychological problems, which led him even to quit the TEI that he had entered. He felt this department was not good enough for him. He always wanted to continue with his education but he was postponing the decision and many times he did not want to think about it because it was depressing. His wife and friends encouraged him very much to continue with his education. The fear that he may face problems at work because he did not have a bachelor's degree and the possibility of better work prospects in other work environments influenced him towards pursuing a degree. His supervisors at work were somehow threatened by the fact he is continuing with his studies. For a while he did it secretly, later on he had to announce it to them. Their negative attitude gave him another reason why he had to continue with his studies.

Conclusions

Yiannis is a person that values education but his personal characteristics (and perhaps his family influence) limited him in the past in getting a higher degree. He managed to overcome these problems and continue with his education later on. His chances of advancement without a degree in a very competitive labour market and the support of his wife and friends influenced his decision into greater participation in the educational system.

Interview 4: Viki

Demographic characteristics

Viki is 35 years old, married without kids. She is married to Yiannis, the previous informant. She has a younger sister. Her parents are university educated and well off financially. Her broader maternal family is a family of well-educated people. In her parental family, a number of people have migrated to the USA. She has been married for two years and would like to have kids. She lives in the same apartment building with her parents, which is located 30 kilometres away from Athens.

Education and training history

She was always a good student. After high school she got a bachelor's degree in law, satisfying more her parents' wishes and less her own interests. Then she got a bachelor's degree and master's in archaeology, which was her own wish. She attended several training programmes, some because her work as a high school teacher in a private school offered and others because she chose to do it for personal and work development. The training she chose to do on her own included attending seminars in other countries. Now she is attending a programme in the history of art in a private college in order to improve her knowledge in the subject taking advantage of the funding she gets through her job to attend such a programme.

Work history

She worked in a number of jobs some related to her studies and others not related to them. Before she found her current job, she was a part-time teacher of English and French. Now she teaches history at a private elementary and high school and likes her job very much. She has made a contribution in a book published a few years ago. Occasionally she writes articles in newspapers and magazines.

Attitudes towards education and training

She has a very positive attitude towards education and training. She finds it very important for both personal and professional development. She attends the seminars offered from her work happily. These seminars include pedagogical topics and topics related to her speciality. She believes any information she gets is useful. She believes strongly in the idea of lifelong learning. She wants to be a student continuously. The fact that her husband did not finish his bachelor's degree bothered her to some extent and tried to persuade him to continue with it. Her family also felt that the educational background of her husband was not satisfactory in comparison to hers.

Factors influencing training participation

She believes it is necessary to train continuously in order to learn more and perform better at her job. She believes education and training help her to be balanced and creative. She thinks attending training programmes has many benefits for her. Her family also values education to a great extent. Therefore, both her personal characteristics and her social background characteristics have affected her training participation history in a positive way. Her work environment has facilitated her wishes towards training and perhaps has made them stronger. She claims that she would not like to be a professor in a public high school because she is afraid she would not have the same opportunities for attending seminars and that the public school would not offer her such a challenging environment as the private one. Situational factors such as the funding she receives from her work to attend seminars is another positive factor in her training participation history.

Conclusions

She has a very positive attitude towards education and training. She can be characterised as a great fan of training. Her work environment influences her positive attitude towards training. She says that she chooses to be with people and in environments that have positive attitudes towards training.

Interview 5: Alexandra

Demographic characteristics

Alexandra is 46 years old, married with one son 2 years old. She got married three years ago to a person who did not get his bachelor's degree because he "owes two courses". She lives next to her parents who take care of her son when she and her husband are at work. Her parental family is a middle class family, the father has a small company and the mother is a housewife. She is actively involved in the socialist party. She lives in the centre of Athens.

Education and training history

Alexandra has a two-year degree in accounting from a private school, which she finished after graduating from high school. Since she finished her degree she has not attended any training courses. In her job, several courses relevant to her work were available but she did not have any interest in attending them. Even when she was pushed by her supervisor to do so she tried to avoid it. She was afraid that if she had attended the seminars she would be loaded with more work and she chose not to attend them.

Work history

She worked at her father's store for a while after graduating and then found some temporary jobs in the public sector through her social network. Five years ago she found her current job at a semi-public organisation. Her job is to work with data, to prepare tables and simple graphs. She has been in the same post since she got hired in this organisation. She complains that some of her colleagues got higher increases in their salary than her but she prefers to be paid less and be less stressed than others.

Attitudes towards training

She says she is very critical of training. She is reluctant to attend seminars that for example would perfect the computer skills required for her everyday tasks. She feels it is better to do things slowly "her own way" and that attending the seminars would result in increasing her load of work. In the semi-public institute that she works, she manages to do very little and even though her salary does not improve as much as the salary of some of her colleagues, she prefers to have extra time at work to help her father with his own company. She is considering attending the Open University in Greece to get a university degree. If she decides to do it she would choose the degree that is easier to finish. She feels this degree will help her advance in her work.

Factors influencing training participation

Personal characteristics affect her negative attitude towards training. She sees education as a way to advance in her career but she is not really interested in advancing her skills or knowledge. Her work environment does not push her enough to change these attitudes.

Conclusions

Alexandra is a person who has found the security of her job very satisfactory and she believes that education may help her advance to a higher position but she is not really interested in the content of the studies.

Interview 6: Yiota

Demographic characteristics

Yiota is 43 years old, married with two sons, 5 and 12 years old. She has been married for 15 years to a well-educated person who works as a business consultant. Her family is well educated and well off financially. Her husband's family comes from a village, is poor and not well educated. Her husband is the youngest of four siblings. He is the only one of his siblings who received higher education. Yiota is the oldest of three siblings. All of them have university education and one of them has a master's degree. She lives in the northern suburbs of Athens.

Education and training history

Yiota got a bachelors and a master's degree from a British University. She also started there her Ph.D. but did not finish it because she got married and started a family in Greece. She never felt she quit her degree but that she did other things for a while and that she would go back to it when possible. She attended training programmes both when unemployed and employed to learn more about her subject.

Work history

In the beginning she struggled to find a job relevant to her interests and education. For a while she was teaching English and Italian to kids. She also held minor jobs many of which were temporary and low paid. Eventually she found a job that was satisfying in terms of content but not very satisfying in terms of salary. She has advanced in her career but expects to do even better when she finishes her doctorate.

Attitudes towards training

She loves to read and learn. She is very open to learning things relevant to her work or not relevant to her work. She reads literature, history, political books, philosophy and other subjects. She is critical of certain training programmes but has a very positive attitude towards learning in general. She appreciated attending several training programmes in the past while she was disappointed by some of them. She is willing to attend more training programmes in the future. She is also very anxious to finish her doctorate. She is complaining that her husband does not understand her "need" to finish

her degree and considers it as a luxury item that causes problems in the operation of the family. On the other hand, she appreciates the positive reinforcement she receives on this aspect from her parents. Her supervisor at work is also supportive of her continuation with her degree. He also supported her attending a training programme that she suggested to him. She pays a lot of attention in the education her children are receiving. She would like to choose the best schools for them. She is currently sending them to private schools.

Factors influencing training participation

Her general attitude towards learning is very positive and influences positively her participation in education and training. Her family choices have delayed her educational plans and her husband's attitude is negative towards her continuation of her studies. Her parental family is positively influencing her participation in education. Her parents are partially financing her studies. Her work environment is facilitating her participation in education and training.

Conclusions

Acquiring knowledge is of high value to her. She is in general very positive towards education and training. She draws strength in her effort to finish her Ph.D. from her parents, her boss and mostly her own wishes in order to overcome the difficulties she is facing in finishing a degree from a long-distance, overcoming the lack of time and the negative attitude of her husband.

Interview 7: Michalis

Demographic characteristics

Michalis is 55 years old, married with two daughters 15 and 17 years old. He has a younger sister who is a public employee. His wife is a public employee. He comes from a middle class family. His father was working in a public bank and his mother is a housewife. He lives in the northern suburbs of Athens. He likes sports very much.

Education and training history

He studied business administration in a Greek university and then he got a master's degree in accounting in France. He has not participated in formal training programmes. He says he has participated in "day-to-day work training programmes" during his work career. He means that he got trained through working and he learned from the everyday performance of his duties and from watching his supervisors in earlier stages of his career.

Work history

After getting his master's degree, he came to Greece and served his (obligatory) military service. Then he worked in the accounting department of a private company for 13 years and then in a semi-public organisation. He has been working in the same organisation for 15 years and expects to retire from this organisation. In this last organisation he was

originally an accountant and then he became the director of the economics and human resource department.

Attitudes towards education and training

He thinks very highly of education but does not value training seminars very much. He wants his kids to go to university. He believes they will get in but if they don't he doesn't want them to attend a polytechnic (TEI). There are certain skills usually required by the position he is holding such as PC literacy that he does not have. He prefers to use "pen and paper" and he feels it is too late for him to learn how to use the computer. His assistants use computers on a regular basis. He also says he does not have the time to attend training programmes because he is overwhelmed with work. He claims he has learned to do his job this way and it is very difficult to become productive in any other way. He adds that his general director does not push him to learn computers because he is happy with his work. About human resource management, an area where he also does not have any formal training, he believes that it is not something you learn in classes but through work experience.

Factors influencing training participation

His personal characteristics seem to be the most decisive factors affecting or rather discouraging him from participating in training. He is negative towards training but positive towards education. He values education very highly for himself, his colleagues and his own children. His work environment is not pushing him into becoming more involved in training.

Conclusions

He has a successful career, which is satisfactory for him, and he is not seeking to improve it anymore. He is conveniently happy with his achievements and expects to retire without facing the necessity to train formally for any subject that relates to his work.

Interview 8: Anna

Demographic characteristics

Anna is 46 years old, married with two sons, one 24 years old and the other 20 years old. She comes from a middle class traditional family. She has an older brother who is an engineer. Her husband works in a private company. Her older son is an engineer. She lives in the same apartment building with her parents. The two families are very connected; in a lot of everyday functions it is like they live in the same house (the grandmother cooks for everybody, the daughter does most of the shopping, they eat together whenever possible, etc). She lives in the southern suburbs of Athens.

Education and training history

She was a good student. When she was finishing high school she wanted to become a doctor. Today she is not sure whether it was really her wish or a wish to satisfy her

parents' expectations of her. She failed the test to enter medical school and decided not to go to the university and study another subject or to try again. When she was 41 years old, she decided to go back to school and get a bachelor's degree in psychology. After this she attended a four-year private programme to become a therapist. She is now in her second year. She also attends seminars related to her studies. She is considering doing a master's degree when she finishes her current programme.

Work history

After failing to enter university, she found a job in DEI, the public electrical company. She worked there until she decided to quit her job and get a psychology degree.

Attitudes towards education and training

She values education. She is very proud her son finished a good engineering department and is now going abroad to take a master's degree. Occasionally she felt guilty she left a secure job to get a degree but she is happy she dared to do it. She says she owed it to herself. She has not participated in training programmes while employed but she is attending a number of seminars besides her main programme. She believes training is essential to be up to date with your knowledge.

Factors influencing training participation

Her personal characteristics influenced her decision to quit a secure job in the public sector and continue with her education. Her parents disagreed with her decision or were not able to comprehend it. Her husband was supportive but at certain times she says she is not sure he understands what it means for her to finish with her degree. She wanted her husband to understand how important it was for her. She felt that about her husband especially at the graduation when he was not as supportive and involved as she wanted. "At the graduation he was there but he left early; he did not stay for the party afterwards; after all I am not sure he understands what exactly it means for me and how difficult it was to do it and to do it right". Her kids were very supportive and proud of her actions. Therefore, her personal characteristics are the main driving force for getting more education and training not related to her job since she chose to change career paths but related to her prospective job.

Conclusion

Anna is an intelligent woman who followed prepared paths in her wok life for a while, prepared by her parents that would satisfy the expectations of a middle class family. She had a secure job in the public sector with an average salary that many Greeks would wish very much to have, she made a family early on, she has the support of her parental family in her everyday life and financially she does not need to worry since her parents have given her some assets and her husband is earning a good salary. However, she felt uncomfortable in the role of public employee and decided to purse a different career at an older age that is unusual by Greek standards. Her financial situation made it possible or easier for her but her main motivating factor was her own wishes about herself.

Interview 9: Martha

Demographic characteristics

Martha is 26 years old, not married and without kids. Her mother owns a store that makes and sells desserts. Her father owns a small store that sells belts. Her parents are divorced. She has an older brother who works with her mother. She has a long-term relationship but does not consider to get married yet. Until last year she lived in an apartment with her brother and now she lives in her own apartment in the northern suburbs.

Education and training

Since she was young she wanted to become a kindergarten teacher. She was an average student at school. When she was in the last years of high school she decided to go to the university to become a kindergarten teacher. She failed the test three times. She entered instead the polytechnic on the same subject. The polytechnic department trains specialists who deal with kids from 0-6 years old while the university department trains kindergarten teachers who are involved with kids 4-6 years old. In the beginning she had rejected the polytechnic because it has a lower status in Greece compared to the university but then was very satisfied with the subject and the education/training she received there. She now fells this department fits her better than the university department. She attended a number of training programmes during her studies and while she was working. After graduating she went to England to get a master's degree. She is attending training programmes whenever she finds something interesting.

Work history

She worked as a kindergarten teacher in private and public schools. Recently she got a job in an organisation that prepares programmes and advises kindergarten schools on issues relating to their programmes. She also works in a public kindergarten school. Always she had more than one full-time job.

Attitudes towards education and training

She has a very positive attitude towards education and training. She tries not to miss an opportunity for following a programme related to her work. At the same time she is critical of certain training programmes. She believes she cannot do her job well if she is not trained continuously.

Factors influencing training participation

Her general attitude towards training is very positive. Her parents were very supportive of her continuing her studies after high school in whatever subject interested her. After she graduated and started working, she decided to continue her studies abroad. At that time she had a possibility of getting hired at a public kindergarten school, which she risked losing by going abroad. She decided to risk it. Her father was not very supportive of this specific decision. Her father said at the time: "I don't understand why you are continuing to study and you risk losing a good and safe job." Her mother was more supportive of her

going abroad, offered to cover all expenses but Martha got a fellowship from the Greek State and financed her studies mostly from that. Some of her old professors were also very supportive of her decision to get a master's and of her attending training programmes some of which were offered by the polytechnic. The schools at which she had been working were very different in terms of support for her continuation of studies and in general the attitudes towards training. In a private school where she worked, there was no interest in training or retraining. More emphasis was placed on functional issues and the business rather than the educational aspects of the school. In another private school where she worked, the attitude was totally different; there it was considered almost obligatory to participate in training. In the public school where she worked, she got mixed signals from different people. Older kindergarten teachers were not always supportive of ideas of training and felt antagonistic with newer staff that tried to be more actively participating in training. When the new staff took more of the load of the work, they became less antagonistic. On the other hand, at the higher level, which is at the level of the ministry and other organisations that influence the operation of public schools, there was support for participation in training.

Conclusions

Her general attitude towards training is very positive. For her "as long as she can she would continue studying". She feels that this attitude is not specific to her occupation but it is true for almost every occupation.

Interview 10: Konstantinos

Demographic characteristics

Konstantinos is 35 years old, not married and without kids. He comes from a traditional family. His father owns a small store that sells newspapers, cigarettes and other small items. His mother used to help in the store and now takes care of his sister's children. He has another brother who works with his father in the store and a sister who works in a private company. He lives in an apartment in the same building with his parents. His sister is married and also lives in an apartment in the same building. So does his other brother. He is very close to the other members of his family. He lives in the southern suburbs of Athens.

Education and training history

He was an average student. He did not enter the state university and his parents financed his education first in a private college in Greece and then in the UK. He has a bachelor's degree in business and a master's degree in communication. He has attended some training programmes in his company.

Work history

He worked in a number of companies including in an advertising company. Now he works in a training company. He is responsible for preparing proposals for funding and preparing training programmes and has recently become a director in this company.

Attitudes towards education and training

He seems to value education but is bitter because his degree from a private college in Greece does not get recognised by the Greek state. He is sceptical about training programmes even though his job is to write proposals in which he emphasises the importance of training. He attends programmes when it is absolutely necessary. He believes in most cases he can learn better on his own instead of in an organised programme. During the time he was working in the advertising company he attended a seminar on computers that was suggested by his boss. In the beginning he was reluctant but he was persuaded it was necessary and at the end he felt his boss was right. There were other possibilities to attend training programmes but he was more negative since he started having problems with some of his supervisors at the company and since then he refused to participate because he felt he would soon leave the job.

Factors influencing training participation

His work environment both as a general structure and more specifically in terms of the attitudes of his immediate boss had influenced his training participation. A positive environment and a motivating boss have managed to overcome his scepticism about training and resulted in his participation. In other cases he avoids it. In the later cases, his personal attitudes overcome the other factors.

Conclusions

Konstantinos is rather negative towards training but a positive work environment can overcome his negative attitudes. In certain cases the work environment really overcame his attitudes while in other cases he was forced to participate.

Interview 11: Maria

Demographic characteristics

Maria is 52 years old, not married and without kids. Maria comes from a well-educated family. Both her parents have university level education. She has an older sister who is a medical doctor and is married to a medical doctor. Her family is very rich. She lives in the same apartment building with her parents. She lives in the southern suburbs of Athens.

Education and training history

Maria was a very good student at school. Her older sister studied medicine in Greece. Maria tried to enter the medical school in Athens but failed in the exam and she started medical school in a very good university in Italy following the tradition of other family members. Four years later after a tragic event with a patient that she witnessed as a student, she quit medical studies and started studying economics in the same department for two years. She quit these studies because of personal issues and decided to come back to Greece and start working. She has attended training seminars since then. She is thinking of going back to school and finishing her degree and then getting a master's degree. Besides Greek, she speaks English, German, French and Italian.

Work history

Her first job in Greece was as a travel agent. In the beginning she worked at a friend's company and then she opened her own company. In the beginning it was doing well but at the end she went bankrupt. Then she worked in a multinational company starting as a secretary and then ended up becoming a project manager with many responsibilities. She took over several significant projects in this last company.

Attitudes towards education and training

She has a very positive attitude towards education and training. At the same time she is critical of a lot of training programmes and for that reason she wants to choose carefully where she spends her time. She does not commit easily to a programme unless she considers it valuable. She often learns on her own by collecting the necessary material and studying it. Her family feels very bad that she did not finish her bachelor's degree and it is always in her mind to finish it but she is not sure if she will actually do so or not. She also feels very badly about the fact she did not finish it because the lack of the bachelor's had limited her in many ways in her work life and she has to make tremendous efforts to prove she can do more than what a high school graduate can.

Factors influencing training participation

Her family influenced her career choices early on and the comparison with her sister has always affected her as well. Her effort to differentiate herself and find her own way influenced her choices to follow certain programmes or to quit them. In her value system, education and training occupy a high place. She wants to get a bachelor's degree not only to satisfy the others but also for herself. Her first boss in her current job was negative when she wanted to participate in a training programme addressed to people occupying higher positions than her at the time. She was then employed as a secretary but had started being involved in other tasks. Her subsequent boss realised her abilities were beyond those required for a secretarial job and facilitated her advancement in higher posts and her participation in many training programmes.

Conclusions

Maria is a very capable person that has a lot to offer in a company. Her educational credentials are not very good but her skills are considerably higher than her qualifications. Indeed she has skills that are usually common among people with very high educational credentials. She is someone who values education and training but for personal issues has not finished certain levels of education. Her training participation record has been influenced by her personal characteristics and work environment characteristics.

Conclusions from the interviews with employees

We conducted eleven in-depth personal interviews with employees, although two people are not currently employed, one is unemployed and one is on a training programme. However, both these people have been employed in previous times. The interviews followed a biographic approach that covers mostly their work life; with information drawn from all stages of their work life, so the fact that two of them are not currently

employed was not a problem. From the interviews we can draw the following conclusions. The overall attitude of people towards education is much more positive than their attitude towards training. In some cases it is not easy to draw a distinction between the two but in other cases it is possible, and education is valued higher than training. The difficulty in distinguishing between education and training is depicted not only in the answers of our informants but is a common characteristic in the discussion of education and training issues in Greece by lay people and often by experts. The higher importance of education versus training is also a common characteristic of the Greek population and can be explained by the role education has played for social advancement in recent years and by the short tradition of formal training courses in the country (Patiniotis and Stavroulakis, 1997).

It is clear from the interviews that personal characteristics play a very important role in the decisions people make about whether they should seek to participate in a training programme or whether they would do it willingly when it is 'offered' by their job or by other situational factors (such as free courses offered through someone's spouse). These personal attitudes are to some extent affected by parental family attitudes and by the spouse's attitudes. In most cases, parental attitudes towards education and training have a positive effect and a distinction can also be made between these cases in which they have a strong effect and others where they do not have such a strong effect. Interesting on this point is the case of Maria who is 52 years old and her parents and sister are influencing her towards stronger participation (mostly in education). Maria is single and this fact may have to do with her family having these opinions. On the other hand, there are cases of married women that are involved in education or training (Anna) whose parents do not comprehend their persistence in getting better education and training instead of dealing more with their family and their job. In these cases the need for higher education or more appropriate education is not understood and more importantly it is not appreciated that Anna, or any other person that would be in her situation, would be better equipped to find and perform a job after completing the programme she is attending.

The effect of current family is also quite interesting. Even though the sample size of our interviews does not allow for generalisations, we can make some remarks. According to our data, educated women seem to be more supportive of less educated men to participate in education and training and push them to get as high credentials as possible. Viki is a good example of someone who exhibits this type of behaviour. Men, on the other hand, whether they are highly educated or not, do not seem to be so supportive of their wives continuing with their education or training.

This "complaint" is mentioned by Anna who doubts her husband's support to some extent about her educational achievements, by Viki who would like to participate in education more but feels her wishes are censored by her husband, and by Yiota whose husband considers her involvement in education as a type of hobby or luxury item.

Tab. 1 Personal Interviews With Employees – Summary Of Results

Informant	Extent of participation in education and work-related training	General attitude towards education and training	Personal factors	Family factors (parental family)	Family factors (current family)	Organisational factors	Situational factors
Eleni	Education: great Training: some	Education: positive Training: positive	+	-	-	- (past) + (now)	+
Manolis	Education: some Training: some	Education: neutral Training: negative	-	no info	+	+ (past)	no effect (now)
Yiannis	Education: some Training: some	Education: positive Training: positive	- (past) + (now)	+	+	-	no info
Viki	Education: great Training: great	Education: positive Training: positive	+	+	+	+	+
Alexandra	Education: some Training: no	Education: neutral Training: negative	-	no info	no effect	no effect	no effect
Yiota	Education: great Training: great	Education: positive Training: positive	+	+	-	+	no info
Michalis	Education: great Training: no	Education: positive Training: negative	-	no info	no info	-	no effect
Anna	Education: great Training: some	Education: positive Training: positive	+	_	+ (?)	no info	+
Martha	Education: great Training: great	Education: positive Training: positive	+	Mostly +	single	Great variability	+
Konstantinos	Education: great Training: some	Education: positive Training: negative	_	+	single	Variability	no information
Maria	Education: some Training: some	Education: positive Training: positive	- (edu) + (train)	+	single	(past) + (now)	no effect

The extent of organisational factors influencing employees' decisions to participate or not to participate in training varies greatly. Certain work environments make training part of the everyday tasks of the employees and in this case there is no choice to avoid training (Manolis in his previous job), while in other cases training is offered on an optional basis. In the latter cases, those employees that have positive attitudes towards training will take advantage of the opportunity (Eleni) and others would pass up the opportunity (Alexandra). There are also cases where supervisors have been restricting the participation of their subordinates, either because they do not believe in the necessity of it or because

they feel threatened (Maria). Situational factors or opportunities people have to attend training programmes have a positive effect in the cases where people are positively oriented towards training. To sum up the results: we could say that personal factors seem to have a strong effect and family factors also have an effect, which is stronger than what the data shows since family factors have already influenced personal attitudes. Work environments influence training participation in a variety of ways that are connected with the characteristics of the organisation itself and in some cases the characteristics of supervisors. At the end the net result is always an interaction effect between these variables. In the following table we summarise the results from the personal interviews with employees.

Focus Groups

The results of the quantitative phase of the PARTICIPA project as well as the data from the personal interviews were presented to selected participants in two focus groups. The presentation of these results and the questions examined in the project were the subject of discussion in these two group interviews. Focus-groups are a specific type of group interview in which information is collected not only from the statements of participants but also from the interactions of participants who are encouraged to present their opinions and comment on the opinions of others. Moreover, it is the interaction between the participants and between the participants and the organisers of the focus group which allows for the deeper understanding of the subject of the focus group and which distinguishes focus groups from other types of group interviews (Morgan, 1988, Barbour and Kitzinger, 1998).

Focus groups take advantage of the dynamic, which is often created within a group when a subject is discussed. The opinions expressed by the participants and the interactions among them make it a useful method for examining the social world especially when we are interested in understanding the multiple realities of people's experiences (Krueger and Casey, 2000). While focus groups are not considered appropriate for certain types of topics of social research, such as abuse (Morgan and Krueger, 1993), for educational research they are considered very appropriate (Williams and Katz, 2001). They have been very useful especially for outcome evaluation and needs assessment (Krueger and Casey, 2000). In the following section we present the data collected from the two focus groups.

First focus group

The subject of both focus groups was the examination of factors that facilitate or obstruct employees' participation in VET activities. The selection of the participants of the focus group is a critical decision that affects to a great extent the quality of data collected. It has been argued that in certain cases it is better to include people that know each other and who do not have hierarchical relationships among each other. At any case the selection of informants depends on the aims of the data collection process. In this project for the first focus group we chose people who are concerned with work-related training issues from different roles: two employees, one employer, two trainers and three VET experts. These informants did not know each other prior to the focus group and for this reason before

the actual discussion we arranged for an informal meeting of participants and organisers followed by the presentation of the PARTICIPA results and then the actual discussion.

During the discussion a number of important points were raised referring to the specific characteristics of training institutions, businesses and society at large that affect training participation. Personality issues and other individual characteristics were not raised in particular during this discussion. The importance of 'learning culture or philosophy' in facilitating VET participation by individual employees and companies was underlined. In the lack of such a philosophy several participants attributed the lack of learning practices by individuals and organisations. Moreover it was stated that this 'learning attitude' exists only in a small segment of businesses and the population. At the same time in Greece education is highly valued but the value is mostly connected to the outcome and the consequences connected with the outcome and not to the educational or learning processes. In other words, education is highly valued because it is associated with higher economic and social prospects but the process of continuous learning is undervalued. The suggestions offered about changing the existing situation have to do with the transformation of the educational system at all levels and changes in training and other labour market policy measures.

Some participants connected this point to the difficulty in separating education from training and initial from continuing training and the implications of this difficulty for policy design. The short history of training programmes in Greece and the higher value traditionally placed on education instead of training makes these distinctions unclear in the Greek case. However, it was clear that education because of its longer history is more often properly or officially accredited while this is not always the case with training. The importance of accreditation of training programmes and the accreditation of skills was raised as a factor that facilitates training participation of technical employees. Examples were given from the information technology case.

Another point that was raised was the importance of informal work-related learning and in general the process of tacit skills development during the personal/family life and also during the working life of people. The development of these skills and the development of experience during working life are not accredited in a way that can be used as other skills and competencies. For example, the skills developed by a housekeeper are not officially recognised in the job market even though they are often similar to the skills required for certain occupations. Job experience is, of course, valued highly in certain circumstances and especially at early or medium levels of someone's career. In some cases, especially when someone is changing occupations or employers at higher stages in his/her career, experience is not valued as much as it should be. The low horizontal educational mobility and the low occupational mobility in the Greek labour market partly explain this finding.

Second focus group

While in the first focus group participants were selected to represent different roles in the VET process and came from different work environments, in the second one we invited

participants from the same company. Their common characteristic is that they work for a company that is considered very successful in promoting the participation of its employees in VET practices. They actually work in the company for which we constructed the case study for the PARTICIPA project. This second focus group consisted of employees of the same company including two senior supervisors, one from human resources and the other from training, one employee who is a trainer and three other employees. The discussion took place in their company and started with the presentation of the outcomes of the project.

It was very clear by the statements of all participants that training is highly valued in the company and that it is considered part of everyday work. For supervisors it was considered a "necessary investment" that pays off more than the money you invested. Employees consider training necessary in order to perform well and advance in their career. Some employees believe they are lucky to work in an environment where training is valued highly and characterise training as a bonus offered by their job whereas some other employees consider it a necessary duty they cannot avoid. The role of training for adapting employees' technical skills to new technological developments was raised as an obvious reason for placing such high value on training. Other "side-effects" of training were also given special importance. These side effects include the communication of the company's philosophy or culture, "socialising employees into the family of the business", creating stronger ties among employees and between supervisors and employees and offering a pleasant experience to all. In other words, training improves job outcomes both by improving the technical skills of employees but also by creating a better working environment.

It was also mentioned that in this company everybody participates in training including higher managerial staff. The initiative for the training in most cases lies both with supervisors and employees. In some cases employees suggest training requirements, which are usually granted. Training planning and evaluation is carefully designed. Even though it is recognised that measurable outcomes of training programmes are difficult to isolate, there is an effort to estimate them. In the environment of this company in which training is highly evaluated most employees do not openly refuse training participation. A few exceptions to this are attributed to mismatches between the attitudes of the person and the company.

Case Study

The merits of case-study research, especially when the interest of the researcher is on an 'extreme case' have been documented by several authors (for example Yin, 1994). For the PARTICIPA project we were interested in examining the case of a 'successful' company in the development of VET participation procedures for its employees. The company selected for this purpose is a cement producer company in Greece. In the sector of non-metallic minerals in Greece about 17,400 people work in 500 companies[1]. The sector

[1] Taseis (2001), The Greek economy, (in Greek), p. 296.

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 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.

- 1922: Insurance of employees for work-related accidents
- 1927: Reducing hours for employees
- 1934: Christmas bonus equal to one month's salary for all employees
- (It was institutionalised for all employees in 1957)
- 1938: Easter bonus equal to one month's salary for all employees.
- (It was institutionalised for all employees in 1957)
- 1960: Special filters used to reduce pollution, first time used in Greece
- 1960: Doctors in all locations
- 1960: Social workers in all locations
- 1969: Marriage bonus to all employees who got married equal to one month's salary.
- 1971: Systematic environmental projects
- 1976: Common employers-employees committees for the prevention of accidents
- (they became institutionalised in the Greek labour market in 1986)
- 1979: Common employers-employees committees for reducing work-related illnesses
- (they became institutionalised in the Greek labour market in 1984)
- 1980: Lifelong learning programmes for all personnel
- 1985: New projects for reducing industrial sound pollution
- 1988: Extra vacation bonus for all employees (in addition to the one required by law)
- 1994: Vocational guidance programme for employees' children and children of the neighbouring communities
- 2000: Participation in the establishment of the Greek social responsibility network
- 2000: Special programmes for reducing accidents in schools
- 2002: Participation in United Nations projects for the promotion of human rights,
- work rights and reduction of child labour
- 2003: Participation in international initiatives for the promotion of sustainable
- development and the improvement of the quality of life.

The cement sub-sector has been developing due to the infrastructure created for the Olympic games of 2004, the major infrastructure work which is still taking place in Greece, and exports. It may face some restructuring problems in the near future since cement is used less in construction and new materials or new types of cement take its place. The company we are examining is the largest company in the sector and one of the most profitable companies in Greece (with regard to total profits).

For the construction of the case study we collected data from conversations with employees, from interviews with directors of the company and from examination of written reports prepared by the company. The company we examined is a leading company in Greece with respect to several issues. Financially it is one of the most profitable companies that have been developing steadily and continuously. With respect

to social issues – including VET participation practices – it is also a leader in the Greek market. It is one of the first Greek companies that pay considerable attention to social responsibility practices. Recently besides publishing its economic data every year, it publishes a 'social responsibility budget'. The major landmarks in this endeavour can be seen in the list.

The above list includes only the most important policies adopted by the company. With respect to educational and training procedures, the policy of the company can be briefly underlined in the statement of one manager: "training is the best tool for the development of our people". Education is highly valued during the selection of their employees and is considered as a minimum requirement for certain positions. At the same time it is argued that education does not equip the labour force with the necessary skills for effectively performing their tasks in the labour market. Because of this mismatch between labour market needs and educational outcomes, on the job training is necessary.

In certain ways this mismatch allows companies to "build employees according to the needs of the specific company". During training sessions, the company promotes not only the development of technical skills and competencies but also the development of a closer relationship among employees and between employees and supervisors. The company is using training as an opportunity to "educate its people on the values of the company, on the overall philosophy of the company". Therefore, training takes the role of a socialisation process of the employee into the society of the company.

It is worth noting that company supervisors claim that education should adjust to labour market needs. Among other roles of education, this seems to be of the higher importance for them. Because it does not adjust, its importance is considered lower than the importance of in-company training. Because education does not prepare employees according to their needs, companies need to "re-educate workers and invest in their continuing training".

According to the attitudes of employees and managers in this company, VET is absolutely necessary and the company is obligated to train its employees in order to perform according to the higher standards and in order to guarantee its future development. It is, of course, recognised that most Greek companies do not share these opinions. The differences of these companies with the one examined here are not limited to the issue of training but expand to many issues. The reasons behind the differences between this and other Greek companies, and the success of this company in several aspects, are attributed by managers to thoughtful managerial decisions in the past and present. At the same time it is underlined that the social environment in which companies are operating in Greece does not encourage these thoughtful decisions. For example the lack of an overall learning culture makes the decision to create such a learning culture within a business a hard task. This characteristic creates difficulties not only in the establishing of successful practices but also in transferring the existing ones to other environments.

Discussion of Results

The main question of this project was to identify the factors that facilitate and obstruct the participation of technical employees in educational and training activities. The broader aim was that the outcomes of the project will be used to draw policy proposals for the promotion of learning practices in businesses. The analysis pointed to a number of personal and organisational characteristics that are related to the extent of work-related training participation. Concerning personal characteristics we found – mostly from the quantitative phase of the project - that women, young people and employees with higher education participate more in training. We also found that part-time workers, non-permanent workers, employees in the public sector, employees in large businesses and those that use technology the most, are participating at higher rates than others. With respect to business characteristics we noticed the following patterns:

– In very small companies, formal work-related learning is rare for both supervisors and employees. Leaning is based on formal education prior to employment and informal on the job learning. At the societal level there are some opportunities for formal VET participation but business owners are unwilling to participate or let their employees participate. Operational problems, the lack of a 'learning culture' and problems with the way the training programmes are organised are some of the reasons for the low participation rates in these environments.
– In very competitive companies, formal work-related leaning is part of the job. Learning is based on formal education prior to employment as well as on formal and informal on the job learning. The offer of formal VET opportunities is high and participation is required. Personal characteristics are not strongly related to the probability of participation but they do matter in the process of hiring and advancing in the job.
– In the public sector, learning is based on formal education prior to hiring. Formal work-related training is extensive compared to the private sector but it is not well linked to work needs. The offer of formal VET opportunities is high; participation is often not required. Personal characteristics operate as facilitating or obstructing factors in VET participation.

Two of the questions raised at the beginning of this project remain without a clear answer. Which factors (personal characteristics, organisational characteristics, societal factors, etc.) facilitate/obstruct work-related formal learning? And which policies could promote formal learning in businesses? The analysis showed that certain personal characteristics are associated with higher participation. It also showed that in different organisational settings practices about VET participation of employees differ significantly. It is not easy, however, to claim that for the low participation of an employee in a small company the blame lies solely on the organisational characteristics of the company. The employee of this company is, of course, limited by the organisational characteristics of his/her company but at the same time s/he is – at least to some extent – choosing this working environment based on his/her personal and family characteristics. In the same way, a well-educated ambitious employee of a competitive business benefits from the VET opportunities offered at his/her company not only because of the characteristics of

the company but also because of his/her personal characteristics (attitudes and behaviour).

In the question of policy suggestions we need to reconsider the factors that facilitate or obstruct VET participation from a slightly different angle. The high relationship between certain personal and organisational characteristics and VET participation means that for certain groups it is easier to promote VET participation. Of course, taking into account the reasons behind these relationships is critical for achieving even higher rates. The promotion of VET participation for the social groups or environments that presently exhibit low participation rates is more challenging. One approach is to design tailor-made programmes and policies according to the specific needs of each situation. This way some of the problems mentioned by small business owners could perhaps be overcome. However, the point made in both focus groups about the lack of a 'learning culture' or a 'learning philosophy' we believe is of critical importance. In large competitive businesses such a 'learning culture' has been created by the efforts of the management of these companies but it is limited to the borders of the companies. In the public sector where the availability of funds, time and training programmes is high compared to the private sector this 'learning philosophy' has not been created.

We believe that policies should have two objectives. First, they should promote educational and training participation for the groups and environments that show low participation. Specific actions are required for these cases in order to overcome existing characteristics and minimise social exclusion from a 'learning society'. Second, and more importantly, the cultivation of a learning society can have horizontal benefits for both individuals and businesses. The promotion of a learning society rests among others on educational/training institutions and on labour market institutions. The transformation of the educational system towards learning and less towards credentials, the accreditation of formal and informal competencies, the opening of more horizontal and vertical routes in the educational/training system, the stronger connection between VET programmes and the labour market (and not the transformation of the educational system to fit production purposes) are some of the required steps. In the labour market, working relations that enable or better promote work-related learning, meritocracy and continuing combination of working and learning could also contribute towards building a more 'learning oriented society'.

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Italy

Massimo Tomassini

Introduction

This report[1] deepens the analyses already carried out in previous research deliverables concerning two industrial sectors in the area of Rome: the first one producing software programs and services (inside the larger ICT sector), the second one producing audio-visual products (for public and private Radio and Television companies and, concurrently, for film industry). The following commentary present the main results of three different strands of activity:

– an analysis of twenty-four life stories of technical employees in companies of the two sectors;
– a case-study concerning a small-sized dynamic software-house;
– the main indications from a collective interview, carried out through a focus-group methodology, to representatives of VET institutions in the Rome area.

Such strands of research activity have been paralleled by a qualitative-quantitative analysis (including an ad hoc statistical survey) that shed light on the overall development of the two sectors at the local level, complementing data and information already presented in previous reports. In particular a statistical survey[2] showed that the weight of the ICT and Radio & Television Activities sectors on the 'Rome metropolitan area' economy is quite significant. The nearly 7,500 enterprises registered in the ICT sector in 2001 and the 420 enterprises in the Radio & Television sector, in fact, represent 3.6% of the about 224,000 enterprises (including all kind of enterprises, such as shops etc.) located in the capital. More generally, Rome is a centre of attraction for enterprises in these sectors in terms of the national economy. With regard to the IT sector and computer-related services, Rome hosts 9% of the enterprises registered in 2001 and a higher rate accounting to 14.5% of the radio and television enterprises. With regard to the employment weight, IT enterprises located in Rome employ 14% of all the workers of the sector at national level; the Radio & Television sector - as a result of the presence of the RAI - officially accounts for 54.3% of the total workforce employed in the sector, only in Rome. The rate of representation is very sensitive to company size; the increase of the number of employees corresponds to the greater rate of representation of Rome-located enterprises. This is due to the fact that

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[1] This report has been prepared by Massimo Tomassini, partner co-ordinator of the project Italian section. Collaborators: Michela Bastianelli and Fabio Roma. Special thanks are due to Mirella Lattanzi and Giuseppe Caporaso for their co-operation in collecting life-histories.

[2] The survey has been carried out through the following sources: 1. ASIA Archive (Archivio Statistico delle Imprese Attive) developed and maintained by the Central Statistics Institute for both sectors of the research study; 2. the EXCELSIOR database (private database on labour force characteristics, only for the SW sector; 3. the Quarterly Inquiry on Labour Forces, also developed and maintained by the Central Statistics Institute.

several enterprises with multiple locations (such as the RAI) have a head office in Rome. Besides being just a "simple statistical distortion", this figure confirms the complexity of the Rome industrial fabric: large companies located lead industrial filiéres richly articulated in terms of internal relationships and populated by SMEs at different level of organisational complexity.

Three quarters of Roman enterprises in the software and audio-visual sector, irrespective of the declared legal status, are in practice one-person companies, since they record no employee except the owner. However, in the IT sector, 30% of the enterprises with no employees are limited companies and 17% of these are partnerships. These figures further show the adaptability of a sector capable of (or forced to) constantly changing its structure through the formation of networks, partnerships and alliances although it is still disputable if ITC represents a real "industrial district" according to criteria dictated by local systems economics. Altogether, the production context of the ICT sector is highly diversified, with almost one-third of employees working with SMEs. Following the available statistical classification, the majority of employment (73% of the total in the sector) turns out to converge on activities which are generically referred to as "software supply and ICT counselling" including a wide range of services, from devising applications to co-managing innovation activities. Another relevant sub-sector is the one of "electronic data processing", whose incidence in terms of employment in the sector amounts to about 15% of the total.

The qualitative-quantitative analysis of the SW sector shows the existence of a significant stratum of SMEs, competing on a market in which main final clients are large companies, ministries and other public administrations, public utilities. From 2000 a severe rationalisation of the entire ICT sector has been taking place, following the burst of the "bubble" which in previous periods favoured the multiplication of subjects and activities. A number of small companies resulted to be reinforced by such rationalisation and compete through significant capabilities in terms of technological innovation, product quality and customer satisfaction. On the other side, life is increasingly hard for companies lacking such capabilities and exposed to growing risks of expulsion from the market.

Concerning the AV sector, it is largely influenced by the presence of major national broadcasting companies (RAI accounts for 75% of total employment in the sector) and by more limited activity of local broadcasters. The sector is characterised by a significant incidence of micro-enterprises (60% of which are one-person companies) operating in services and in pre- and post-production activities related to radio, TV and cinema. Typically, these micro-enterprises show a very high flexibility in relation to the general need of swiftly supplying products requested by a market which is at the same time closed, due to the overwhelming influence of major contractors, and dynamic, mostly due to competition and technological innovation linked to new digital technologies in cinema, TV, advertising, etc. Such structural dynamics entail several relevant effects in terms of co-existence of competition and co-operation among firms. It can be observed that there is an emergence – as a quite fuzzy phenomenon although reinforced by institutional policies – of a real "industrial district" composed by different specialised suppliers.

Coherently with the above data on companies and market, the analysis of employment structure shows that on-going restructuring is involving the sector's human resources. The demand for a new generation of goods and services by enterprises and households has favoured a certain employment growth among more qualified professional strata, as well as overturning and making obsolete the expertise of a generation of technicians whose training was based on previous technologies, platforms and programming languages. Many technicians of the past generation have been marginalised from production processes and, in the best of cases, just undertake management functions within their enterprises.

The "Excelsior" biannual inquiry on qualification – carried out through interviews to an extended panel of managers and entrepreneurs, shows for the SW sector a diversified situation, largely dependent upon enterprise dimensions. Very large enterprises – which produce idiosyncratic outputs, have a high technological content and are innovation-oriented – search for qualified staff, with a high basic education which easily allows the enterprise to re-orientate the acquired competencies through internal training courses. Small enterprises are often in the opposite position, because of the costs of internal training and of the type of their activity: they focus their search on a considerable share of young people, with little or no experience, who are suitable to carry out technical tasks, and they keep just a limited number of highly specialised staff who could enrich the enterprise know-how by integrating their previous study or work experience into the production processes. Medium-sized enterprises have rather recourse to people with versatile technical profiles who can massively exploit new technologies; they try to streamline the management and administrative structure in order to curb the costs but invest on staff internal and external training to increase the available human capital.

Given the above co-ordinates, the focus of the research has been concentrated on a variegated reality of small and middle-sized enterprise contexts, in which the research theme could be usefully developed. In particular, the main research question has been about the ways in which both companies and employees understand their own competence development needs and try to satisfy them. Some other questions concern issues which are parallel to the main one and can help in better focusing it, regarding for instance: the information channels used by people to get a job and to choose a VET/CVET pathway, the functioning of formal and informal devices for personal selection used by firms, the trajectories for "legitimate peripheral participation" leading to the full membership in contexts of communities of practice, and several others.

Life Stories of Technical Employees in Companies of the two Sectors

The interviewees

This section of the report is devoted to the life stories of 24 people employed in SMEs operating in the sectors of software production and radio and television production and

broadcasting in the area of Rome[3]. These stories have been selected from among a wide set of addresses – some collected within previous research phases – because they are significant regarding work and life situations which can be considered typical of the analysed sectors. This means in particular that low level profiles are relatively underrepresented in such a research exercise. In fact, also on the basis of preliminary attempts, it has been decided to invest the largest amount of time resources on people having dynamic experiences on work and competence development trends. Interviewed persons were, on the average, aware of the social-cultural dimensions of the research issues and able, at the very end, to shed light also on more disadvantaged paths within their sectors. However, the approach that was applied to the collection of auto-biographies[4] tended to highlight relevant meanings concerning personal and professional life of interviewees while allowing them autonomy in telling their stories.

General data concerning the protagonists of the stories can be summarised as follows. Considering the totality of interviewees the average age is 35; the educational qualifications are of middle-high level (half of them hold University – mostly non-technical – degrees). In the software sector regular contracts and middle-level qualifications are prevailing, while people in the audio-visual sector are mostly employed on the basis of temporary contracts and have a status which is closer to free-lance collaboration than to employed work (one of them is employed in a family-owned micro-enterprise). All the interviewees have been working for more than five years, except two – at the lower level – in the SW sector.

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[3] Interviewees profiles

SW sector **: D.T.** Webmaster and production supervisor at "Webintouch"; **C.R.** Project co-ordinator at "Alphalogic Computer"; **R.M.** Computer engineer in a small telecommunication and computer company; **A.C.** Web graphic designer in a small software house; **A.T.** Analyst-programmer in a consultancy and computer management company; **A.N.** Computer technician in a software service company; **S.C.** Webmaster in an Internet-based small company; **S.C.** Software designer in an Internet-based small company; **V.R.** Analyst-programmer in a small software-house; **P.A.** System designer in a middle-sized software-house; **E.D.** System designer in a small softwarehouse; **I.G.** Programmer in a middle-sized softwarehouse; **L.G.** System designer in a micro software-house; **G.I.** System designer in a middle-sized software-house; **G.D.C.** System designer in a middle-sized software-house.

AV sector **: F.Q.** video technician in digital post-production processes at "Satellite TV"; **V.T.** Freelance digital cameraman; **A.C.** Freelance shooting equipment technician; **S.C.** Freelance large screen operator; **S.L.** Editor and director's assistant in a small production and post-production company; **G.F.** Co-ordinator of a daily information programme at "Roma Uno"; **S.M.** Camera operator in a micro family-owned company; **G.C.** TV journalist at "News Press"; **G.C.** TV journalist and editor at "RTL".

[4] The methodology followed in this research activity has been generated according to the indications of different authors, in particular: L.Formenti, *La formazione autobiografica. Confronti tra modelli e riflessioni tra teoria e prassi,* Milano, Guerini, 1998; M.Castiglioni *La ricerca in educazione degli adulti. L'approccio autobiografico*, Milano, Unicopli, 2002; A. Alberici, La parola al soggetto, Guerini Studio, 2001.

Educational and professional careers have been complex for the majority of SW technicians. Many of them have started to work in the sector quite late (just before the age of 30), being employed in activities not related with their formal education profile. VET has in fact represented for many of the interviewees a crucial chance in terms of life and work turn-around. Audio-visual professionals, on the contrary, show more linear behaviours: job choices have been more precocious (most of them started in their early twenties); they found their present job following a clearer bent, through the facilitation of social relations, in many cases without recourse to specific previous training experiences. In general, in the audio-visual sector there is a remarkable gap between educational and professional pathways.

Assuming the ISSTAL model as a frame of reference, the above presented economic patterns and trends represent the "situational factors" while more in-depth traits of the overall behavioural characteristics of the sample can be traced as follows.

External variables

Most of the people in the SW sector addressed themselves to VET after discovering that their formal education title had low value on the labour market. Considering the graduates, only 2 out of 7 carry out a profession coherent with their title. Therefore it is the lack of positive relations between the educational system and the labour market that can be considered as the main external variable triggering the choice for attending VET courses in that field. VET courses, offered within public programmes of Regional VET institutions (free and certified at the regional level), although not socially acknowledged as important channels for professional achievement, seem to have unexpected returns. People use them as bridges to a new job and, in many ways, a new life. In particular within the SW sector the decision to attend a VET course has been a real turning point for most of the interviewees. Within personal stories characterised by several uncertainties and fluctuations, such a choice seems determined by chance and social imitation in some cases and, on the contrary, by the awareness of the need for self-re-orientation in other cases. One of the interviewees declared:

> *"I did not have a marked bent for information technology. I happened to be in that course by chance, just to find soon an acceptable job. As I was attending the lessons, I got more and more involved and finally I was really very keen on it". And another one: "Discovering the possibility of creation and imagination which is allowed by information technology has opened my mind: I discovered I had a lot of opportunities I hadn't thought about before. It has radically changed my life ".*

The positive judgement on initial training expressed by software technicians is even enhanced concerning their further training experiences. They believe that attending VET courses can help in acquiring and updating appropriate competencies that are essential to get and maintain a job. Concerning SW technicians, the distinction between initial and continuing VET courses does not seem fully perceived. They interpret the courses as resources that have been subjectively exploited for work and social purposes. In some cases the cultural and attitudinal background (in particular for those holding a degree in humanities or social science) represented a very good presupposition for open-minded choices related to a new professional trajectory in technological field. In other cases basic

scientific knowledge and familiarity with IT tools helped in understanding the appropriateness of chosen VET initiatives in relation to a new work and life project.

Concerning AV technicians, the external variables influencing their vocational choices are less related VET. Their stories are in many ways more linear: choices followed by a will to initiate a professional trajectory deemed to be very attractive and allowing them to find good jobs. Almost all the involved people have learnt their basic skills through coaching and on the job: in some cases, the apprenticeship has taken place in parallel with normal school pathways. Only 2 people have attended specific initial training courses. Their appreciation with respect to training as a career starter is lower than the one expressed by software technicians. Their interest towards continuing training is on the contrary sharper, although "continuing training" means something different from what is generally understood for VET. The majority of the interviewees in the AV sector expressed their interest for highly specialised courses, provided by private companies at high prices. One of the stories reported a clear success through this kind of training that was key in acquiring new knowledge for a new and well rewarded job.

All interviewees have had an easy access to the available information about training resources. Many of them consider well the available information sources such as the press and the Internet, as well as communications on official bulletins and magazines, which they looked up directly or further to a suggestion from their own social networks.

Social background and social role variables

All the interviewees belong to social networks – and more in general to social environments – which somehow stimulated their choices, often alternative to already established educational/professional paths. One of the interviewees declared:

> *"My family wanted me to keep the tradition and to become engineer as my father. I enrolled to the university, but was somehow troubled. I felt pressed to do things I didn't feel like doing. I would have wasted many years if I had not had some friends already working in the cinema industry. They helped me work in an environment I've always wanted to work in ". And another one: "I studied physics, which I was really fond of. I tried with the university career: unfortunately the job of researcher has turned out to be uncertain and little paid. That was a luxury I couldn't afford. A friend convinced me to attend a course for SW design and management and to propose myself as a candidate for a post in a company which was investing on talented young people".*

The main features of the stories in the SW sector are represented by the variety of educational choices and by the dichotomy between the family wishes and the later on discovered vocation of the interviewees. Such a dichotomy is less easily perceived and relevant in the biographies of AV operators. They claim having followed their own vocation, often supported by their family or friends and enhanced by attractive opportunities. We quote once again from the interviews:

> *"I am a TV operator, and I've always liked to do such a job since I was a student because of its charm of allowing contacts with famous people... A school mate, who was the owner of a video-production firm, helped me ".*

> *"I studied accountancy, but I couldn't imagine myself behind a desk. I had a bent for manual skills. My uncle helped me: he works in the cinema industry and suggested to me a course for projectionists. I attended it profitably and with pleasure and I found a job immediately".*

This type of family and network influence is largely coherent with some of the characteristics of the AV sector in the Rome area. In particular it is coherent with the "district" structure of the sector, composed by a few large companies (RAI, Cinecittà, Mediaset) and an interconnected filiére composed by a multitude of small and very small post-production service companies. The latter, given the long-lasting cinema tradition (related to the well known Cinecittà studios, and several others), are for the most part family businesses with an average size of 3 - 6 employees. This is probably one of the reasons for which, as we will see further on, many of the people interviewed do not need or do not feel that they need to do a vocational course but they have learned everything they needed directly on the field maybe, as in the case of some interviewees, already at a very early age.

Personality and intellectual capacity factors

Adaptability seems to be the main common trait of the interviewees, although with differences due to personality and intellectual factors. A first group, including most of the 9 AV professionals, who were better able to follow their own vocation, show in particular a strong character allowing them to stand out for a better and more coherent planning of their pathway, which implied the identification of a set of intermediate steps to achieve the expected objectives. Another group seems to adapt to different situations through endowments of personal autonomy. These people have in common a versatile intelligence, many interests out of their work, and relations with different social networks. Their sense of independence pushes them not to exclude self-employment in their future. This hypothesis can be traced mainly among SW technicians who tend to suggest it with respect to their current field of activity and to other sectors as well. Moreover, it is extremely significant that this sub-group includes all the three women who were interviewed. Several interviewees showed significant effectiveness levels as far as personal relations are concerned, both within working situations and larger professional communities (even virtual communities). Intrinsic communication abilities are often key in the creation of a co-operative climate in the work environment.

Two people in SW represent the 'disadvantaged area of work' (of course not in a proportionate way, given the extension of the latter in the overall reality of the SW industry). As other young people who provided their life histories, they attended VET regional courses as drop-outs from the University system. They reinvented their own lives through such courses that allowed a quick entry in the labour market and eventually a job (one as SW technician, the other as webmaster). But the companies they joined are at the bottom of the scale both in terms of firm effectiveness and quality of work. Work is at present not a gratifying activity for these two people: there is no challenge for creativity, any sense of achievement is frustrated. This is due to very tight time schedules, bad management (not only in terms of HR management but also of project management), and the fact that no innovation is introduced in work processes. Some competencies acquired

within the regional course tend to be exhausted while the few good chances of learning from clients encountered in work experience have already vanished.

Despite such a negative picture, both the interviewees in low quality contexts tend to keep an optimistic attitude towards the future. An important role for further more favourable experiences is attributed to the regional CVET system. Both technicians are searching for new training opportunities that could help them in upgrading their own professional standing. Guidance services might be of great help but at present there is practically nothing in this field, which can be considered as the most remarkable deficit of the VET system. The latter seem to provide good support in terms of courses but nothing as far as personal guidance is concerned, i.e. for a very delicate function, probably the most strategic for this kind of audience.

Retained information

On the average, as already outlined, the interviewees have a middle-to-high educational background, which has formally in many cases a superior standing in comparison to the kind of job they have chosen. This is not in contrast with their current work situation, which is generally perceived as positive. SW technicians skilfully manage to combine personal values and 'typical' values of their profession: dynamism, personal mastery, problem-solving (even in a sort of altruistic stance), and overcoming traditional approaches to life and work. For instance, some interviewees proved to be very much interested in exploring the possibility of overcoming the trade-off between competition and participation by taking their cue from their daily life, where they do not perceive such a sharp gap between individual acknowledgement and sympathetic and co-operative practices. AV operators appeared as more prone to highlight their creative contribution in designing and implementing 'cultural contents' for a widespread exploitation, to which they link the possibility of a personal display and social visibility.

Perception of Work

In both sectors, daily work is perceived as "complex and difficult" due to the intense working pace and the high level of concentration needed, but no one among the interviewees complains about his/her lack of personal competence with respect to the tasks to be carried out. On the contrary, more often the capacity to cope with the engagements and with unforeseen events reinforces self-confidence and allows them to face external interferences within work environment. In the AV sector the latter aspect is more present, as highlighted above all by technical profiles. One of the interviewees stated:

> *"When I started as an apprentice I did many different things, because in our environment we have to be ready for any emergency... Specialisation is necessary, but flexibility is also needed and above all, we must be able to keep calm in critical situations because what is mostly demanded is to quickly and effectively solve problems".*

This interview and some others highlighted a generalised stress on the interviewees' personal role in the production process and a diffused bent for an individualistic approach to work.

In the SW sector the co-operative approach seemed to prevail, as the organisation is generally more structured and work relations are more based on permanent contracts. Moreover, working in projects implies that goal sharing and relational capabilities are crucial. As highlighted by one of the interviewees: "Relations are very important, and they are often the critical point ". Even if associated with the need to constantly enlarge the working hours (in average, not less than 9 hours per day), team work has been considered as a very important resource by all interviewees. Teamwork is in fact deemed to be a support in difficult situations, a natural environment for informal exchanges of information and knowledge, a stimulus to enrich one's competencies. New technologies, which are a fundamental component of the work environment, are also considered as a spur to personal creativity and imagination as well as a common basis for meetings and discussions.

The perception of the work environment seems also influenced by belonging to professional aggregations which are numerous and varied in the SW sector, like teams (more or less stable, depending upon project duration) or even broader aggregations (with colleagues, customers, other practitioners). When work is carried out at the customer's premises new 'communities' are formed, composed of technicians belonging to different companies and involved in specific segments of the same project. Other important aggregations, also positively influencing the perception of work, are those created by the 'exchange' of specialists between SMEs in relation to the implementation needs in specific work phases. Both in small communities and in broader ones, mutuality and support outline the work environment as a place for self-expression and creativity, which is characterised in most cases by a good quality of life.

The two young SW technicians employed in lower work quality settings, characterised by bad management practices, a reduction of technical resources and fewer external relations, expressed a negative perception of work. Both young technicians hold a precarious working position: work contract obligations are not respected, work activities are of a repetitive nature and are carried out in a nervous and depressed climate. Even if they defined such work experience as useful anyway as a survival test and therefore as an opportunity for personal growth, in the very end both witnessed their lack of self-confidence and their worries for the future. One interviewee said:

> *"Beforehand [that is to say, before, the company's decline] the environment was lively, now it is just routine. I am working alone in front of the computer all the time and I easily become irritable. I am not even able to avoid bringing my uneasiness out of the company ".*

Competencies development

The biographies keenly underlined the issue of technical competencies as crucial 'tools' which are deemed to valorise professional roles, to allow visibility on the labour market, and to enhance relations based upon mutual consideration and trust. This seems true for

dynamic SW enterprises, which consider technical skills as strategic capital allowing durable development. In such contexts the interviews highlight common views between workers and companies: for the former technical competencies allow them to keep and improve their own working conditions; for the latter, these help them to be more competitive. In stagnant contexts, like those of the two young people mentioned beforehand, there is not care for such technical resources embedded in human resources. The gap between the two typologies of enterprise reflects upon individual pathways.

In dynamic contexts relevant importance seems attributed to competencies that, according to recent literature, could be referred to a wide-scope *work process knowledge* allowing people to operate coherently with contextual inputs and to understand the connections between different roles and activities. These competencies are felt to be crucial but, in parallel, in the majority of cases are not consciously managed either by enterprise management or by the interviewees themselves. The latter recognise the importance of work process knowledge and nevertheless generally tend to consider it as 'self-generating' through experience.

In particular, as far as relational competencies are concerned, which represent significant components of work process knowledge, the enterprises seem to adopt a laissez-faire attitude. Relational competencies fine-tuning and exercise are largely left to the sensitiveness and availability of each single employee, except in some limited cases where training courses or organisational development actions are at least taken into account as possible choices. Interviewees claimed that relational competencies are very important and that they devote a great deal of attention to them. The need to carry out one's own tasks in a harmonious context, where conflicts are controlled and personal abilities can emerge, at best seem to foster behaviours oriented towards a balance between competition and the defence of a 'common good' constituted by co-operation and shared values.

Concerning the reward of professional competencies, the majority of interviewees declared their appreciation for them, even at an informal level (praises, words of estimation by superiors etc.), while, considering the critical situation of many enterprises, it is generally accepted that more substantial rewards (bonuses, incentives, fringe-benefits) could be at least postponed to better times. The need of an acknowledgement of acquired competencies, even at an informal level, rather represents a parameter for evaluating the enterprises' 'intentions' and projects for development. In the same way, the supply of education and training programmes is appreciated not only per se but also as a tangible sign of a company's health.

In the audio-visual sector, competencies that interviewees mostly deemed worth mentioning, those that deserve being enriched and updated, are the technical ones. Yet, the approach is rather different with respect to what has been remarked about the SW sector, due to the reduced weight of stable organisational variables. In some cases the importance of technical competencies has been recognised from a merely functional point of view, in terms of acknowledgement of their being money- and time-saving. In other cases the crucial link has been underlined between technologies and artistic personal

capabilities (expressiveness, sensitiveness, etc.). Improving or enhancing these competencies has been deemed to happen outside of formal pathways and as a result of learning by doing and critical self-scrutiny of outcomes.

Learning from others (work groups, communities, networks)

All interviewees were aware of the need for continuous learning and behave coherently. It seems possible to define them as lifelong learners or learning aware. Their learning practices consist of a mix of activities aimed at improving both experience-based knowledge and codified knowledge. The former is acquired and developed through implicit, and yet fundamentally important, chances for organisational learning provided by daily working life of which the majority of interviewees seem aware. Especially within more dynamic firm contexts, experience is enriched through the variety of external relations (with customers, other technicians, suppliers, etc.) and of internal relations (within project teams, with more experienced colleagues etc.).

Behaving in group situations is considered a basic but effective chance for learning. As somebody said among the interviewees, group behaviour represents the "reagent" for assessing one's own level of understanding of the overall framework and, at the same time, both the site for conflicts and the compass for organisational orientation. As already seen in relation to attitudes towards work process knowledge, the understanding of the 'place's style' emerges within daily experience and relations with the reference community. The implementation and development of individual capacities do not happen in a 'vacuum' of exchanges and contexts but rather in the 'full space' of a participation – more or less aware, more or less competent – in specific organisational communities. Their role is well expressed in statements such as "…community environment enriches from any point of view", or

> *"…even if competition starts to show up among us technicians, there is still a good margin for cohesion and reciprocity. Yet, it should be really important to have the capacity for more cross-fertilisation and for achieving a shared language and a common overall vision".*

Even limits to local community co-operation are perceived as a burden to be overcome:

> *"…stopping to reflect with other people on what we are doing is a luxury we can hardly ever afford. It would be important to understand things when we are doing them. On the contrary, I often find myself reflecting upon them alone, or asking my friends for suggestions".*

Actors suggested the existence of a "hunger for a sense" within different contexts, or, in other words, the need for collectively surfacing the characteristics of local organisational knowledge. Besides previously reported observations concerning the positive perception of belonging to professional aggregations, it must be noted that a significant part of professional learning is acquired through participation in communities and networks of different kinds. Interviewees in the SW sector feel themselves as components of different, real and virtual, communities (with clients, technology providers, other professionals) and consider it as a quite important ground for developing their own competencies outside formal arrangements. As one of the interviewees recounts, "the coffee shop easily becomes a place for technological communication" favouring exchange between

professionals that work in the same sector. Several chances are daily encountered which are deemed to be sources of learning: "sometimes I feel I learnt a lot by a simple phone call that allowed me to get informal advice based on experience in similar situations". Another source of learning quoted by different interviewees were *freelance experts* that deal with specialised services in different environments and consequently contribute to experiential knowledge circulation amongst companies.

Recounts of interviewees in the SW sector show that 'learning' is often nothing else than 'sense-making': interacting within communities and networks is a fundamental way for constantly re-building personal cognitive approaches to specific issues and re-constructing the sense of the whole work experience. As for the AV sector, experiential and social learning are widely diffused, and nevertheless their importance in less acknowledged than in the SW sector. In particular experiential knowledge can be shared within several communities. Even if relational intensity of the sector seems lower than in SW, because of temporary employment and more individualistic approaches, the interviewees seemed to detect the existence of several communities whose members are linked to each other by mutual esteem and/or common projects. Some of these communities appear dynamic and open, even extended on a global level through the Internet.

Self learning and company training

Concerning codified knowledge the interviews highlighted a significant diffusion of *self-learning* practices, strictly intertwined with the above learning and sense-making activities. In the SW sector the interviewees – as already noted – consider people pay great attention to enriching their skills and are prone to build-up their own competencies by exploiting a wide range of options: they frequently study books and handbooks, navigate specialised websites, attend targeted newsgroups, subscribe to specialised magazines and journals. Even the two technicians operating in low level contexts try to keep updated through self-training (books, reviews, web information), although this cannot fill the gap related to the lack of significant working practices.

However, although the importance of informal learning is recognised and self-learning is widely diffused, most of the interviewees clearly acknowledge the need for structured continuing training interventions. The urgency of a 'knowledge methodology' is expressed by one of them:

> *"…I feel the need to go back to study. At a certain moment one needs to link experience and informal learning with something more structured. Books, reviews, the web are not sufficient: you need a systematic approach, a method. And you can obtain this only through real training courses".*

Secondly, many interviewees consider training as a key solution to the expectations of achieving an 'overall vision' in terms of work process knowledge.

A number of interesting experiences of company training have been identified through the interviews. Of course only dynamic and planning-oriented companies can provide structured courses while the great majority of SMEs tend to put in place short interventions in terms of on-the-job learning and, in one case, of coaching. Structured courses usually involve employees having an experience of a medium-high duration,

usually last from 2 to 5 days; sometimes outside the firm's premises, more frequently inside; quite often beyond the working hours; mostly aimed at developing technical competencies.

Employees generally appreciate very much this kind of intervention, in many cases provided upon their own request. Such an appreciation is first of all about outcomes at the personal level. Training is seen as "useful to more systematically re-start cognitive and imaginative faculties". Moreover, as already outlined, a strategic and symbolic value is attributed to training opportunities: several interviewees claimed they appreciate training provision as a sign of interest from the firm. As stated by one of the interviewees, "now that I'm working within an enterprise where I can undergo training during the working hours and this is paid by the company itself, I feel successful. I am a privileged person with respect to other workers". The provision of training pathways within company HR plans is frequently considered as an important variable for the orientation of employment choice. The great majority of interviewed SW technicians consider keeping their own jobs largely depends upon the improvement of their own real competencies and that training plays an important role at this level: "training is fundamental. Otherwise, you keep on staying at a low level: even good professionals are at risk without training. If they undergo little training, they are not visible on the market".

Concerning the weakness points of company training delivery, some of the interviewed employees underlined negative aspects such as low quality of teachers, unfriendly modalities (too often beyond working hours), and high costs. Moreover, non-technical training was considered too rare, while this was seen as of major importance mostly in terms of rationalisation of informal learning outcomes. In general, the lack of adequate training provision was a complaint of a number of professionals. Very often enterprises do not want to "distract" their personnel, even for a short time, from working activities. This is considered incoherent management behaviour, provided that management usually shares the employees' concern about training as an important component of competence updating.

In the AV sector – as already noted – learning by doing is largely prevailing. Structured continuing training opportunities are mostly offered by technology providers. Opinions in this regard are not homogenous but quite significant. Most technicians, who consider the courses they have attended so far as basically useless ("they are just for selling new machines"), prove to have a more precise idea of what is a real training course. While the minority who appreciate these courses is made up of people who are more prone to confuse training with mere familiarisation in the use of equipment. The most important information at this level comes from interviewees who attended private very specialised high-cost courses and found them very important for their professional development. One of these interviewees told that he spent all his savings to pay the fee of a costly course, attended it and from then on received several offers which allowed him to eventually 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 but the interplay between personal experience – through which the young man was able to understand a specific

knowledge/competence need in his working environment – and formal training activities which could be found on the market and could satisfy such a specific need.

In some cases forms of quasi-structured learning are reported, devoted to updating specialised technicians. In one of the visited micro-enterprises, for instance, learning of associates resulted from being under the authority of the responsible person of the technical structure (the "number two" after the entrepreneur). He usually follows up individuals' learning "for all the time which is necessary to make them autonomous. We need on average a couple of years to train a good technician". This is a good example of practices mixing on-the-job training and coaching that are much more accepted in the sector than traditional formal continuing training.

Case Study: LMI in Gegneria Informatica

Profile of the Company

LMI Ingegneria Informatica was founded in 1999 on the initiative of an electronic engineer highly skilled and experienced due to previous activities within multinational companies operating in the military and aerospace sector. The entrepreneurial abilities of the founder were first developed in the setting-up and management of another small engineering and research company, and then in the foundation of LMI, together with a small team composed of former collaborators of his.

Since the start-up the firm strategy has been focused on the founder's efforts for acquiring a specific position in the software market. The mission of LMI is to provide customised SW packages and Internet-integrated applications to a wide range of businesses and institutions. This implies that firm activities are composed by a mix of technological and consultancy approaches and are based on close relationships with client organisations. Besides providing customised products and dealing with the continuous evolution of these products, LMI is able to flexibly provide know-how to customers through outsourcing one or more of its staff (at present 4 people) for limited periods of time on the basis of specific contracts.

Flexibility of LMI mainly derives from its small size (total 15 employees) and its participation in a network of small companies and single experts providing outsourcing services in relation to the specific skills and experience needed for a specific 'component' of the process. This kind of network is typical of a sector in which intellectual capital is the most precious resource and market exigencies are extremely varied. Therefore, the firm's flexibility is mainly linked to a technological strategy based on processes of continuous differentiation in business services, since the variety of developed services is not focused on a particular technique, but on the contrary on the advancement of a rather large range of supply.

The interaction with customers influences very much the kind of needed professional competencies: it requires a close link between marketing and technical abilities. Moreover it requires co-ordination, integration, fast exchange of information and procedures in

order to satisfy both the technical requisites of the product and the performance requirements of the customer enterprises.

LMI employs a total of 15 people with a variety of employment contracts: 50% of personnel are recruited on permanent contracts, the others hold atypical contracts, including 3 apprentices and 4 in outsourcing. As a whole, this workforce is highly skilled, 5 people hold degrees in scientific and engineering disciplines, one in law and one in economics. The others possess secondary school-leave certificates. Some of them experienced public VET courses at different level. Almost all the staff are employed in technical functions, except one commercial/marketing officer. Lower level qualifications are required for a secretarial work (1 person) and data entry (2 persons). All the staff, except the apprentices and the marketing officer, has been working in LMI for at least 3 years.

Management and organisation

LMI's entrepreneurial model is centred on the founding engineer, who deals with all managerial aspects and technical matters, in close co-operation with the small team which initiated the company with him. All key organisational functions are performed by the management team, in which core specialised skills, such as the original ones related to the processing of GIS-mapping data, are combined with several other technical and managerial capabilities acquired over time. The most characteristic activities and capabilities of LMI are those linked to the exploitation of Internet resources. Most of the new information required for developing new products can be found on the Web, for free or bought from highly specialised providers. In some way this is an activity that could de defined as research, although no formal R&D department has been established in LMI. People in a specific team spend in fact most of their time in researching new solutions through the Web. This way of exploiting the Web is typical of the hi-tech product innovation-based model whereby enterprises can profit of opportunities of technological change following a product innovation-oriented strategy aimed at the expansion on new markets. The integration of ICT applications is aimed, from this point of view, at gaining competitive advantage and achieving positive results in performance indicators.

The Internet information processing team consists of 3 employees: an engineer, who has the role of technical supervisor; a graduate in economics, who acquired considerable skills in software development through both work experience and vocational training; a young graduate in engineering (holding an apprentice contract) who permanently joins the team also with a view of assisting in the development of firm strategy. The research team processes the available information in order to find codes and programmes to be developed, mainly from open-source packages that are both cost-effective and flexible. The research activities are conducted with two objectives: either to find a software solution for a customer or to develop a new product for the market that has not yet been explicitly requested by a specific customer. In the first case, the research activity is highly targeted and technical/economic parameters are defined. In the second case, the research activity is left up to the team, which has to find satisfactory solutions in terms of both technical feasibility and economic returns.

Human resource development

Firm roles are interpreted so that in particular situations of work overload everyone can carry out tasks that are not strictly pertinent to their function. On the other hand, there is a certain level of formalisation of roles for reasons linked to the planning of firm's development. However, *creativity* is the leading value. It mainly regards the fostering of innovative solutions and product testing. Technicians are usually extremely free in their work and are stimulated to suggest new product solutions stemming from their intuitions. Of course for low-profile staff asked to perform routine activities, creativity has a different meaning. It is achieved mainly through stimulating a dialogue to put forward suggestions and proposals aimed at improving production processes.

Flexibility and creativity imply an organisation open to information and knowledge sharing and in which values such as those attached to co-operation and motivation are highly rewarded. Although not explicitly discussed, the *community of practice* approach is largely present in both organisation's members mindsets and in management style and choices. Internal meetings, for instance, are organised in informal ways and largely based on free dialogue. The staff are given a strong sense of responsibility through direct assumption of responsibilities, autonomous handling of the relationships with customers, and self-management of working times. More than half of the staff's working time is spent in team working. According to the firm's principles, people must feel free regarding their creativity and not be afraid to compete one with another, given the common background of co-operation.

The firm's HR policies include both salary and non-monetary incentives to stimulate and reward the achieved results. The method adopted implies that any incentive is negotiated on an individual basis according to the objectives to be achieved, for instance in terms of turnover (for the commercial manager) or product delivery within established deadlines. In general, the incentive consists of monetary rewards which are established once in a while. However, career progress is mainly based upon seniority and only subsequently upon achieved results. The adoption of such human resource policies has been favoured by recruitment options. So far the company has mainly used informal word-of-mouth channels to recruit personnel. Other channels like ads in specialised journals and the company website were also used but they have been undoubtedly less important than the informal channels that most personnel come from. The selection criteria are based on factors such as: suitability with regard to the role to be undertaken; interest in business activities; abilities in terms of teamwork, communication and social skills. The only exception has been the responsible person for the commercial area, whose selection criteria have been mainly related to his customer portfolio.

Knowledge and learning

The setting-up of LMI can be considered as a form of spin-off in which a small group of engineers managed to develop a business project by exploiting their previous knowledge. Such knowledge does not simply imply technical skills: knowledge in this case is not just a synonym of know-how but must be understood in a broader sense, including *know-how*

(how to apply technologies), *know-what* (where and for which service to apply the technologies) and *know-who* (which customers to focus on to develop product lines), as well as *know-why* (scientific understanding of the phenomena). LMI is mainly aimed at developing the aspects of know-how and know-who in order to define its niche of business activity.

As a whole the firm's *modus operandi* reflects the need to 'capitalise' the variety of acquired skills. Accumulated experiences, for instance, are codified as much as possible within company handbooks and kept in specific repositories. However, the fundamental aspect of the firm's learning is its dynamic nature: it can be considered as the one that literature in this field defines as "learning by interacting", especially as far as external learning is concerned. Management is fully aware of both the importance of experience in increasing professional competencies and the need for a knowledge management aimed at learning by interacting. Learning does not grow only "by doing" (i.e. accumulating experience in repetitive processes) or "by using" (i.e. gaining incremental abilities in using machines and devices of different kinds). Learning development in LMI is in fact due to the combination of different factors: the systematic exploitation of the web and its global-scale opportunities, the participation in the above mentioned experts network, the relationships with technologically advanced customers, and more generally the participation in the local innovation system of the Rome area.

Internally, previously indicated policies for fostering co-operation and social-professional identity – implicitly applying the *communities of practice* principles – constitute of course the background of significant forms of organisational learning. Given the high specialisation of the activities, competence development and learning in LMI largely depend on real flows of knowledge. This is why newcomers' knowledge is not considered in terms of their stock of knowledge – although of course already acquired skills are evaluated in the selection phase – but as something that has to be smoothly absorbed and worked through within the knowledge and learning fabric of the firm. As staff selection is based upon motivation, the development of specific competencies is de facto postponed to the moment when the worker is integrated into the company's activities. This approach implies that acquisition of tacit knowledge is expected to result from in-company immersion.

Training policies

Practical training is at present considered as the main instrument for allowing learning at all levels. This is why – after hiring seven people in order to enrich the original nucleus – apprenticeship has been chosen as the typical form of work inclusion, to be developed in the future. Three apprentices work at present in LMI, one – as already mentioned – in the team of developers and two in the lower qualified staff – although they are also graduates – engaged in data-entry activities. They participate in the company's life and are also involved in more formal aspects, such as periodic meetings with the owner, in order to assess their social learning abilities and to foster their membership in the company community. Previously hired personnel were socialised through coaching by members of the nucleus and through internal training courses held by both those members themselves

and by external experts. After such initial experiences some further training activities have been carried out in the last few years upon request. As a matter of fact external courses for core technicians have seldom been demanded, and in each case the request was approved by top management after scrutiny for their positive effects and immediate application to working routines.

The data entry group (2 senior and 2 trainees) acquired work competencies mostly through coaching by expert personnel and less through training courses. In general, the preference for coaching derives from the owner's idea that training in worth financing only when it is functional to some sort of practical application in the short term. However, the top management claims to be open to assess proposals linked to the willingness of professional growth. As far as outsourced technicians are concerned, they do not participate in training courses. It could happen within the firm they are operating in, but this seems a rather remote hypothesis. As previously reported the large majority of training courses in LMI are of an in-company type. The top management's training philosophy is that training has to be connected to firm's specialised technical needs and that it is impossible to find suitable modules on the training market for such needs.

Training in this perspective covers a specific phase in the competence development process. Given the reference market and the way of interacting with customers, most of the staff have to be able to meet customers needs without being stiffly linked to routine approaches and therefore they have to be able to acquire new competencies in order to provide new solutions: briefly people have to develop individual/team problem-solving and decision-making approaches. This implies that people understand the specific needs of either updating possessed technical knowledge or acquiring new knowledge. Training is a type of explicit knowledge refilling.

A significant component of internal training activities is based on structured knowledge tools, such as the technical handbooks, collected over time in relation to specific work issues, which are deemed to be strategic for the workforce's learning and professional growth. Every course implies that technical documents, such as handbooks, are prepared by the teacher with possible integration from external sources (scientific literature and information available on the web) in order to allow participants to have practical tools for problem-solving at work. Internal training is delivered in the company premises and mainly in a classroom equipped with multimedia tools. Those who are more involved in training activities are the technicians and the commercial manager.

Courses can have a different duration (from one week to some months, of course requiring only a few hours per week within a flexible timetable consistent with the company's activities). Internal training is solely technical and focused upon IT subjects (e.g. programming languages, operational systems, database management, application software, GIS elaboration, CAD, multimedia applications, and the Internet). Courses are designed so as to include a theoretical part and a practical module which should preferably be applied to work activities in the short term. Over time this pattern of training organisation and delivery has become a business. LMI experienced several occasions of providing its own training contents – with specific adaptations – to customer firms on the

basis of common needs, like those of protecting acquired competencies from obsolescence and of developing human resource according to both the enterprise's and the individuals' exigencies.

The supply of training courses outside the enterprise reached its peak in 2002, when the company invested to promote its offer through such channels as advertisements in specialised magazines, as well as on the web, and through distribution of leaflets. The courses, delivered in the company's premises, include a wide range of IT and technical modules lasting from 20 to 60 hours for IT lessons and from 5 to 40 hours for other technical subjects. Customised provision in terms of both contents and timing is also possible. Several courses are being at present carried out with classes of 5-20 people. However, LMI is planning to reduce such training activities although they are still included in the overall offer of services. This is due to its low effect on the turnover, if compared to the work that is required.

Perspectives on learning and training

As in the great majority of SMEs in that specific stage of life, contradictory factors are accumulating in LMI learning strategies and practices in relation to business development. From one side the company follows a canonical development path based on expansion of successful activities sustained by continuous growth of internal competencies. Such growth happens of course at the technical level: people become more and more expert in finding technical solutions appropriate for customer needs. But from the other side the model of learning by interacting, externally and internally, which underpin business development is not at all consciously cared for as such: the spontaneous model of the early start-up is kept in place although roles and relations are becoming increasingly complex. Non-technical training, for instance, is still overlooked: learning sources stem from daily practice but the company does not make any systematic investment for a better understanding of the functioning of such sources. Relational and cognitive issues that allow the company to keep on going and producing good results are de facto disregarded. No specific problem has been so far detected in the organisation's functioning but it is likely to forecast that further levels of business expansion might allow discrepancies and points of crisis to emerge due to the combination of social and technical factors.

Several effects of the accumulation of 'skilful incompetence' might be expected in an organisation that does not develop specific plans for professional growth. The company's small-size allows fast knowledge sharing among people, ensures less dependence on a single resource and improves role flexibility. Yet the company's model of investment on human resources should be developed in order to comply with conditions of both keeping resources that can hardly be replaced and achieving long-term objectives. Moreover, the occurrence of significant reshaping of technological activities due to breakthrough events, or even to the effects of incremental innovation in the field, might cause unforeseen problems in an organisation that is not used to systematically reflecting on its ways of interacting with the external side, of being the locus of community practices and of applying technological solutions. The fast succession of packages, systems and

software languages implies quick obsolescence processes in staff competencies that are not only of a technical nature but also relate to trends and basic meanings in the field.

Of course the solution of such a contradiction is not easy and nevertheless the imagination of experts and policy-makers should be largely exercised on such issues, avoiding reiterating proposals that have already encountered several failures. In particular, it must be considered that external training courses are hindered by the small size of the company, which cannot afford a high investment in training and cannot keep the human resources involved in training for long. It is very well known that distracting, even partially, one or more persons from their ordinary work can have a significant impact on a small-sized company. The case of a dynamic and healthy hi-tech SME seems to indicate that CVET should suggest something for assisting the development of this kind of enterprise but this should consider the company as a unity – not only its individual members – and should take specifically into account the already developed external and internal learning paths.

Focus Group with CVET Practitioners

Introduction

The focus group was attended by seven representatives of VET institutions operating in both SW and AV sectors in the Rome area, four of whom had already been pre-interviewed individually at their own places of work[5]. The focus group, conducted according to the Kruger's methodology[6], was aimed at verifying different issues arising from the research activities (life stories collection and case study). A total of ten questions were asked as suggestions for the debate. Some 'rules of the game' were previously presented in order to reach important goals such as: openness of the discussion, expression of different opinions, and usefulness of the results for the overall research goals. The meeting has been eventually considered as a chance of significant reflection on different aspects (such as competence development, institutional relationships, policies for training and labour market) that are reported here.

Competence development

The competence development topic has attracted a great deal of interest in the group. Even if interviewees adopted different meanings of competence/competencies (such as

[5] Participants of the focus group. *For the SW sector:* Patrizia Meloni (training manager at CIOFS-FS Italian Salesian Center for Female Work and Vocational Training); Roberto Sorrenti (head of TLC/Placement courses at "ELIS Center"); Maurizio Tolo (training manager at "Luigi Petroselli" VET Centre). *For the AV sector:* Mirna Lavigna (training manager at "New University of Cinema and Television"); Paola Marotti (training manager at "Digital Desk"); Antonio Parisi (director of "Rosebud Academy" for cinema and TV); Giovanni Persia (training manager at the "R. Rossellini" school for cinema and TV).

[6] Krueger R.A., *Focus Group. A Practical Guide for Applied Research*, Thousand Oaks, Sage Publications, 1994

technical abilities, *practical capabilities*, *professional knowledge*), the theme represents by far the most important issue that confronts participants. In both sectors most of the courses are dedicated to the development of practical technical competencies even if the theoretical side is completely disregarded within all the different training programmes. In parallel, the social 'transversal' skills are perceived as increasingly relevant matters to be dealt with. Crucial social competencies are considered not only those concerning intra-organisational learning and relationships but also those allowing positive interaction with customers and with professionals in the sectors (especially within professional networks).

One of the participants catalysed such a generalised attention to transversal competencies presenting a multitask methodology ("Competence Shop") in use within his training organisation. It includes several different tools (*role playing*, simulation, organisational theatre, etc.) aimed at developing participants' competencies in areas such as communication, *problem solving*, self-efficacy and teamwork.

Representatives of VET institutions within the AV sector claimed that they are trying to reinforce the collaborative side of work in the sector: programmes for different technical profiles are aimed at developing teamwork attitudes [probably in order to contrast the individualistic tendencies highlighted by life stories in AV] fostering the production of collective products (like short films and video clips) from the very beginning of courses. Such products also contribute to the enrichment of curricula and can be considered significant "identification cards in the world of work", as one of the participants said.

"Self-learning abilities" are also increasingly promoted. In both sectors *self-learning* is an intrinsic component of work situations characterised by non permanent employment relationships, project-based rather than open-end contracts, etc., i.e. situations which stimulate autonomous knowledge accumulation and sense of responsibility for your own professional future. In the software sector, given the high rate of technological innovation and the constant risk of obsolescence of any kind of professional competence, it seems necessary to instil a generalised awareness in participants of VET courses concerning continuous competence updating. On the other side the need for updating stimulates VET institutions to renew continuously their own packages through new forms of training needs analysis implying close connections with companies and experts in the field. In the AV sector too, the self-learning imperative is perceived in relation to changes entailed by the passage to digital technologies. Private VET institutions – also represented in the focus group – are now prospering through the provision of new kinds of training packages that also include participation in hi-tech courses within parent institutions abroad, in particular in the US. Such world-class preparation allows the lucky "happy few" who can afford such courses not only to meet interesting work chances but also, in some cases, to become teachers specialised in the diffusion of new technological expertise in the same training institutions.

Beside technological exigencies, competence development is seen in both sector as related not only to specific roles and work tasks but to something that is very close to "work process knowledge". Training design strategies attribute specific spaces to teamwork and role rotation. An interesting case has been quoted concerning the film editor profile. It

requires specific expertise but, in order to acquire real value on the labour market, it also requires detailed knowledge of other phases of the production process (in particular film direction and photography).

Institutional relations

VET centres admit the existence of difficult relationships with regional institutions in charge of financing, planning and ancillary services handling. In particular, the lack of specialised *guidance* facilities is considered critical from the viewpoint of both training organisations and training users. "Often people come to our courses barely knowing what they are going to learn…", claims one of the participants, "…consequently we must activate ourselves to fill in these gaps". Basic educational contents are equally considered not aligned with needed requirements. University background in particular – given that many participants in VET courses in the two sectors already hold a degree – is considered theoretically insufficient and inadequate for further professional enrichment through VET and/or professional practice.

VET in the AV sector is generally deemed insufficiently supported and financed, despite the activity of many regional institutions for the film and audio-visual industry development. As far as VET activities for the SW sector are concerned, regional government and policy institutions are deemed not contributing effectively because of their bureaucratic structures and attitudes.

Concerning companies' role in competence development the difference is emphasised from the VET viewpoint between micro-organisations, in which self-learning is a largely diffused practice, and larger firms, where the HR departments mediate firms' and individuals' exigencies. In the latter cases a further distinction has been made between firms which take the risk of developing competencies through training (losing working time and risking losses of resources as a consequence of turn-over) and firms who are afraid of such risks and are closed to, even innovative, training supply from VET centres.

Development perspectives and suggestions for training and competence policies

The growth perspectives of both sectors appear significant to all participants. In the AV sector new impulses seem to be brought about by new cost-effective production processes and by the rationalisation which is occurring in the industries of cinema, TV and radio as a whole. In the SW sector, after the burst of the speculative bubble on a global level, new development chances offered by the Internet are increasingly appearing for companies at different levels, including SMEs using high level resources. In both sectors, according to the opinion of the majority of interviewees, increasingly higher degrees of technical specialisation and commercial abilities are required in order to keep or expand the market share or a position in the supply chain. Participants in VET activities can profit from such situations. Success stories have briefly been told, for instance, about young people who were able to catch the e-commerce trend through specialised micro-companies or who got interesting Internet-related jobs within large companies.

However, participants of the focus group confirmed the high degree of polarisation of the labour market resulting from different inquiries carried out within the PARTICIPA project. From one side those who are unable to initiate a virtuous loop in competence development are also increasingly at risk of job loss and/or of unsatisfactory low-level professional trajectories. On the other side those who had good initial education and VET chances are also able to renew constantly their competence portfolio through work experiences in dynamic environments and a range of opportunities in self-learning and formal continuous training.

The interviewees have been asked within the focus group to suggest possible training policies concerning both categories, but with special attention to remedial training policies for more disadvantaged employees. Such remedial policies are considered difficult but not impossible. A fundamental obstacle in this regard seems to be represented by the institutional support to the efforts of VET organisations. Such a support considered slow and affected by bureaucratic hindrances, incompatible with the pace of innovation pace in hi-tech areas. Courses financed through public/FSE procedures have too long a time-to-customer, from the design, to the approval and financing to the delivery. "Courses in this field should be provided on a short-term basis, in order to help people to rapidly shift from their positions to other more satisfactory ones. But the risk, due to the bureaucratic problems, is at present the one of supplying obsolete competencies" said a trainer in the SW sector. This is why in the AV sector most of the training activities are provided on a private basis (at high prices) while publicly financed courses are rarely attempted.

Moreover, more viable ways of designing and providing courses could help VET organisations, as a participant claimed, "in creating closer connections between those who produce training and those who put it into practice, i.e. between VET organisations and companies". Most of the interviewees seemed convinced that the collaboration between the world of training and the world of work, and between public and private as well, is the winning card for future competence development policies in both sectors for employees at different levels of qualifications. The world of training, from this viewpoint, should be more able than it is at present to better understand market dynamics in order to provide really updated training products. "Training needs analysis" underlined one of the participants, "should be carried out together with the companies, not through useless statistical data". *Co-designing* appears as an interesting perspective, while the "linear procedure" (from training need identification to course delivery and evaluation) is deemed to be obsolete. In one of the training centres represented in the focus group, for example, a consortium of companies and training organisations has been already established for such co-designing purposes. General consensus has been expressed to the proposal of better exploiting the channels already open between companies and training centres concerning internship and apprenticeship activities.

Of course, these policies are in some way embedded in the AV sector structure and functioning: links with producing companies are facilitated by personal relationships of the training staff ("the world of show business is made up of right encounters and trusted relationships"). On the other side, in the SW sector, links with companies take place in much more organised ways.

Overall Research Conclusions

Project activities

These conclusions regard the whole set of project activities concerning employees of SMEs operating in two service sectors: (i) software (within the broader ICT sector); and (ii) audio-visual production (within the broader Radio and Television sector). The project activities have been mainly focused on the attitudes and behaviours of technical employees in both sectors regarding their participation in training activities and their trajectories in terms of work-based learning and competence development. In particular the results of a specific questionnaire-based inquiry were presented in Report 2, while the results of specific life histories analysis have been dealt with in this Report (Report 3). Other relevant aspects of the project activities have been:

– the general characteristics of CVET in Italy. A specific overview has been provided in Report 1, including aspects such as legal regulations, institutional structures, policy orientations as well as data on attendance of CVET according official sources and special inquiries;
– the structural patterns and economic dynamics of the two sectors. In Report 2. and in this Report (3) sectoral trends and firms strategies have been explored as emerging from statistical data and from ad hoc interviews with responsible persons in enterprises. Such aspects have been assumed as 'situational factors' affecting technical employees' participation in training activities, work-based learning and competence development. A case study, carried out in a small dynamic software-house (presented in this Report 3) contributed to a better understanding of the issue;
– the viewpoint of CVET practitioners, as emerged through a specific focus group (presented in this Report 3) carried out as final research activity.

As a whole such a multilevel inquiry shows that the participation of technical employees in the two sectors in formal CVET activities is low, confirming both the weak position of Italian CVET system in trans-national comparative data and the results of special inquiries carried out in this country in order to assess social attitudes and experiences regarding CVET. Especially in SMEs' contexts the demand of CVET services seems particularly low, while, at the same time, the supply of them is quantitatively lacking and insufficiently targeted.

However, the outcomes concerning formal CVET have to be contextualised within a more complex picture of the interrelationships between training factors on the one side and work, organisation, learning and competence factors on the other side. In such a picture CVET is not marginal, considering in particular that some kinds of VET/CVET interventions (especially within the SW sector) are very effective in terms of participants' employability. But at the same time the analysis confirms that in innovative and fast developing sectors work-based learning is the main form of knowledge reproduction and acquisition, and is much more significant than traditional forms of VET/CVET. As a consequence, a generalised need for new forms of CVET emerges in both sectors, requiring new CVET policies at the European, national and regional/sub-regional level.

The situational factors

Innovative services in the Rome area show relevant traits of dynamism but at the same time the overall structure of them is highly fragmented and polarised. In quantitative terms, Rome hosts 9% of Italian enterprises in ICT and 14.5% in radio and television; ICT enterprises located in Rome employ 14% of all the workers of the sector at national level. The Radio & Television sector – including the 'giant' RAI officially accounts for 54.3% of the national workforce: the latter is of course a 'statistical distortion' but it witnesses the extent to which the audio-visual sector is central in the local economy. However, three quarters of the companies in both sectors are in fact one-person companies and that the most of the employment is nested within micro dimensional organisations.

Concerning the SW sector a significant stratum of SMEs can be identified, whose main clients are large companies and public administrations and in which inter-firm competition is mostly based on technological innovation, product quality and customer satisfaction. A severe organisational rationalisation is taking place within such SMEs, which can be considered as affecting the successful survivors of a deep crisis that in 2000-2001 followed the burst of a service and financial 'bubble' previously created by the proliferation of small companies in ICTs. At the opposite side of the SW sector, within a rather polarised industrial structure, a number of smaller businesses still exist – the unsuccessful survivors – continuously at risk, oriented towards low quality products, mostly competing on prices. These processes favoured the emergence of updated types of professionals in the upper stratum, not only technically competent but also holding significant social skills. On the contrary, in the lower stratum employment is largely precarious and excludes any real developmental trajectories.

Concerning the audio-visual sector, the fragmentation phenomena are linked to structural factors: most of the activities are carried out by micro-enterprises sub-contracting with RAI and, to a lesser extent, with Cinecittà (the well-known Roman cinema studios). A relevant section of the sector has developed over time some characteristics of an 'industrial district': it can be seen as an interconnected filiére composed of specialised suppliers operating on a static market but exposed to radical transformation linked to the use of new digital technologies and to the increasing interconnection of cinema, TV and advertising. Even in this sector the production and employment structure is polarised: on one side there are the employees of SMEs which were able to follow the new paths of technological innovation offering products of increasingly high quality and significantly in line with customers' needs; on the other side there are several low-level jobs in micro and small companies which are detached from innovative dynamics (like several radio stations) and close to disappearance.

Work inclusion processes

Considering people's attitudes and behaviours in the two sectors, the principal analysis outcomes – those stemming from the questionnaire-based inquiry and the collection of life histories – show that access to work and career development are largely of a pragmatic

and informal nature. Getting a job in these sectors is largely dependent on the functioning of informal social networks, in a way that important research has been underlining since the Seventies (Granovetter, 1973). The "strength of weak ties" is demonstrated by the experiences of a number of interviewees who entered their present careers not through the classical education-training-placement-job sequential steps, but through more variegated processes of inclusion through the help of relatives, friends or even through spontaneous relationships embedded in social environments.

In parallel, the nature of what is considered as a 'job' is highly variegated: different typologies of work are in place within an overall situation in which any uniformity has been overcome a long time ago, or perhaps never even existed. However, some regularities can be found in the two sectors as well as differences between them. In the SW sector – where the organisational innovation rate is high but companies tend to a certain degree of stability – inclusion in work processes takes the form of permanent and non-permanent work contracts in an almost equivalent proportion. In AV non-permanent work contracts (of the free-lance type) prevail due to the characteristics of production processes that take place in stable organisations as well as in more 'ephemeral' organisations, activated in relation to specific production projects and disbanded at the end of the projects themselves.

Very interesting evidence regarding inclusion processes have been provided by several life histories in the SW sector showing that work inclusion is due to the acquisition of competencies through VET courses. This is the case of people that, at an age around 28, accessed VET courses in informatics as an alternative path in relation to previous education and life choices that had brought some of them to getting a degree in social science or humanities and to later understanding the low value of these on the labour market, or even to discovering new personal interests and bents. The influence of social networks seems relevant in the choice of VET courses and afterwards in job finding. At the same time the research outcomes demonstrate that VET can be the trigger of a significant turn-around in chances in work and life and that the distinction between 'initial' and 'continuous' is highly questionable for training activities that are addressed to adults who already had work experience and want to re-start their own professional development.

It is worth mentioning that VET courses are much more offered in the SW sector than in the AV one, where, as life histories demonstrate, clearer initial professional 'vocations' are manifest and informal apprenticeship are the rule. In some cases traditional VET or CVET is replaced by very dynamic forms of training offered by private suppliers, especially equipped for satisfying specialised needs in the technological knowledge field.

Learning and competence development within working environments

After the phase of inclusion, keeping the job and progressing in work experience in both sectors are mostly assured by spontaneous forms of learning in which informal work-based learning and self-managed competence development converge. Work-based learning and competence development appear as crucial aspects, which largely

compensate – for better or worse – for the lack of wide-scale formal CVET interventions. The importance of these aspects has been underlined by both witnesses on the enterprise side (managers and entrepreneurs interviewed in the first activity phases) and interviewed employees. The latter appeared aware that technical competencies represent crucial tools for survival and development in their own working life. Effective and up-dated competencies are deemed to be fundamental not only for the functioning of companies as such but also, in individual terms, for self-valorisation and visibility on the labour market. Continuous technical competence development is considered as a crucial issue for personal achievement and for the growth of new forms of organisational relations based upon mutual consideration and trust.

Moreover, a real competence development is assumed – by the majority of interviewees – to be linked to the acquisition not only of specialised knowledge concerning technical aspects of the work processes but also to relational aspects. These are deemed to be connected to forms of work in which contextual inputs are continuously scrutinised, the interplay between different roles and activities takes place outside bureaucratic schemes, the ability of effectively interacting with external subjects like clients, providers, competitors is highly needed and valued.

Especially within dynamic contexts – as has been particularly confirmed through the case study – professionals' competence development paths in small organisations are oriented towards the acquisition of what recent literature labelled as *work process knowledge* (Boreham, 2002; Boreham, 2004; Boreham, forthcoming), i.e. knowledge of the business production and labour processes in the organisation which is created and circulated through co-operative arrangements at different levels, allowing continuous learning and process improvements. The small organisational dimension and the dynamic work conditions in both sectors stimulate the continuous reproduction and innovation of such work process knowledge.

Within dynamic realities the work environment allows forms of continuous learning from others, i.e. learning from members of the work group and professional communities that every employee belongs to but also learning through opportunities of receiving older members' experience and of exchanging information and knowledge even drawn from outside the organisation (especially with clients and providers). The *communities of practice* model (Wenger, 1998; Wenger et al., 2002) provides elements which seems coherent with these realities, as it depicts ways of working and learning (based on collective sense-making, engagement in a common enterprise perspective, and mutual support within concrete work situations) that are typical of innovative SMEs. Learning is intrinsic in ways of working in which co-operation and competition between employees co-exists.

In parallel a significant continuity seems to occur between learning in the working environment and self-learning, especially as far as the up-dating of technical competencies is concerned. Both the questionnaire-based inquiry and the life histories interviews show that individual up-dating (through reading handbooks and specialised journals, navigating websites, and attending newsgroups) is widespread among technicians in the two sectors

and is considered as a necessary activity for surviving and developing in fast changing contexts.

Where conditions for learning from others and self-learning are weak or lacking – like in less successful organisations in the SW sector – these opportunities proportionally decline. One important research outcome is that the structural polarisation of companies in both sectors, especially in SW, has a very clear correlation to the polarisation of work conditions and learning opportunities. Regarding this phenomenon the employment reality can be visualised along an axis at the extremes of which two opposite situations can be identified. On the upper side there are professional strata that can be considered as the "haves", placed in organisations that in some ways are "learning organisations" where competence development is intrinsic in the functioning of work relations and supports the emergence of acknowledged professional identities. On the lower side one can identify the "have-nots" operating within low quality work environments, at risk not only in terms of job security but also exposed to more or less radical isolation from competence development and from possibilities of self-enhancement through self-learning. Several negative loops are in place within stagnant or regressive organisations where the lack of professional growth perspectives represents a depressing factor for spontaneous learning, inhibiting the formation of professional identities within the organisation and at the same time informal work-based learning and self-managed competence development.

In-company training

Some forms of training result to be developed within enterprises, in particular in the SW sector, although the majority of enterprises tend to avoid to distracting' their personnel, even for a short time, from working activities. Within the SW sector internal training is typical of more planning-oriented companies which can provide formally structured courses while the great majority of SMEs tend to put in place only short interventions in terms of on-the-job learning. Structured courses usually involve employees having an experience of a medium to high duration and are mainly aimed at developing their technical competencies. Sometimes they take place outside firm premises, more frequently inside. Quite often they are held after working hours. Such courses are highly appreciated by employees not only for their intrinsic contents and the opportunities they offer to complement informal work-based learning with given quanta of explicit knowledge but also for their symbolic value, as a sign of interest from the firm for competence development of its employees. At the same time the frequent low quality of teachers and the unfriendly modalities (too much beyond working hours) are considered as points of weakness of such initiatives.

It must be noted that non-technical training is very rare, while it might be very useful in order to accompany informal learning. Within the AV sector internal training does not exist, except within forms that can be classified as apprenticeship (for newcomers) and coaching (within team management practices). Structured continuing training opportunities are mostly offered by technology providers, while very specialised and high-cost courses for handling new sophisticated technologies are offered by small training businesses which in many ways can be considered as CVET and are significantly

appreciated as they can assure remarkable returns to individuals who afforded specific investments on them.

Needs for new forms of CVET

The above depicted situation is typical of new forms of labour market in which the traditional dynamics of work demand/supply are replaced – although not completely – by knowledge demand/supply dynamics (Burton-Jones, 1999). Research activities carried out within the PARTICIPA project show that such dynamics are far from being represented by a pure 'free-trade' model. In particular, SW companies operate a logic of protection of their internal *intellectual capital* and put in practice policies that – although not in a conscious way – have something to do with the idea of *core competencies* development, whereby internal resources assuring competitive advantage have to be continuously monitored and rewarded (Pralahad and Hamel, 1990). The high mobility which is typical of the SW sector is not totally at odds with firm policies aimed at promoting 'internal labour markets' allowing more or less extended opportunities for informal work-based learning and individual competence development. Even in the AV sector where the work relations are highly individualised, as the free-lance model of work supply is largely diffused, important mechanisms are in place for preserving competence recognition, professional identity and trust.

As already underlined, such a model of organisational functioning and HR management assures high levels of work flexibility and constitutes some basic conditions for integrating individual experiences within broader-scope organisational learning. In parallel, other research outcomes highlight the weakness of such a 'spontaneous' model and some risks implicit in its reproduction. For enterprises, such points of weakness – as shown by the case study – can emerge in phases of firm consolidation and expansion in which leaving competence development to the responsibility of individuals may be an inappropriate strategy and in which, on the contrary, more structured models of HR management should be developed in order to accomplish longer term objectives. The accumulation of 'skilful incompetence' (Argyris, 1990) effects might be expected in an organisation that does not develop explicit plans for professional growth.

For individuals, 'spontaneous' learning from others and self-learning can represent powerful boosts for the acquisition of some degrees of work process knowledge, but both these ways of informal learning cannot be considered as the only ways of competence development. First of all a positive development of informal learning requires that parallel opportunities be put in place for deepening the technical-scientific underpinnings of work activities. "…I feel the need to go back to study. At a certain moment one needs to link experience and informal learning with something more structured…", affirmed one of the interviewees, clearly expressing a way of thinking which is present in many other life histories.

Moreover, work-based learning of individuals and groups requires higher levels of aware management in order to produce sustainable outcomes, but at present such awareness seems to be rare. Informal learning processes are felt to be crucial by employees but at the

same time are not consciously handled or even conceptualised while deeply rooted mental models concerning work, organisation, knowledge acquisition and other important issues still survive. Many of the interviewees tend to consider the acquisition of work process knowledge as just self-generating through experience. Only a few realise that real learning has to overcome serious constraints in terms of time and action and requires the use of reflective skills concerning work activities (Schoen, 1986). "Stopping to reflect with other people on what we are doing is a luxury we can hardly ever afford. It would be important to understand things when we are doing them…", stated one of the interviewees, providing an important view on a problem which is at the same time of a cultural and a organisational-managerial nature.

Innovative forms of CVET, significantly far from the traditional school-based model, could play an important role in relation to the above problems. Such a new role should be based on education-training strategies referenced to the emerging characteristics of organisational knowledge and learning development. This seems to imply new choices at different levels regarding in particular: the overall strategic approach and even the fundamental meaning of CVET in socio-economic processes, the link of CVET policies with other development policies at the sectoral and territorial level, and the creation of new intervention frameworks adapted to the reality of adults employed in very different contexts.

In terms of an overall strategic approach CVET should acquire a wide-scope viewpoint on the nature of knowledge and competencies, especially in rapidly changing technology-based processes. Knowledge needed within such processes cannot be treated anymore only in terms of *know-what* (information about the explicit aspects of work activities) as is typical of the great majority of initiatives (courses) in this field. Dealing with such processes also requires continuously accrued competencies in terms of *know-how* (based on awareness of the effects of the tacit cognitive components of work activities), *know-why* (i.e. continuously updated understanding of the scientific principles underpinning technologies and other aspects of work activities), and *know-who* (regarding the social side of work activities) (Lundvall, 1992, Lundvall and Borras, 1999). This implies a new conception of CVET interventions, in which informal learning and the different modes of conversion of explicit knowledge into tacit knowledge and vice versa could also be taken into account (Nonaka, 1994; Tomassini 2003)

In terms of development policies, those devoted to CVET should be connected with other relevant policies aimed at promoting the overall growth of the industrial/service fabric of specific sectors and regions forms. This means promoting and sustaining through appropriate interventions the management of SMEs, in particular for the support of entrepreneurial competencies, considering that entrepreneurs having a technical background often lack the abilities and visions needed for carrying out complex problems at the organisational and HR level.

As far as the creation of new intervention frameworks is concerned, these should be adapted to the reality of adults employed in very different contexts. In general, two different macro-frameworks should be conceived. The first one should regard the

employees operating in the lower side of the employment reality of sectors like SW. The main aim of the interventions at this level should be the one of helping people in overcoming their present situation, that is, in acquiring new skills which could allow them to leave their unsatisfactory and precarious jobs and to self-design a new professional future in the same sector or even outside it. The second one should take into account the more or less consciously expressed needs of professionals who are engaged in situations where competence development is linked to concrete opportunities to participate in the creation and exchange of work process knowledge and where the combination of work-based learning and autonomous self-learning ensure sound bases for further progresses. The main aim of the interventions in these cases should be the support of two relevant exigencies:

– deepening the contents of self-learning through updating activities based on recent disciplinary and quasi-disciplinary advances;
– increasing the employees' reflective abilities through the familiarisation with appropriate methodologies ('action methodologies', 'reflective practices') to be applied at both the individual and the organisational level.

In both cases the traditional concept of CVET is significantly challenged. Operating within the above sketched framework implies the need for CVET systems to overcome the bureaucratic forms through which CVET courses are at present delivered. Such forms – as emerged in the focus group – are considered as dysfunctional even by direct actors (VET practitioners and managers of training institutions). In particular, the "ESF co-financed course" which still plays a not at all negligible function for those who are seeking for new professional prospects, can be considered an out-dated instrument from the viewpoint of real 'continuous' improvement needs. In sectors like those considered in the present inquiry new forms of participation in CVET activities will emerge if new policies are put in place in terms not only of education and training but also of organisational and professional counselling for companies and for individuals. A deeper engagement seems indispensable of the involved research communities on these kinds of topics, together with increased levels of co-operation between different institutional subjects in particular within the regional and sub-regional dimension.

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Portugal

Eduardo Figueira[1] & Marta Alves[2]

Participation in Continuing Vocational and Training. A Portuguese Case Study

Introduction

Adult Education and Continuing Vocational Education and Training (CVET) in Portugal still carry 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 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 for adults to acquire new qualifications through validation and certification of competencies acquired via life experience. 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.

The present study aimed to analyse factors associated with participation in continuing training activities of employed technicians in different productive sectors of six European regions. More specifically, the study intended to understand how factors associated with participation in continuing vocational education & training (CVET) activities influence employed technicians' decision to participate in those activities in those regions and evaluate the differences between the factors operating in different regions. Understanding adult participation in continuing qualification activities will give a relevant contribution not only to promoting participation of non-participants but also for designing and setting up effective CVET programmes.

The initial research results obtained from the survey applied to the Portuguese agro-food and ICT small companies have indicated that, in general, the ISSTAL model appears to be a useful theoretical framework for understanding how and why technical workers from the agro-food and ICT sectors participate (or not) in continuing training offerings.

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[1] Senior Researcher, ACADEMUS, & Associate Professor, Depart. of Sociology, Univ. of Évora, Portugal

[2] Consultant, ACADEMUS

Nevertheless, findings have also suggested that the theoretical model needs some minor adjustments in order to better explain technicians' participation in CVET. In addition, survey findings have also shown that technician's participation in CVET is more influenced by factors linked to individuals as, for example, *images of learning, experience, and attitudinal dispositions* than by factors related to situations.

Active adults' participation in continuing vocational education and training (CVET): a theoretical framework

Continuing Vocational Education and Training (CVET) can be seen as subsequent training actions, throughout active life, following initial education. It aims to improve people's skills and competencies, widening knowledge of individuals or promoting their specialisation at a specific level. In this way, CVET facilitates adults to adapt to organisational, technical, and technological transformations of the present days. For this reason, 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 in facing the present "*challenge of competitiveness*" (Barrosa, 1991).

In some Portuguese regions 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.

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 continuing qualification of professionals. This is true because understanding how and why (and why not) adults participate in education activities facilitates the setting up and implementation of effective strategies to promote continuing education programmes to satisfy training needs of individuals and organisations.

Factors associated with adults' participation in continuing education activities are diverse in nature. According to previous research results, adult participation in education is influenced by characteristics of a personal order and contextual nature. The personal factors are usually associated to an individual's experience in social and educational processes. Furthermore, an individual's level of formal education appeared to be very positively associated with their participation in continuing education. The contextual factors are related to characteristics of the environment and conditions of the training offerings. The location of the training activities and the need to learn may also pose obstacles to an individual's participation in training activities.

Although participation in continuing education has been very much studied, few conceptual models have been useful for predicting participation of adults in training

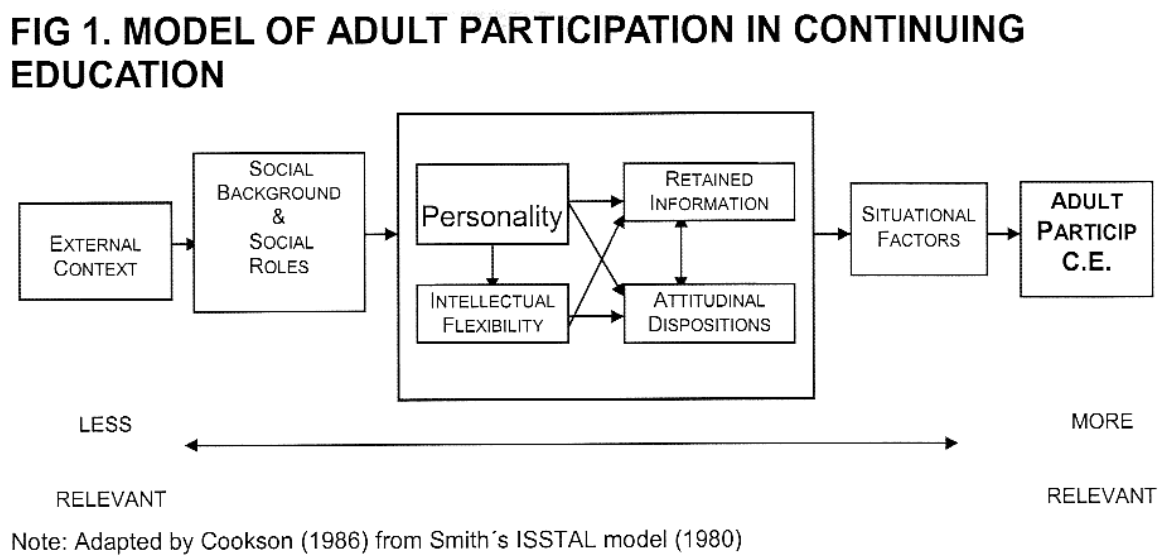
activities (Yang, Blunt, & Butler, 1994). Many researchers have framed their participation studies according to Fishbein and Ajzen's (1975) behavioural intention model. Others have tried to link motivation with participation in training activities and some other researchers have based their studies on social psychology theory (Cross, 1981; Darkenwald and Merriam, 1982). Research carried out more recently has posed new questions and have opened other research perspectives for studying adult participation in training activities. For example, factors related to the marketing of continuing education offerings, social context of individuals, and difficulties of personal and professional order, in addition to individual motivation, appear to influence decisions of adults for taking training (van Tilbourg, 1989).

Adults' participation in training activities have been, more systematically, studied by Peter Cookson (USA) in a frame of the ISSTAL (***I****nterdisciplinary,* ***S****equential-****S****pecificity,* ***T****ime-Allocation,* ***L****ifespan*) 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, 1986): (1) External context, (2) social background, (3) personality, (4) attitudinal dispositions, (5) retained information, and (6) situational aspects (Fig 1).

The **External context** is related to characteristics of the local where continuing education is taking place. 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. 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** includes factors of psychological functioning, personality characteristics, and intellectual capacities of individuals. 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** frame factors concerning individual's values, attitudes, expectations and intentions. 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** includes variables related to individuals' learning orientation, beliefs, and knowledge they have about learning. 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. The ***situational factors*** are related to temporary situations and aspects that may be associated to participation in learning activities. 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. In the present research, **adult participation in continuing education,** the criterion variable, was defined as the technical workers' involvement in purposive and deliberate learning through continuing education and training programmes.

Figure 1 Model of adult participation in continuing education



Besides aggregating all the variables previously described, this model includes three fundamental aspects:

- *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;
- *Sequential Specificity of Relations*, the six classes of independent variables 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

– *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 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.

Study Objectives

This research is a part of a larger study that aimed to study and understand one of the most important key mechanisms for the social integration: technical workers' participation in continuing vocational education and training in six European regions. The relevance of the study is based on the assumption that knowing and understanding the factors which influence technical workers' participation in CVET will allow the development and implementation of effective strategies for increasing technical workers' employability which is relevant to combating social exclusion.

Knowledge about conditions and factors that influences adult participation in learning activities must be improved in Alentejo, Lisboa & Vale do Tejo regions if effective continuing education policies are to be developed in those regions. On the one hand, participation in continuing qualification of active adults contributes to preventing an individual's social exclusion through increasing an individual's employability. On the other hand, promoting participation in continuing training of unemployed people, namely those who are less qualified, facilitates combating exclusion of the less favoured.

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 chosen regions. 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 intended to assess technical workers' attitudes towards participation in continuing vocational training activities, with special reference to the domain of new information technologies. In consequence, the study aimed to contribute to 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 reach the following objectives:

– To identify and analyse factors and relationships associated with 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 towards 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 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 embark on continuing VET in the chosen regions.

Study Context: The studied productive sectors

The Agro-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 90s. 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. With the opening of the markets to international trade, associated with the growing dynamism of the market, the increase in the demand for products with greater added value, the change in the life styles favouring the convenience of the products, the Portuguese market has become increasingly attractive for foreign food-processing companies, through the direct placement of their products or the installation of these companies in Portugal (INOFOR, 2001)

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 one of the main sectors in terms of employment within the national transformation industrial sector, being surpassed only by the clothing industry. This situation has occurred as a consequence of market changes due to change in consumers' habits and other changes such as the increase of the number of women working out of 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 our survival.

Alentejo is among the 25 poorest regions of the European Union, in terms of GDP *per capita*. Among the five NUTs of the Portuguese continental territory, 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 from 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. Despite the strategic importance the sector still has, above all, when one takes into account the combined value of agriculture, forestry, food-processing and wood industries, the relative loss of its autonomy and social and economic importance is a fact, and the downstream displacement of the centre of gravity of the value chains of agricultural and forestry products is well evident (a 15.1% contribution to regional GAV, representing only 3.9% of the total contribution of the agricultural sector to the national GAV). In addition, the operating rules resulting from the inclusion of the sector in a context of open markets, and to the progressive liberalisation of policies and the impact of changes in technology and consumption patterns, have brought about fast changes in the competitive framework and in the need for adjustment in food-processing activities.

In this context, the recognition of the multifunctional character of agriculture, the changes that are introduced into it through the dominant dynamics, mainly through the production of "traditional products" with "Protected Geographic Indication" in the frame of the "CEE Regulation 2081/92", 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 Interviewed Company

The company interviewed is a small company that produces tomato paste and other agro-food products made from tomatoes. The company employs 50 people from whom 6 are technically qualified and higher educated workers who play a key role in the production process, mainly in terms of framing and helping the other less qualified workers. In addition to those 6 technical people, there are 8 others who perform a technical role since they are specialised in working with some machines. However, these last 8 people do not have a higher education degree. They learn about their activity through training and experience. In the administrative functions, including personnel management, finance and other related activities, the company has 5 workers who have the secondary education and were qualified for their functions through training and experience. The 31 remaining workers are considered undifferentiated people in qualification terms. In general, they

own a basic education certificate and their activities do not require a technical qualification. However, at least two of the specialised machine operators were recruited from people who were, at the time, considered undifferentiated. They have learned how to operate with machines from colleagues in the company. The average age of the workers is around 46.9 years. However, both the technical and the undifferentiated employees are older than the people who perform administrative functions who have an average age of 35 years.

Although training actions have been developed and implemented in the company, mainly in subjects related to operations with specific machines, the company does not have a training structure. Most of those training actions that have been given in the shop floor concern the operation of the machines. For this training, the trainers are either more experienced workers or technical people from companies that have furnished the equipment. The responsibility for the training function in the company belongs to the top manager. However, due to the lack of time, the top manger has delegated the training function to the personnel manager. All the other needed training is bought outside of the company from specialised consulting companies. For instance, this year, some people have been attending training on quality and certification concerning the ISO standards.

The Information and Communication Technologies (ICT) sector in Lisboa & Vale do Tejo [3]

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.

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

[3] 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.

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 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 the 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. 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 may be presented as follows:

Tab. 2 ICT market segmentation by products

	EITO	IDC	INSAT[4]	MENTOR IT
HARDWARE	•COMPUTER AND DATA COMMUNICATION HARDWARE •OFFICE EQUIPMENT	•DATA COMMUNICATION • INDIVIDUAL USERS • MULTI-PURPOSE	• SERVERS • PCS •OTHER HARDWARE	
SOFTWARE	• SOFTWARE	•SOFTWARE PACKAGES	•SOFTWARE AND SERVICES	• SYSTEMS SOFTWARE •APPLICATION SOFTWARE
SERVICES	• SERVICES • SUPPORT SERVICES	• SUPPORT SERVICES •PROFESSIONAL SERVICES		• CONSULTANCY •IMPLEMENTATION •OPERATIONS MANAGEMENT • SUPPORT 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.

Regarding to the *Consultancy (Strategy & Architecture)* sector, all activities are, in general, connected with the respective industry. Concerning *Operations and Implementation Management* segment, activities are directly involved with the creation of IT solutions. Operations management presupposes, therefore, responsibility for the management of the components of a specific client's IT infrastructure. The *Training* segment constitutes a vitally important business sector in any IT strategy since, without suitable training,

[4] The INSAT does not separate software from services.

investment in IT will not produce good results. *Support Services* can be integrated within a vast range of services or, alternatively, may be commercialised individually. The *e-business Services* is divided into two sub-groups: Business-to-Business and Business-to-Consumer. 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.

The Interviewed Company

The company interviewed is a micro consulting company that offers consulting computing services to other companies. The company employs 10 people, from whom 2 possess a university degree, 4 attended higher education in computing sciences, 3 possess a vocational school certificate on computing related subjects and the last one has a secondary education certificate on administration subjects. From the 9 technically qualified in computing related matters, two play a key role in strategic planning, innovation and technical support to the other employees. The 7 remaining employees are first-line workers who have the responsibility to deliver the specialized computing services to other companies.

The company was created in the year 2000 and the average age of the workers is around 30 years. Given the size, the company does not have a training structure. The responsibility for the training function in the company belongs to the top manager who also performs the HRM (human resource management) function. All the needed training is bought outside of the company from specialised consulting companies. However, the collaborating learning among the employees and e-learning has lately been getting more important in the company. For instance, this year, most of the employees have enrolled themselves in e-learning offerings and have also attended short courses and seminars in very specialized matters. It appears that a learning culture exists in the company since all the workers are conscious of the importance of developing their competences not only for the success of the company but also for their own individual success and for their continuing employability.

Case study methodology

Conducting a case study has constituted the sixth phase of the PARTICIPA study. In this phase, data was collected by semi-structured interviews and non-participant observation from one case (a company) chosen according to specific criteria established after the survey phase. The case study has essentially aimed at deepening results from the previous phases in order to better understand the phenomenon of technical workers' participation in continuing VET activities. Taking into consideration the need to cross information from the agro-food with IT sectors, the Portuguese 'case' was constructed with responses from two micro companies, one for each sector.

a) Criteria for choosing a case study

The case was chosen taken into consideration the following criteria:

– The case study was constructed with responses from two companies participating in

CVET activities one from the agro-food sector and other carrying out ICT activities.
– The companies were chosen because they have demonstrated that they pursue "good" practices for improving people's engagement in training or learning related to competence development and meeting business needs.
– The two chosen companies have a significant proportion of full-time technical workers.

b) Development of the case study

The case study was developed taking into consideration the following guidelines:

– The case study was developed around factors that may influence technical workers' participation in CVET.
– The considered participation factors have closely followed the major dimensions of the ISSTAL model.
– The case study has been built on results from survey and focus groups phases in order to highlight significance of the previous results.
– The case study has included a description of the company's training and support for learning policies and strategies for technical workers.

c) Dimensions considered

The case study has looked at the ISSTAL dimensions and aspects of the company CVET policy and practice and technical worker behaviour, namely:

– CVET policies and strategies;
– Incentives and support for workers´ training;
– Workers' social background and roles;
– Workers' attitudes toward CVET, learning, & development of competences;
– Employees' personality & intellectual flexibility;
– Employees´ learning experiences;
– Situational aspects that favour or constitute barriers to workers' participation in CVET;
– Quantification of workers' participation in CVET (in the past year);
– Company's ICT strategies and practices.

d) Data collection

Data was mainly collected from semi-structured interviews conducted with managers and employees at different levels of the two companies. The interview guide was sufficiently flexible to allow including data not previewed. This data collection was complemented with non-participant observation and analysis of documents related to employees' training and learning. The two companies integrating the case study were a small agro-food (tomato paste production) company with 50 employees and a micro ICT company with 10 employees. Eleven interviews were conducted, seven in the tomato paste small company and four in the ICT micro-company, respectively. In the agro-food company interviewees were the manager, four technicians of the first line of production (specialized machine operators) and two supervisors (technicians). In the ICT company interviewees were the manager, two technicians of the first line of production and one supervisor.

Data collected was submitted to content analysis utilizing dimensions of the ISSTAL model as the referential frame.

Data analysis and discussion of results

Concerning CVET policies and strategies both managers and technicians from the two companies were unanimous in considering that continuous training and learning is essential to improve individual and company performance. In addition, both managers consider very important the investment into development not only of the technical competences but also of the transversal and interpersonal competences of their workers. However, a slight difference exists between the two managers concerning company training policy. The ICT company's manager gives more emphasis to employee's responsibility for their training and learning than the agro-food company's manager.

> *"Companies should invest in development of the transversal and interpersonal competences of their employees (…) and the workers should invest in development of their technical competence. (…) for instance, I intend to invest in training in the domains such as time management, attending to service and relationships with clients, and quality in service offerings. In addition, I want workers who wish to increase their knowledge about their activities and have the ambition to learn continuously (lifelong learners)."* (ICT company's manager)

> *"The company pays special attention to continuing training of technical staff since its survival depends essentially from its level of competitiveness and this depends directly from workers' competence. (…) The company is working in a very competitive productive sector and is subject to competition from Spain, Italy and even from China."* (Agro-food company's manager).

> *"Initial and continuing training are very important for a professional who aims to be successful and maintain his or her job or, eventually, get a better one."* (ICT company's worker).

> *"In the tomato industry one has to pay permanent attention to your competences and needs for further learning. (…) no one is able to maintain his job if he does not have a positive attitude to continuing training."* (Agro-food company's worker).

Neither the ICT nor the agro-food company make training needs analysis explicitly. In addition, the companies do not have a real training plan. However, both companies analyse the difficulties encountered by the workers in the development of their activities. In the ICT company, all the first-line workers meet together, once a month, with the two colleagues who play a supporting role for them. Sometimes the top manager attends those meetings. In those meetings (kind of brainstorming), difficulties encountered by the workers are analysed and discussed. If a difficulty has not been solved (or not well solved) and the group is not able to see the solution, it is registered in a list of difficulties. Later on, the two workers responsible for the innovation and strategic planning delineates a plan to solve the difficulties taking into consideration the level of the difficulty of each one of the reported "*difficulties*" and the priority for their solution. This plan is discussed with the top management. In the agro-food company, difficulties are also reported to supervisors but individually by each worker. The encountered difficulties are analysed by the supervisors with management and from this analysis a plan is made for solving the difficulties.

The top managers of the two companies have slightly different positions in relation to incentives and support for workers' training. This difference comes from the fact that the ICT company's manager considers that workers should be responsible for their competence development in technical subjects while the agro-food company's manager defends that the workers' training should constitute essentially a responsibility of the company. However, he also considers that workers have to pay attention to their own competence development.

> *"I am not sure if companies should support workers' training concerning their technical competence development (…) or if that responsibility should be up to the worker. (…) People who are more efficient and effective in their activity are usually those who take the initiative for their competence development. (…) In addition to the recognition by all colleagues, I reward those employees through salary increase and promotion."* (ICT company's manager).

> *"The company supports all the costs involved in workers' training since this training is recognized by the top management as needed and useful for the company's performance. In addition, people who attend training and show themselves to be more competent are usually promoted and go up faster in the career ladder than the others.* (The agro-food company's manager).

Workers of the two companies closely follow the perspective of their managers concerning incentives and support for workers' training.

> *(…) I feel I have to be the first responsible for my competence development. (…) I took the initiative for taking training in Microsoft (…) and I got the MCSE certification. This gave me the qualifications /competences and possibility to go up to the second degree of the technical career in the company."* (ICT company's worker).

However, one of the ICT company's employees considered that taking training, in the evening, after working time, is usually very difficult.

The context the two companies' managers face in relation to workers' social backgrounds and roles are very similar. Both of them consider that, in addition to the professional competence, social competences, way of being in life and even workers' social roles in the community are relevant characteristics for being a good worker.

> *"Although the technical competence is very much taken into consideration for taking on or promoting a person, I have been very much paying attention lately to individuals' social competences and roles and their key-competences namely the ones related to interpersonal relationship."* (The agro-food company's manager).

> *"In addition to the specific qualifications, I chose and support those who show they have a positive way of being in life and possess social competences."* (ICT company's manager).

Both companies' managers consider that their technical workers have a very positive attitude toward CVET, learning, & development of competences. In the ICT company, workers show ambition for learning new things related to their work and look for training or other modes of developing their competencies (for instance e-learning) by themselves. The same may be said for the agro-food company's workers. The difference is that ICT employees have to support training by themselves while agro-food employees' training is supported by the company (when considered relevant for the company). In addition,

technical employees of both companies identify and analyse their learning needs (difficulties in performing their tasks) and try to solve them.

> *"Technical workers have, in general, a very positive attitude towards training concerning technical matters related to their professional tasks. (…) Frequently, they propose to management to attend certain training courses they consider relevant for improving their performance in the tasks they are responsible for."* (The agro-food company's manager).

> *"I don't need to be concerned about my technical workers' competence development. They keep themselves very attentive towards their professional development. (…) If someone feels a learning need concerning his tasks, he looks for the way to satisfy the need."* (ICT company's manager).

In general, according to both managers, attitudes towards training and learning appear to be not very much different within or between the different groups of technical workers. This is to say that the technical workers' personality characteristics appear to not have a significant influence in their attitudes to continuing learning and training. As would be expected, workers with different personality characteristics exist in both companies. However, attitudes towards continuing training and learning are, in general, very much positive among all the technical workers. Technical workers also appear to have a relevant intellectual flexibility. In fact, concerning training, all the technical workers of both companies were much more concentrated on the training (learning) contents than in the mode or strategy used to take it or to develop the corresponding competence. Their main concern was centred on developing their professional competences. However, all of the interviewed technical workers have indicated their preference to take training outside of the company in recognized specialized competent training entities.

> *"Concern about strategies and modes of training (and learning) is not much visible among the technical workers. (…) The major concern they have is centred on their professional valorisation."* (The agro-food company's manager).

Interviewed workers have also reported that learning at work with other colleagues is very important. Informal training (learning) has been very much practised in both companies. In the ICT company, workers get together once a week for evaluating how well services to clients have been delivered. From this evaluation, working norms and rules are usually improved. In addition, a "week training package" has been developed to be delivered to new entrants by the more experienced technical workers. In the agro-food company, specific training actions concerning operation with very specialised machines have been developed and delivered by the more experienced technical workers (or specialised people from machine vendors) to less experienced workers. Learning experiences reported by some of the technical workers appear to have marked positive or negative effects as reported by those workers. Practical training in other companies or in specialised entities has been reported as a very rich experience by those who have taken it. On the other hand, training taken in some Training Centres has been reported as a frustrating experience.

> *"The trainer was only reading the text he brought with him. (...) I felt that he was not comfortable with the subject matter (…)."* (The agro-food company's employee).

"Many of the training contents followed by the Training Centres were not updated."
(The ICT company's employee).

Training costs and time availability are the main situational aspects that constitute barriers to participation of the technical workers in CVET in both companies. In the ICT company, the costs of training and time availability are much more linked to the employees since the major responsibility for workers' competence development was on themselves. In the agro-food company, those aspects are much more related to the company. Training costs have sometimes constituted an important participation barrier given the financing difficulties that the company was suffering at that time. Time availability constitutes a relevant participation barrier for training in the period of the tomato harvest. In Portugal, the tomato production is very much seasonal.

"One has to make sacrifices in money and in time if you want to be updated (…)."
(The ICT company's employee).

"There are two main aspects that can be assumed as barriers to technical workers' participation in training: (1) Financing difficulties of the company for supporting training costs; and (2) Workers' time availability in some periods resulting from the seasonal characteristic of tomato production."
(The agro-food company's manager).

Management and workers' positive attitude towards CVET was considered as the main favourable factors concerning participation in training. However, workers of both companies have also considered that payment of the training costs by the company would increase participation of workers in CVET. In the past year, each technical worker of the ICT company has taken about 80 hours of training while the agro-food workers have participated in 30 hours of training, on average.

Both the ICT and the agro-food companies pay special attention to introduction of innovations. According to managers of both companies, innovation and workers' continuing learning are the most important factors for maintaining competitiveness of the companies at the present time. Workers' perspectives (of both companies) are in line with managers' views concerning the introduction of innovations. However, the ICT company's workers have given more emphasis than the agro-food company's in the introduction of innovations. This is justifiable given the very rapid obsolescence of the computing components (hardware and software) requiring a quasi permanent updating effort. In addition, the computing equipment has a much shorter life than the equipment utilized in the tomato paste industry. For those reasons, both companies have developed a strategy to be permanently aware of innovations in their respective market. The tomato paste industry is member of a Portuguese Association of the Tomato Industry which, in addition to looking for international markets, delivers information on innovations to its members. When an innovation comes, mainly in terms of new equipment, the top manager asks for a cost-efficiency analysis in order to see what economic value will be got from the investment. Decisions about introduction of the innovation will be taken on the basis of that study results and on the financial situation of the company. The ICT company follows a different strategy; all workers read the subscribed "on-line" periodicals and pay attention (almost daily) to news on the Internet. The relevant new information is

then shared among all workers in their (weekly and monthly) meetings where decisions about the need for introduction of the respective innovations are made. The need for introduction of an innovation is then transmitted to the top manager who takes the final decision taking into consideration not only his workers' advice but also the opportunities and possibilities associated with the corresponding investment.

In general, it can be said that case study results are in line with the quantitative survey results. In fact, the case study results suggest that factors linked to individuals' characteristics appear to have more influence on workers' participation in CVET than other factors considered in the ISSTAL model. For instance, both managers and workers of both companies have (direct and indirectly) considered that workers' *images of learning experiences*, *attitude towards training (and learning), professional experience*, *intellectual flexibility, and time availability* are the more important factors influencing participation of workers in training. In addition, individuals' *level of education* (and/or initial training) also appears to be positively associated to participation in training. This conclusion is drawn from the fact that, in both companies, workers with higher levels of education (and/or initial training) had attended more hours of training in the last year. That aspect was even more evident in the agro-food company where lower schooling (basic school) individuals were working as undifferentiated workers. According to the agro-food company manager, those workers have no positive attitude towards training. Their eventual and apparent interest in receiving training would come when as a result of participating in training they were given extra money through payment of a "per diem".

Influence of workers' *ascribed roles* in their participation in training was inconclusive in both companies. First of all, there were not women among technical workers of both companies. And, secondly, differences among technical workers' age in each company were not relevant. Workers' age may not have a relevant influence on participation in CVET concerning this type of worker. In spite of workers' age average being significantly different between the two companies, technical workers of the two companies have the same positive attitude towards training and, in general, have considered the same (individual) aspects as the most important factors influencing participation in CVET. Influence of technical workers' *achieved roles* in participation in training was also not visible in both companies. However, workers' *level of education,* as indicated above, appears to be positively associated to level of participation in training. In fact, workers with higher levels of education in both companies have attended more hours of training last year.

Some difficulties in *access to training* by technical workers were indirectly referred by some workers of both companies. Workers of the ICT company have appointed training costs and time availability as barriers of some importance to their participation in training. Workers of the agro-food company have indicated time availability, during tomato harvesting, as a relevant barrier to their participation in training. Time availability during tomato harvesting indicated by workers of the agro-food company could also be read as a situational factor. In summary, it can be said that case study results illustrate and confirm, in general, conclusions drawn from the survey data.

Final considerations

The case studies appear to confirm most of the results from the survey conducted with the agro-food (Alentejo) and ICT (Lisboa & Vale do Tejo) companies. In fact, both managers and technical workers that were interviewed have directly or indirectly indicated that *image of their previous learning experiences* (retained information), and *attitudes towards training (and learning)* (attitudinal dispositions) appear to be the most relevant aspects influencing their decision to participate in further activities of CVET. Those conclusions are in line with other research results that indicate that previous learning experiences and attitudes towards learning have a significant effect on people's willingness to participate in further learning activities (Brookfield, 1996; Field, 2000; Longworth & Davies, 1997). The same conclusion can be drawn for the *intellectual flexibility* (personality & intellectual flexibility) particularly concerning the flexibility in modes of learning and preferred training strategies (Brookfield, 1996; Field, 2000). Interviewed workers and managers have reported that workers are more focused on the training content than on the training strategy since their major concern was centred on their professional valorisation.

Positive association of workers' *level of education* (social background & social roles) with level of participation in training was also suggested by the case study results. However, it should be noted that this factor does not intervene alone. Technical workers with higher levels of education had attended more training hours in the previous year but they also reported that time availability and training costs (*access to training*) were not a difficulty at that time. This linkage of the level of education with other aspects concerning influence in participation in training may point to a misleading conclusion in which level of education appears to be a more important factor for predicting level of participation in training. Although several studies have concluded that previous educational attainment may be used as a statistically significant predictor of participation in CVET, one cannot forget that those results were obtained in certain social and organisational contexts (Brookfield, 1996). For instance, the present case study was concerned with technical workers who were more highly educated and working in successful and innovative companies. The same line of reasoning may be done for the *professional experience* and *intellectual flexibility* factors which are apparently positively associated with levels of participation in training. As reported above, the influence of workers' *ascribed* and *achieved roles* (social background & social roles) in their participation in training was not visible in the case study. However, one cannot forget that individuals' *achieved roles* are closely related to their level of education.

Given that the case study confirms, in general, the survey results, the conclusion that the ISSTAL model may serve as theoretical framework to analyse relationships between a set of characteristics and participation in training activities of the technical workers of agro-food and of ICT companies can be reinforced. The majority of the analysed dimensions in the survey study were reported by the interviewed managers and technical workers to be related to participation in continuing education offerings. Since the findings suggest that *images of learning*, *intellectual flexibility*, and *attitudinal dispositions towards training and learning* are the most influential characteristics on participation in continuing training offerings,

public training institutions should implement strategies to demonstrate the importance of training for professional and company development. In addition, it is essential not only to provide training for updating technical skills but also for developing a set of more transversal key skills such as problem solving, communication, and learning how to learn. Furthermore, 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 case study results have also indicated a need for promoting different strategies for learning and understanding how important lifelong learning is for technical workers' competence development. For this reason, promoting and facilitating self-learning, mainly through e-learning strategies, of the technical workers constitutes an important added value for enterprise competitiveness and individual employability.

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Spain

F. Blázquez Entonado, M. Lucero Fustes & P. Blázquez Expósito

Case Studies in the Building and I.T. Industries in Extremadura

Introduction

When deciding which enterprises would be the object of our case studies, we have opted for one of each of the sectors where we have been studying the participation of workers in continuing vocational training: an IT enterprise and the other from the Building sector. With the aim of choosing two different types of enterprises, and although conscious that in this region more than 95% of enterprises are micro enterprises, we have, nevertheless, opted for a large enterprise in the building sector and a micro-enterprise in IT. Both possess the quality of enterprises with good practices and each has different peculiarities.

– *The Building Enterprise* enjoys recognised prestige among Extremeñan businesses. It is at a stage of clear expansion, with a diversification of sectors and specialities (as we will describe later) with a variety of public and private buildings and an appreciable balance of results.
– On the other hand, *the IT enterprise* is a young dynamic enterprise, all its staff - around a dozen - (the director, the manager, and all the workers) are under thirty-two years old. It is also expanding and has experienced a clear rise in turnover.

These are two different enterprises that we consider express more the future than the present of Extremadura and which are examples of the emerging group of entrepreneurs on which the region has depended over the last few years. We are aware that for our case study we have not presented enterprises representative of Extremeñan businesses in general but rather representatives of a tendency in a region, backward as regards business networks and which due to a series of circumstances, is growing faster than the national average and generating a revived and vigorous business community. After outlining the processes followed in our case studies, we will describe briefly the most characteristic features of each sector before presenting each of the enterprises studied.

Participants

In Case Study I there was a total of 2 *subjects*, chosen deliberately because of their position in the firm. One of them was the director and the other, with a higher degree in computer Studies, aged 28 was director of development in the firm. Both have been working with the firm since 2002. In Case Study II there were a total of 7 *subjects*, chosen deliberately because of their position in the firm: the director of human resources, an administrator of works, two site directors, a master builder and two unskilled workers. The *variables* adapted from Smith and Cookson (1980) for inclusion in the case study are indicated below:

– *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), quoted in 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 that, 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 made up of 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 the 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 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.1

Process of data collection

In order to carry out the case studies, a semi-structured interview was designed in which questions referring to the different variables mentioned appear. In these differential nuances for directors and workers are contemplated but using the variables of the ISSTAL model as a reference for all of them. The field study was based on audio recordings and subsequent transcription of all the interviews. The interviews were carried

[1] Please see the Spanish report in this volume for a graphical representation of this model.

out by a non participant observer and each one lasted around 35 minutes, divided into three phases: 5 minutes to inform the interviewee of the aims of the research, as well as to obtain general information about the enterprise (type of organisation, number of employees etc.); 25 to carry out the interview in depth; and approximately another 5 minutes to inform the interviewees about the results obtained in previous research, as well as the principal conclusions obtained from the focus group.

Process of data analysis

Once the two groups of interviews were taped and transcribed, the qualitative analysis was based on a process of categorisation of the interventions of those interviewed according to the variables considered in this study. In this respect, some recent studies have been based on the application of previously determined categories, theoretically or empirically, while others have adopted an inductive perspective. Our analysis, rather, opts for a deductive-inductive approach, based on the variables used in previous empirical studies. (Cookson, 1986; Blázquez & Lucero, 2004; Figueira, 2004).

Results

The following tables show the principal results obtained from the semi-structured interviews classified according to the variable about which we intended to obtain information.

Case Study 1: IT Sector in Spain and Extremadura.

As our report on IT shows, where the degree of incorporation and the number of enterprises and employees implicated is concerned logically it is greater in the more industrialised communities: Madrid, Catalonia and the Basque Country, communities which are situated above the national average in the use of new technologies, while a significant backwardness can be observed in Extremadura and Castilla-La Mancha. Thus if the weight of the IT sector in Spain were 100, in Madrid it would be 256,4, in Catalonia, 127,8 - speaking for the most advanced - while for Castilla-La Mancha it would be 49,6 and for Extremadura it would only be 34,4**.** Extremadura is the only one below 50% in the synthetic index of penetration of IT. Extremadura is the Spanish region with the least number of telephones and, in addition, the lowest index in the use of cell phones and the Internet. Together with Castilla-La Mancha, it occupies, with an identical percentage, the last place in the national classification of Net use. Despite these somewhat cruel figures, Extremadura is trying, at all costs, to impose the Information Society. Like the rest of the Autonomous Communities, it has a **Strategic Plan for the Information Society** and a **Foundation for the Development of Science and Technology.** In addition, where the business sector is concerned, emergent enterprises and those in process of integration are to be found principally the Canary Islands, **Extremadura,** Navarre, Aragon, Andalucía, etc.

As regards educational level of personnel and the level of IT equipment and its use by enterprises, the deficit of human resources in this field could be an obstacle for the development of the Information Society in Spain. The level is not low in Extremadura, in

whose university various degrees related to IT are offered. As we know, the problems which limit the introduction of IT are not only related to human resources, but extend, in a similar proportion, to other aspects of the life of enterprises such as size, type of activity or financial aspects. It is important to highlight the attention which IT in Extremadura is offering to marginal social groups, in which are included women (mainly in rural areas) mental and physical handicapped people, older people, immigrants, people with a low economic or social level, cultural minorities etc.

Enterprise in the IT Sector: "Pulso. Sistemas de Gestión"

This new technologies enterprise emerged as a tangible response to the need for change which the Information Society is provoking among organisations: not only the public Administration but also Institutions and Firms according to the director. Its objectives are to define these necessities, analyse their implications within an organisational system and investigate and define the possibilities for providing solutions. From there to go on to determine and develop the most adequate solution providing in addition elements of added value. Since its creation in 2002, when it began its work as *an enterprise specialised in the development of integral solutions in IT,* it has generated a team of professionals which supposes a solid base with a considerable degree of self sufficiency. The firm, with 10 employees at the moment, expects to increase staff to 15, all of them between the ages of 22 and 30, by the end of 2004.

"Pulso. Sistemas de Gestión" maintains at the moment a strict policy of alliances designed to offer the best range of services to its clients. The results are an increasing number of enterprises which opt for them as global partner. Among their clients are many areas of Public administration, Institutions and Private entities from Badajoz, Barcelona, Cáceres, Madrid, Melilla or Valladolid. Their politics on continuing training supposes that all members of staff can count on having up do date knowledge adapted to the firm's culture.

Variables		Information obtained
		Interview 1 (Director of "Pulso. Sistemas de Gestión")
Social Background and Social Roles		Place of origin: city Civil state: married Level of studies: Higher degree Post: Director
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	Disposition towards education and training	"We see continuing training as something essential. We consider that rather than doing specific training courses this should be continuous. Continuing training is necessary because in our sector new programs or new versions are constantly appearing which are then obsolete in months. A fundamental aspect is self-learning which requires initiative and preoccupation on the part of the employees. In our firm daily learning is basic. It is not so much a question of specific knowledge to resolve specific problems but rather questions relative to the dynamics of programming.etc." "The employees feel very identified with the firm's style and this motivates training in order to be able to progress. The employees have to learn through the structure of the firm" "There exists a good predisposition towards continuing training within the firm without differences as regards sex, area or age" "Training needs emerge through the motivation of the necessity to learn, to provide solutions to problems met and to improve capacity..." "the people in the firm who most need training courses are us the management, we meet up with a quantity of challenges, we do not conform but try to learn and learn continually"
	Intensity of participation in training courses	"Although we try to plan formal training, like Masters or other courses, with which we are wholeheartedly in agreement, it is difficult for us. Although we do try to take advantage of seminars, talks etc, but not in a formal way. We are aware that we should improve our training system, for example, in languages and other specific aspects" "Management aims to train in aspects complementary to the specific work of the employees in many cases this is individual training. They are not courses as such but do teach them to do things." "Of course, employees also attend courses outside the company"
	Support and Incentives from the firm for training	"The firm pays the costs of the journey if the course is interesting" "I attended a course on management offered by Chamber of Commerce and occasionally attend talks/seminars give by the Extremenan Employment Service and the Ministry of Economics and Labour of the Junta of Extremadura."
	Methods used to inform workers about training courses.	"Sometimes the information comes from us and at others they find out through Internet"
	Characteristics which training courses, trainers and methodology applied should have.	-

Tab. 3 Interview with the Director of the IT firm: Pulso Gestión y Sistema

Variables		Information obtained
		Interview 2 (Development director of Pulso Gestión y Sistema)
Social Background and Social Roles		Age: 28 Place of origin: village Civil state: :unmarried Level of studies: High level vocational education and training Post: Director of development
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	Disposition towards education and training	"Due to the profession we have, continual training is normal. If there are seminars, courses, talks which might interest us we do not hesitate to attend. We don't go to all the courses because what interests us is specialisation for the staff." "Really, given the profession we have, I feel obliged to train. Everything I know now I have learned since I began to work here, we have to recycle or we become out dated"
	Intensity of participation in training courses	"In the last year I haven't attended any course"
	Support and Incentives from the firm for training	"If we have to go to some place the firm pays the journey, even during working hours although they don't give incentives"
	Methods used to inform workers about training courses.	"Through the bosses"
	Characteristics which training courses, trainers and methodology applied should have.	"The best way is to find out via email from the people who organise the course." "If we are going to take part in training courses, these should help to improve our capacities and also consider helping the firm" "At certain times, perhaps, the amount of work does not permit us to attend such courses" "Impediments for doing courses: only having too much work. In summer, for example, there would be no impediment" "Profile of those who give the course: it should be somebody very well prepared with a lot of knowledge who can provide us with something" "Place: there is no problem for me or for the firm for me to go anywhere to attend a course" "Last experience: good, because they explain things from another point of view"

Tab. 4 Interview with employee (Director of development) of the IT firm 'Pulso Gestión y Sistema'

Discussion and conclusions

For the director of "Pulso. Sistemas de Gestión" continuing training is essential for the firm. Due to the speed at which the sector of new technologies is developing, to be up to date on all the technological advances produced is basic. To achieve this, in his opinion, the most adequate method is self-training. But self-training demands motivation, initiative and preoccupation on the part of the employees. Management is aware of the need to work so that employees feel identified with the firm's style from which the necessity for self-training emerges. In the case of the enterprise studies, and according to the director, "the predisposition of workers for continuing training is very good, without differences of age, sex or area". Training is not carried out within the firm, but he is aware that IT

permits a certain degree of self training based on daily learning, although the management is in favour of possible courses, masters or seminars which workers could attend. There is no objection to employees attending whatever courses they require, in fact they attend those that interest them, but there are no economic incentives to motivate them. Management also tries to train in complementary aspects to the specific tasks of the employees. In many cases this is individual training.

As regards the worker we have selected in this firm involved in IT, training in his job has to be and is continuing training. His personal experience has shown him that his daily work has to serve to learn more every day. Nevertheless, whenever he has been able to he has attended courses or seminars although, in the last year he has not attended even one, as he has had no information about courses which could provide him with new knowledge. On the part of the firm, there would be no problem about covering the costs and the journey to wherever a course was available, as has happened on other occasions, although there are no economic incentives to attend. Where disposition towards training is concerned, this employee claims to be open to any type of course, as long as this provided benefits for him and the firm, since in his opinion:

"in the profession we have, I feel obliged to train. We must update or if not become out of date".

The only impediment he sees to attending training courses is the little amount of time which his work allows him to be free. The best time for receiving training would be the summer when there is a lower volume of work; the best way to find out about courses would be through Internet, via e-mail, from whoever delivers the course.

Case Study 2: The Building Sector in Spain and Extremadura

The importance of the building industry in the Spanish economy is well known. Up to the point that the sector is considered decisive for its capacity for growth and for its multiplying effect as a whole, particularly on production and employment. The weight of the building industry in the Spanish economy has in the last decades provided around 8% Gross National Product (GNP) to the combined national production, second only to the service sector. The potential of the sector to generate employment is also relevant. The average number of the employed in the sector between 1999 and 2002, according to the Questionnaire on Active Population (EPA) elaborated by the National Institute of Statistic was 1.761.606, which represented 11.34%. And in fact, with figures for the year 2002, the building industry provided employment for 1.913.175 workers of the national work force, which represents 11.8% of all those employed in the different productive sectors in Spain. The Caixa Catalunya's Studies Service claims that the building industry generated 20% of new jobs from 1998 to the end of 2003, which has converted this sector into the great supporter of the growth of GNP in Spain.

If to these figures we add the 116.000 millions of Euros which was the production in the building industry in the year 2002 we can appreciate the importance of the activity in the Spanish economy as a whole. The building sector grew in Spain 38.1% in the period 1995-2002, which represents 13 points above the growth of the Spanish economy as a whole, which was 25.2% in the same period, according to the report of the Caixa Catalunya's

Studies Service. This same study pointed out that the impact of the building sector in the GNP as a whole was different depending on the community: from the 87.6% of the Canary Islands, 65% of Cantabria, 61% of the Valencian Community to only the 15.1% of Extremadura which was the community with the least level of growth within Spain as a whole. But the same study warned about dependence on the building industry in autonomous communities with the lowest incomes such as Extremadura, Canarias or Castilla La Mancha in which the Gross Added Value (GAV) is 11%. Nevertheless, the building sector is the principal motor of the regional economy and the one which employs the largest number of workers in industry in the region; around 15% of the total of regional activities. In this area it is only surpassed by the service sector that now appears above industry and agriculture, despite the fact that this is a pre-eminently agricultural region. As in the rest of Spain, in recent years, the sector has absorbed a large number of workers proceeding from farms.

As regards the provinces, the weight of the sector as a creator of employment is greater in the province of Caceres where it occupies 16.89% of the population, while the percentage is reduced in that of Badajoz to 13.67 points. But it is the comparison of the sexes which is most worthy of comment and which produces greater differences. The sector employs more than one in five Extremeñan males, 21.17%. On the other hand, only 1.6% Extremeñan women work in the building industry. In addition, because Extremadura lacks industries many of the industries it has are accessories of the building sector. Among the problems that affect the building industry, not only in Extremadura but at national level, the most outstanding are the high levels of accidents at work and the lack of qualified workers. They are two handicaps that go hand in hand and are directly related

A serious problem therefore is the lack of vocational education and training for personnel. In all of Spain, and especially in Extremadura, we can observe the lack of training in specific competencies traditionally called trades proper to the building industry, such as builder, tiler, welder, concrete worker, plasterer, etc. Every day, fewer young people go as apprentices to the building sites due of the harsh conditions of the trade, which worries the leaders of the sector not only because of the lack of training (which is now obvious in the actual trades mentioned but also with an eye to the future as regards: prevention of accidents at work, quality, environment and new technologies), but also for the minimally qualified work force.

90% of **enterprises in the sector** have less than 20 workers, the average number of workers in an enterprise in this sector being 8. This figure, which is quoted for Spain as a whole, is very representative of Extremadura, where micro-enterprises predominate, as we proved in the field study carried out for the application of the questionnaire in the first part of this project. In enterprises dedicated to Public Works and the building of medium sized housing there are more than 70 workers. This is the case of the enterprise we have chosen for our case study for although it is one of the few large enterprises in the sector in Extremadura, it has a recognised prestige at regional level and is well known for its 'good practices' as a regional enterprise.

Enterprise in the Building Sector: "JOCA. Ingeniería y Construcciones"

JOCA Ingeniería y Construcciones is without doubt one of the enterprises with greatest influence in Extremadura, as we are talking about the result of many years experience in the Engineering and Building Sector. It is the pioneer enterprise of the Joca Group created in 1970, a group which in the hands of its promoters developed from a small society for Hydro-electric installations, which operated in a reduced area, to an important multi-sector activity, materialised in six enterprises which have managed to be present to a large extent in national and international markets. Since its creation therefore, the Joca Group has carried out a process of diversification into other sectors and at present is made up of six enterprises: JOCA, S.A, SACONSA, CODECONSA, AGROTEX, S.A, INEA, S.A. and VEGENAT, S.A. The first three are integrated into the service sector and the other three in the food sector. Thus they cover a wide range of activities, operating in very dynamic sectors of the economy, so that previsions for growth programmed in the last four-year plan have been easily reached.

JOCA Ingeniería y Construcciones employs at the present moment some 330 workers, between managerial staff (15) technical team (some 120), employees (95) and workers (100 approximately). The technical team is made up of Civil Engineers, Architects, Industrial Engineers, Chemical engineers and Telecommunication engineers which allows them to tackle hydraulic works or sewage treatment, as well as civil constructions, municipal services, sporting installations, etc. With a catalogue of clients including the central government, regional, local and other public entities, it develops its sphere of action at national and international level It has numerous delegations: head office is in Badajoz, the commercial office in Madrid, and others appear in regions like the Canary Islands, Catalonia, Castilla La Mancha, Castilla León, Andalucía or in Portugal.

Results

We will now show in the following tables the principal replies obtained in the semi structured interviews, classified according to the variable about which we intended to obtain information.

Variables		Information obtained
		Interview 1 (Director of Human Resources JOCA)
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	Disposition towards education and training	▪ "Continuing Training is fundamental for the firm and is therefore one of our priorities" ▪ "Where the disposition of workers towards training is concerned frankly in ten years of training courses, the experience is that the firm is more preoccupied with training than the workers We have attempted to motivate participation with catalogues, publicity and questionnaires to look for adequate times etc. but we have not managed to increase participation."
	Intensity of participation in training courses	▪ "we organise approximately thirty courses a year, although some of them are offered three or four times a year, for example, those imparted to personnel who are beginning"
	Support and Incentives from the firm for training	▪ "There are no incentives for workers to take part in training courses
	Methods used to inform workers about training courses.	▪ "In December we issue a questionnaire asking for information about the training needs of workers for the following period. With these needs we draw up a training plan, related to the Annual Operative Plan".
	Characteristics which training courses, trainers and methodology applied should have.	▪ "For training there exists external help from FORCEM and the Junta of Extremadura, but the courses take place within the firm, with teachers and timetable chosen by the firm" ▪ "The impediments which the workers claim are that due to the great volume of work there is no time for courses in working hours and they will not admit doing them outside them" ▪ "Training is almost obligatory. The majority of courses require confirmation of assistance in order to receive the funds. So, in the end they all tend to come and declare interest" ▪ "We value highly the training of trainers. After the courses we pass questionnaires and we get the pupils together to comment on the teachers, duration… to correct errors for future editions" ▪ "For us the factors that favour participation would be: 1. flexibility in workers' timetables and work load so that we can achieve a correct evaluation of jobs. 2. receive information from management of the annual operative plans to make workers participants in the objectives of the firm. 3. achieve greater employment stability given that this is a very mercenary sector, people identify very little with the firm" ▪ "The duration of the courses should be in relation to training needs Management for example do not appear in training plans and neither do unskilled workers, given that it is very difficult to plan them. Where the rest are concerned, there is not a determined number of hours, it fluctuates according to necessities"

Tab. 5 Interview with the Director de Human Resources of the Building Firm JOCA

Variables		*Information obtained*
		Interview 2
Social Background and Social Roles		▪ *Civil state: unmarried* ▪ *Level of studies: Higher degree (L.A.D.E.)* ▪ *Post: Building administrator*
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	*Disposition towards education and training*	▪ "The courses I have attended have been quite interesting although in some aspects they were not really directed to my work in the firm"
	Intensity of participation in training courses	• "In the six months I have been at JOCA I have attended two training course with a total of 25 hours. Both were offered inside the firm by personnel from the company
	Support and Incentives from the firm for training	• "There is no type of incentive on the part of the firm to attend courses neither economic nor professional promotion"
	Methods used to inform workers about training courses.	▪ "Up to now in the time I have been working in JOCA, the firm has always been the one to propose the courses, via the bosses. After attending, the firm hands out questionnaires to find out our satisfaction with all the aspects of the course"
	Characteristics which training courses, trainers and methodology applied should have.	▪ " The optimum conditions which to my mind give the training courses are those that are offered in my area and above all during working hours, although it would not be a problem to travel to places nearby. The only impediment I would find for not attending training courses is in when they have nothing valid to offer me for my work" ▪ "Where trainers are concerned it seems basic that they should know how to explain and transmit clearly their knowledge"

Tab. 6 Interview with the Administrator of Works of the Building Firm JOCA

		Information obtained
		Interview 3
Social Background and Social Roles		▪ *Age: 36* ▪ *Level of studies: Vocational education and training* ▪ *Post: Master builder*
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	*Disposition towards education and training*	▪ "Training in my job should be continuous. Evidently in the building industry, recycling is very important because new techniques, materials and tools appear with great speed. There is no remedy to being up to date, or you learn or you are left behind even losing your job due to the fact that we are in a competitive world."
	Intensity of participation in training courses	▪ "Of the courses I have attended in the last year, two of them have bee related to safety. My personal valuation of these courses was very positive. In one of them the teachers were people from the firm and in the other people from outside of JOCA, and in both cases I was satisfied with them because the trainers knew how to transmit new knowledge. These courses occupied a total of 70 hours"
	Support and Incentives from the firm for training	▪ "No I have never received any incentive from the firm to attend courses. The courses are voluntary"
	Methods used to inform workers about training courses.	▪ "The bosses recommend them, everyone is free to do them or not"
	Characteristics which training courses, trainers and methodology applied should have.	▪ "Training courses should take place in working hours and at the expense of the firm. As a worker I do not think I should use my free time to receive training. On the other hand I would have not find it inconvenient to have to travel anywhere to attend courses" ▪ "Where trainers are concerned, the teachers should have a lot of knowledge about what they are teaching, I don't mind whether they have degrees or not because whoever is capable can contribute things" ▪ "The only impediment for not doing courses would be if they coincided with a period when my work would not permit me to be absent form the building site, then I would have to decide whether to do it or not"

Tab. 7 Interview with a Master Builder of the Building Firm JOCA

Variables		Information obtained
		Interview 4
Social Background and Social Roles		▪ Age: 26 ▪ Level of studies: Degree (technical architect) ▪ Post: Site Director
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	Disposition towards education and training	▪ "In this profession you need to know what the market is like to be able to work correctly in it and that is achieved with adequate continuing training" ▪ "All the courses I have received in the firm have been very interesting and have provided me with a lot of know how s"
	Intensity of participation in training courses	▪ "In my experience in the firm I have received a lot of different types of training courses, some basic others much more concrete. In the last year I have attended 5 or 6 courses which would add up to about 80 hours " ▪ "In fact two years ago I did a Masters of 6 months duration outside working hours. The firm put no impediment for me to do this Masters"
	Support and Incentives from the firm for training	▪ "I have not received any type of incentive either economic or professional"
	Methods used to inform workers about training courses.	▪ "Information about the courses I have attended reached me through the bosses by internal mail, and for those outside the firm I usually find out about them through the press or through Internet"
	Characteristics which training courses, trainers and methodology applied should have.	▪ "In the majority of cases the trainers lack a university degree but that is not a problem for me because I believe the most important thing is to be able to transmit and that to solve your doubts throughout the course, and that is how it has been " ▪ "The ideal would be that the courses were arranged in the workplace or nearby, preferably in working hours although in the case of a very interesting course which took place for example at a weekend I would have no problem" ▪ "The only reason for not doing a course would be because an excessive work load did not permit it"

Tab. 8 Interview with Site Director I of the Building firm JOCA

Variables		*Information obtained*
		Interview 5
Social Background and Social Roles		▪ *Age: 23* ▪ *Level of studies: Degree (arquitectural technician)* ▪ *Post: Site Director*
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	*Disposition towards education and training*	▪ "I believe that continuing vocational training in the firm is very necessary, when you leave university you leave with certain knowledge but they are no use for entering fully into the world of work. Then, you need the training the firm offers to develop in your work" ▪ "In addition, this sector is changing and we can't remain stationary, we need to be constantly modifying and widening our knowledge"
	Intensity of participation in training courses	▪ "I have received courses both inside and outside the firm, the latter always outside of working hours. In the last year I have been on 4 courses with a total of 50 hours."
	Support and Incentives from the firm for training	▪ "I have not received any type of incentive either economic or professional"
	Methods used to inform workers about training courses.	▪ "The information about the courses offered within the firm arrived through the bosses"
	Characteristics which training courses, trainers and methodology applied should have.	▪ "The trainers should have good communication skills, express themselves well and transfer the knowledge they already have" ▪ "It would be very difficult to attend other courses outside the firm in working hours, the firm would surely not permit it, although it has never been suggested" ▪ "Preferably courses should be offered in my city" ▪ "In some courses I have felt the lack of a little individualisation, they were too numerous, 10-15 people and as not all those who attended had the same level, nor learn at the same speed, in the end we all waste time. The answer, probably, would be to form smaller groups"

Tab. 9 Interview with Site Director II of the Building Firm JOCA

Variables		*Information obtained*
		Interview 6
Social Background and Social Roles		▪ *Age: 23* ▪ *Level of studies: without certificate of primary studies* ▪ *Job: Unskilled worker*
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	*Disposition towards education and training*	▪ "The training courses I have been to were very interesting I learned a lot of things which have been useful to me at work "
	Intensity of participation in training courses	▪ "All the training courses I have done, a total of 7, have been outside the firm before I joined the firm. They were all related to building, through the unemployment agency (INEM) and I did them during working hours because then I was unemployed" ▪ "In the firm we have been offered courses outside working hours but I didn't do them because I couldn't at that time"
	Support and Incentives from the firm for training	▪ "There are no incentives on behalf of the firm".
	Methods used to inform workers about training courses	▪ "Through a colleague"
	Characteristics which training courses, trainers and methodology applied should have.	▪ "The best thing would be for training to be given in working hours and if it is not like that at least they should give us rest days. I would prefer these courses to be in my town and above all that they are very practical because in our job the theory is not much use" ▪ "The best way to find out about courses in the firm is by word of mouth, through some colleague"

Tab. 10 Interview with Unskilled Worker I in the Construction Firm JOCA

Variables		Information obtained
		Interview 7
Social Background and Social Roles		▪ Age: 24 ▪ Level of studies: Certificate of primary education ▪ Job: unskilled worker
Attitudinal Dispositions, Retained Information, Situational Variables & Participation in VET	Disposition towards education and training	▪ " ▪ "I have been many years in the building trade and at times on some sites I find new things so I need to have them explained to me. I am completely open to any course and I would like to do more courses than I have done up to now"
	Intensity of participation in training courses	▪ "In the last year I have only received one course of approximately 15 hour"
	Support and Incentives from the firm for training	▪ "There are no incentives from the firm "
	Methods used to inform workers about training courses	▪ "I have found out about the courses from my colleagues on the building site itself"
	Characteristics which training courses, trainers and methodology applied should have.	▪ "The ideal is that the firm offers the training " ▪ "I believe it is better to attend courses in working hours and not in our free time. Having to travel to another city to attend courses would be inconvenient for me because I do not have a car, I prefer training on the building site itself" ▪ "the biggest problem that I can see for doing courses is if they are not in working hours as I wouldn't want to do them in my free time and in addition, I do not have any means of transport to travel"

Tab. 11 Interview with unskilled worker II of the Building Firm JOCA

Discussion

Without doubt some of the workers of JOCA Engineering and Constructions believe continuing vocational training is essential for the success of their work in the firm. They claim that the sector in which they find themselves is in constant renovation and due to the enormous competition existent, training becomes fundamental if they do not want to lose their jobs. Nevertheless, the director of Human Resources complains about not finding the expected disposition on behalf of the workers, despite attempts to motivate

participation with catalogues, publicity, and questionnaires to find suitable times for courses etc. But according to him, they have not managed to increase participation.

Of the workers interviewed, in very few cases have they received vocational training outside the firm since they began working there, except for the unskilled workers who had courses from the Employment Service before joining the firm. The training of the vast majority has been within the firm and run by the firm. All received initiation courses in the first months to get to know the firm's philosophy and afterwards more specialised courses for each post, except for the unskilled workers. In general, the level of satisfaction with the courses received is quite high, not only in knowledge acquired, but also with the teachers and the timetable. For the workers it is important that the vocational training be carried out during working hours, as long as the workload permits. Few would object to training at week-ends or during holidays as long as the course was really interesting for them. The lower grade workers insist that training should be only practical, during working hours or in exchange for rest days later and in the same city as their work.

Conclusions by variables

1) Disposition towards continuing training

In enterprises catalogued as using 'good practices' by regional businesses, support for continuing training for staff would seem to be normal. Management in both firms consider training for their workers as important but we notice an indicative detail: one of them opts for self-learning on a day to day basis and the other describes the efforts made to provide the most adequate training for the workers, who do not always show the same interest in training programmes as the does the firm and as he himself as director of human resources would like. In this same firm they impart induction courses for those starting work in the company, "so that staff get to know our philosophy". It must be recognised that the disposition of management is positive, however, the directors themselves do not appear to be entirely satisfied with the attitude or disposition of their employees towards their continuing training, despite efforts to find out through questionnaires and so on their preferences. The employees have stressed a positive attitude, always with the reservation, as we have also noted in the research as well as in the discussion group, that training should not be in their free time but provided by the firm during working hours or in over-time.

2) Intensity with which they participate in training courses

There exist marked differences between the micro-enterprise – in which all the employees have received training in the last year – and the micro-enterprise for whom imparting training courses from within the firm itself - as happened in the previous case - is difficult. The small enterprises recognise their difficulty for offering training themselves although they are conscious nevertheless that this should exist for their workers. In any case low level workers - and those who are not permanent – do not usually receive training.

3) Support and Incentives on the part of the Firm for training

It seems that only being in favour of training is not a sufficient incentive for employees. Implicitly we feel that it would favour attitudes if continuing training implied an increase in wages or some other reward. We can conclude that a culture of providing incentives for continuing training on the part of businesses does not exist. We can state categorically that none of the nine workers interviewed had received any incentive for their continuing training.

4) Method of informing workers about the training courses offered.

Channels of information for employees to find out about the possible continuing training available do not exist. Although for the majority, information comes from the firm itself, in other cases it comes from colleagues and it seems that other channels should exist. In any case, the large enterprise carries out a detection of training needs and designs a training plan, linked to its Annual Operating Plan, but nevertheless, the continuing training of unskilled workers and those contracted for specific building projects, receive neither information nor, normally, continuing training.

5) The characteristics which training courses, trainers and the methodology applied should have

We have had difficulty in collecting more explicit information which was not "that they teach us what we need" or "that they know how to communicate well what they know". In short, we have not confirmed the same importance that the members of the focus group gave to the methodology of continuing training.

6) Factors which favour positive attitudes towards continuing training.

Where factors which favour participation in continuing training are concerned, management has expressed some interesting opinions to add to the conclusions of our study:

- One factor would be a greater flexibility in working hours, evaluating the work load and allowing and integrating continuing training within such time with flexibility.
- Another important variable would be job stability, so that the worker is able to identify with the firm.
- Once that is achieved, information from the firm about the continuing training plans so that workers can participate in achieving the firm's objectives.
- Finally, in our direct and profound contact with the firms, we have been able to appreciate the difficulties small businesses - micro enterprises - have to put into effect the continuing training they consider essential but which is so difficult for them to organise.

This last point is particularly worrying for this region in which more than 95% of businesses are small.

United Kingdom

Alan Brown

UK Case Study of participation in continuing vocational education, training and learning in an engineering supply chain network

Introduction

The PARTICIPA project involves an investigation into the factors influencing the participation of technical workers in continuing vocational education, training and learning (CVETL) activities in six countries. The initial findings have suggested that participation in continuing vocational education and training (CVT) is more influenced by individual agency in Portugal, Spain and Greece, whereas structural factors (in terms of forms of provision of CVET and learning) are more influential in Germany, Italy and the UK.

Case Study Methodology

The completion of a case study for each participating region fulfils the sixth phase of the PARTICIPA project on continuing vocational education, training and learning (CVETL). In this phase, data was collected by semi-structured interviews and non-participant observation from one case by each participant European region chosen according to specific criteria established after the survey phase. The case study was intended to deepen results from the previous phases in order to understand more fully the participation of technical workers in CVETL activities. The original intention was that the case to be studied may be a SME or constructed by parts of different SMEs according to the characteristics of the participating region and sector of activity studied. However, because in the UK case the CVETL for a number of SMEs was organised collaboratively in an aerospace components supply chain learning network the "case" will be the responses of **three** SMEs to the challenges of facilitating continuing learning, development and continuous improvement.

Criteria for choosing a case study

- The case study is "constructed" from the responses of three different SMEs participating in CVETL activities in the same sector of activity - in this case the companies were linked together in an aerospace engineering supply chain.
- The companies were chosen because they can demonstrate "good practice" in improving people's engagement in training and learning related to competence development and meeting business needs
- The chosen companies all have a significant proportion of full-time technical workers.

Development of the case study

- The case study was developed around the factors influencing technical workers' participation in CVETL.
- The considered participation factors closely follow the major dimensions of the ISSTAL model.
- Results from the survey and focus groups phases highlighted the significance of supply chain learning, so the case study clearly builds on results from earlier phases of the research.
- The case study includes a description of the company's training and support for learning policies and strategies for technical workers.

Dimensions

The case study investigated the following aspects of company policy and practice and worker behaviour in the three companies participating in an aerospace supply chain network based in an area straddling the West Midlands / South West English regions:

- Training policies
- Support for learning (& competence development)
- Social background / roles of employees & organisation of work
- Personality & intellectual flexibility (search for knowledge; helping learning of others)
- Attitudes
- Learning experiences
- Situational factors (barriers to participation)
- Participation in CVET / Learning
- ICT strategies & practices.

Data collection

Interviews were conducted with employees at different levels and this was supported by non-participant observation and analysis of documentary and video sources. The three companies involved in the case study had 60, 100 and 204 employees respectively. Because some of the key CVETL activities took place in the lead company of the learning network (a major aerospace systems supplier) interviews were also conducted with employees from that company, even though it was not an SME. This was in order to provide a contextual background for activities across the supply chain as a whole. The data collected was to be analysed using the ISSTAL dimensions as an organising frame. The focus of the data collection was upon engagement in substantive learning rather than in participation in formal training per se. In this way it was 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, especially for technical workers working in small and medium size enterprises. This also highlighted the interaction between formal and informal approaches to learning, skill development and knowledge creation.

Contextual background

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 has been upon organisations in advanced supply systems in the aerospace industry. The supply chains in the aerospace industry are not confined to a single region, but for the purposes of mutual learning, development and support supply chain learning networks do have a degree of geographical clustering. The three companies chosen for this case study are participating in an aerospace supply chain network based in an area straddling the West Midlands / South West English regions. Both these regions have clusters of both large and small companies that have been involved in precision engineering for well over fifty years.

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. Recently large companies have sought to develop much stronger links with a smaller number of suppliers in 'their supply chains'. In the case chosen the supply chain is clearly driven by 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. On the other hand, the lead company (a Tier One supplier of complete aerospace systems) is seeking to develop more of a partnership arrangement with chosen suppliers. This changing contextual background of supply chains in engineering gives an indication of the extent to which continuing vocational education, training and learning in the engineering industry needs to be considered across companies as well as within them.

The main capabilities sought in suppliers by the lead company 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 development and other functions across the supply chain. One example of this process is that if a company is awarded the highest supplier ranking the components or sub-systems supplied by that company go straight into the production process of the lead company without further inspection or checking. The driver of this process is an attempt to improve manufacturing practice through a focus upon continuous improvement (and on quality, costs and delivery). This was linked with an explicit attempt to follow Japanese 'best practice' in this area, with an emphasis upon machine turn-round times, 'right first time', 'lean manufacturing' and so on. Changes are being driven by a desire to improve competitiveness and the major manufacturers and tier one suppliers have been pressurising their own suppliers, sometimes through the use of very aggressive year on year cost-downs.

The findings of the earlier UK PARTICIPA investigations, comprising the survey findings and analysis of interview and focus group data, lead to the following interim conclusions:

- 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 were coupled with some ideas for recommendations for CVET policy and practice:

- 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 competitiveness of companies in particular districts or sectors.

Both the interim conclusions and the policy and practice recommendations are particularly relevant to supply chain learning networks and can be further illustrated by consideration of the chosen case study.

Aerospace supply chain learning network

The aerospace supply chain learning network was set up to provide opportunities for collaborative learning and knowledge development across organisations and to facilitate improved performance within and between companies involved in the supply chain. The intention was to train 'change agents' in each of the companies who would then be responsible for learning, development and process improvement in their own organisations. The initial training and continuing technical support was provided by specialist tutors (Master Engineers) and learning support tutors (from the Open University) who were experienced at supporting distance learners in a distributed network.

The training was designed to generate organisational and inter-organisational learning as well as individual learning and development. In particular, the focus was upon supporting

SMEs in adapting to demands for increasing knowledge as a foundation for supply chain relationships, and in extending their adaptive and innovative capabilities. The intention therefore was to stimulate economic innovation in SMEs through innovative learning. The learning network was process oriented, comprising workplace teams of operators, specialists and managers, and linked eight suppliers to the lead company (a Tier One supplier of complete aerospace systems). They functioned through learning about the core tools and skills needed to improve performance. Teams undertook 'hands-on' learning by doing, which involved problem identification and the development and testing of solutions. The companies were expected to use measurement and improvement tools designed to meet the increasingly demanding quality, cost and delivery standards of customers. It was recognised that this could also involve cultural change as the companies sought to adapt to an increasingly competitive environment.

In the network, the lead company persuaded their suppliers to identify key individuals with central responsibility for shop floor innovation in supply management. These people, nominated as 'change agents', also became Open University students, following a course on Stimulating Competitiveness in Supply Chains. They were invited to a series of one week, intensive workshops at the lead company, led by the engineering tutor together with help from the learning support tutor. In the four week intervals between workshops, the change agents applied what they had learned in a practical context in their own companies. They kept in touch with other students via a computer conferencing system and undertook assignments designed to encourage them to reflect on their learning and the implications of applying what they had learned. The learning support tutor offered considerable educational support where necessary and marked the students' assignments.

As the course progressed, the focus shifted from work in individual companies to collaborative learning across the network of participating companies. There are obvious advantages of such a programme for the tier one company that sees rapid benefits in terms of the cost, quality and delivery performance of suppliers. There are also competitive advantages for all the companies in the network. Students also gain as individual learners. Overall, the expectation is that the future competitiveness of the companies will be enhanced, whether they are working with this particular customer or not.

Company A

Company A is a relatively small specialist engineering company that produces specialist parts for aircraft and nuclear submarines. The company employs 60 people and technically qualified workers play a key role in the company. The person most directly involved in the "change agent" training has for the last six years been the chief inspector at the company. Previously he worked as an inspector at the lead company in the supply chain network for 10 years.

The main benefits and highlights from the 'change agent' training and subsequent application of what has been learned involved:

"the improvements have included significantly better Overall Equipment Efficiency (OEE); weekly efficiency monitoring; reduced set-up times (90 minutes to 30 minutes because it has been possible to pre-set machines); the introduction of a kanban system with access straight into production line of lead company in the supply chain network - we receive a fax and five days later they have the parts. The value stream mapping has proved useful, particularly in being able to concentrate our efforts on upon loss-making jobs and find out in which areas we have problems and why. For example, we focused upon one support bracket behind the propeller that often warped - this was because of a heat treatment distortion. One example of focusing upon a problem was the amount of time team leaders were spending on rectification of fabrication problems - analysis revealed the damage was being caused when the products were moved within the factory, so we now have special foam boxes to transport products. The problems can be revealed by inspection or through problems with tooling - one key question is then what it costs not to take action. It is also useful to involve more people in the work of the improvement teams - it can be particularly helpful to talk to workers and team leaders. On the other hand, we are a small company so we are conscious of the human resources being used."

Problems were encountered, however.

"The main problem was to get management to accept that these approaches were valuable in the first year. They need the OEE evidence that the approach is working. So in the first year I was a bit of a one man band - I kept getting knocked down, but I kept coming back. Improvement days, continuous improvement plans, monthly meetings have all been useful in convincing management one peg at a time. There have been no problems with the shop floor. Balancing the two roles (inspection and improvement) has been a challenge as I tend to spend one or two days a week on 'problem jobs'.'

The technical workers quickly appreciated the value of the new techniques and were willing to learn new ways of working. In fact it was harder to convince the management: "at monthly meetings I would produce charts and evidence of the improvements. For example, in our non-destructive testing unit we had a first-in first-out system, but we have adapted this through the introduction of priority cards that has resulted in a reduction in the lead time from four days to two days. I adapted the idea from the lead company in the supply chain network"' One reason for the positive response from the workers was their work was less pressured, instead of always having to respond to immediate pressures and apparent crises, the flow of work was much better planned: "we have continuous roll-out plans, whereas previously we were responding much more day to day. There is now a more regular flow to the work: with fewer large batches."

Sustaining long-term continuous improvement could be difficult, but the 'change agent' felt that at least it should be possible to build on what had already been achieved:

"The visual aid charts have played a role in convincing the directors as has the change in the relations with our major customer that takes 80% of our work. Previously we were rated a category C supplier, but now we are category A and our products go straight into their lines as a result of increased quality and we are meeting targets of cost reductions of 30%. We use Pareto analysis, action plans and data monitoring to ensure we stay on track."

Involvement in the 'change agent' training led to personal development for the chief inspector:

"I have become more interested in problem solving, and I have involved departmental managers more. The problem is I have my own job to do as well, but people appreciate the value of this so I can get cover for my job. I still want to carry on learning and gain further qualifications, either with the Open University or maybe go down the NVQ [National Vocational Qualification] 4 route. If I want more training I will take it a step at a time to the directors, but if I want to I will continue anyway."

The training did not just lead to individual development, as one of the key aspects of the training was the need to facilitate the learning of others when cascading the approach within the company:

"I teach the approach to others regarding, for example the application of the 5Cs, and we also have a notice board for our achievements. Although I have had no formal training in helping others I am used to it, because I teach chess. The change agent training was the first formal training I had had since completing my initial five year engineering training - which reached the equivalent of A level standard."

Company B

Company B is a precision engineering company that makes specialist parts that are used in aircraft sub-assemblies and in other industrial settings. It has about 200 employees, with considerable numbers of technically qualified workers many of whom work on the shop floor.

The person most directly involved in the 'change agent' training had responsibility for personnel and business development. He had worked for the company for 20 years since leaving school. After completing his apprenticeship, he had worked on machines for two years and then switched to planning production. Then he was quality manager for seven years, before combining roles as business development and quality manager for a year, prior to being given his current job. After involvement in training at the lead company he was charged with cascading the training to employees involved in production and/or technical activities in his company.

He considered the main benefits and highlights from the 'change agent' training and subsequent application of what had been learned to include:

"success in developing people: so far 54 people have been involved in business development. There have also been improvements in communications and team ethics. The improvements have included 28% higher Overall Equipment Efficiency (OEE) (sustained for over six months); the creation of multiple manning areas where two people work five machines; and machine set-up reductions from 5 hours to 2 hours that have given us extra capacity. We have had greater management involvement at directoral level and we can now measure business performance at shop floor level. The shop floor are pleased too, because they had become frustrated that their ideas had not been taken up previously. We are also working more closely with a major customer (the lead company in the supply chain network), and we have more idea of the problems and solutions of other companies. We have been swapping development ideas: for example, about ladder racking. Personally this has given me a new lease of life and a new learning focus. It has also led to recognition in my own company."

However, introducing major changes in manufacturing processes and practices also generate problems. The main difficulties were:

> *"Negativity from some people: some with good reasons and some without. The latter 'well poisoners' can be very disruptive, so all you can do is concentrate upon the positive people. There is also the issue of time constraints: the fact that change does take time and the fact that there are no 'quick fixes' often leads to frustration."*

The 'change agent's' response to these difficulties was "to seek to educate people as to what we were trying to achieve, put much emphasis upon communication and to have my own personal objectives and mission statement." In order to sustaining medium-term continuous improvement "we are focusing upon delivery performance targets. We also have a training plan to try to ensure the momentum is maintained." Sustaining long-term continuous improvement was likely to be harder: "this becomes more difficult. We do have director support and direction, not least because the company needs the financial benefits. We do though need to give greater emphasis to training and development and we should form a dedicated performance improvement unit. We could use more people in the business improvement teams. We are looking at our own suppliers too - they are at the crux of some of our own non-delivery problems. The improvements will pay for themselves if we can sustain 80% OEE."

Company C

Company C is an aviation engineering company that company makes parts for aircraft sub-assemblies and jet engine components and has about 100 employees, 55 of whom work on the shop floor. The quality manager was the person most directly involved in the 'change agent' training. After involvement in training at the lead company he was charged with the subsequent application of what he had been learned back in his own company. All employees involved in production and/or technical activities have been involved in learning, training and development associated with the attempt to introduce processes of continuous improvement.

Many of the techniques learned in the workshops and subsequent training at the lead company were applied in company C, although some required considerable adaptation. The quality manager pointed out:

> *"the improvements themselves have included higher Overall Equipment Efficiency and the analyses have shown that many of the issues raised are common. Adapting the value stream map has proved useful, as has the use of video because it produces irrefutable facts. Indeed one worker requested the video in order to show what people in the office make me do! The shop floor workers have been really involved, because it makes their lives easier and targets become easier to achieve."*

> *"The use of the measures has been important in giving people ownership and a focus for tackling their problems. We do have an awareness of the cost of maintaining the measures too. The work with the teams has meant that management have identified a number of 'rising stars' and management have included them in management development plans. This is designed to cope with skills shortages and involves eight people [technical workers] being given one day a month training for six months."*

The diffusion of responsibility for training and implementation of these practices from management to the technical workers themselves was seen as a crucial step in getting people committed to the processes of continuous improvement: "ownership of the process is important, as is visual impact. It is also a question of delivering some improvements while managing expectations (as to the limits of what can be achieved)." Sustaining continuous improvement in the medium term is important and:

> *"involving the supervisor and the work team are crucial. So that you get a critical mass supporting the change, not just a single person. It helps if they can see 'rungs on a ladder', so that they can see where they are and what has been achieved. Of the four supervisors three have now been on the training [organised by Master Engineers]. So there are two improvement teams and a third is being established."*

In order to achieve and sustain long-term continuous improvement (CI) "the change programme needs to be viewed as a top-down imperative and a bottom-up pressure in relation to Overall Equipment Efficiency and so on." However, application of the CI processes was not unproblematic, not least because of the challenge of adapting 'flow' tools (most applicable to assembly line and similar processes) to non-flow processes. For example:

> *"the conventional value stream map would take ages to develop in our context, but we can adapt it to a product family approach. At one work centre there would be many different products, typically coming through in small batches, so it is important to look at the processes in terms of common threads. For us an order of 10 is a lot, but each component may have between 500 and 3000 features. Only 300 aircraft may have been produced, so we may have to wait 18 months before we get our next lot of 10. The average price of one of our components is £3,000 and we are working with aluminium, titanium and so on."*

Supporting learning and innovation in SMEs through participation of technical workers in continuing vocational education, training and learning: interaction between training policies and creating opportunities for significant learning experiences at work

It is too early to identify whether cultural shifts have been fully embedded, but achieving such change was one of the long-term goals of the work with the change agents in the companies. The intention of the formal part of the CVET was to encourage both formal and informal learning in the participating companies. One way to achieve this was to encourage a decentralised view of the processes of knowledge creation within the network. The focus upon SME skill needs in supply chains was the stimulus for organisational and inter-organisational learning and knowledge management across supply chains, as well as supporting individual learning. One implication of this approach is that it might be worthwhile considering a reshaping of the boundary between higher education, continuing education and training and organisational development. The underlying pedagogical idea is that there is considerable value in attempting to link processes of knowledge creation with approaches to tackling the core problems of

manufacturing practice as a means of engaging learners (in SMEs) that have traditionally been difficult for formal education and training institutions to reach.

It is also clear that innovation and learning within organisations are essentially social processes. Hence within the network particular attention was given to building relationships to support innovation that went across companies in the networks. The support for change agents was itself designed so that they would be able to support process innovations within their companies. This means that the networks offered not only a mechanism for technology and process transfer and exchange of ideas about development and practice, but also a means of supporting those interested in acting as change agents in support of development and innovation. Networks, such as the one exemplified in this case study, have the potential to grow as a general means of innovation transfer in supply chains. The network sought to give people not only access to innovative ideas, but also to give learners opportunities to shape these ideas in ways that were directly useful to them in their work. This applied particularly to the work with company change agents.

A major concern with the development of much learning in continuing vocational education and training that is supposed to support practice is that the knowledge generated is often decontextualised. This may then mean it is of relatively little use to employees in coping with many of the problems they face in practice. This potential problem in this network was overcome through focusing closely upon what the Master Engineers and those involved in the network saw as the key problems of manufacturing practice in the workplace itself. This ensured attention was given to problems and dilemmas that are central to manufacturing practice. These problems and dilemmas have significance both for individual and organisational performance. The problems are likely to contain combinations of practical concerns, organisational issues and socio-cultural problems.

The approach to process improvement using Master Engineers who ran workshops and gave practical demonstrations of how to analyse and improve work processes by following the work flow was underpinned with an inter-locking series of products that covered a range of important topics. These included workshops and support materials that examined aspects of Value Stream Mapping; Supply Chain Organisation; Team Leader Training; and so on. Details of this approach, together with case studies of their implementation are given in the DTI (1999) publication 'Quality, Cost, Delivery, seven measures for improved competitiveness in manufacturing industry'. This approach also means that employees are directly involved in processes of active knowledge creation.

This particular network also benefited from additional mechanisms for support of participants to make them more effective learners and offered support too for work-based learning as a process. The formal learner support was delivered through a system of learning support tutors and NVQ assessors, but peer support throughout the network organisation also played an important role in supporting learning and reflecting upon the learning and development that had been achieved. The substantive support for learning and development of change agents within the companies also resulted in an increase in

the capacity of those companies to support other forms of work-based learning. As some of the learning was grounded in improving manufacturing processes and practice there was little doubt that this contributed to improvements in efficiency. The competitiveness of SMEs may also have been improved insofar as a consequence of these developments the companies were able to operate more effectively within supply chains. This is particularly important as major manufacturers (including Tier 1 suppliers) are expecting greater independence in ways of working with suppliers and are expressing an increasing commitment to processes of quality training (Abreu *et al.* 2000). The number of suppliers the large companies wish to deal with has also been significantly reduced and many of these companies now explicitly grade their suppliers. Hence there is a premium upon smaller companies showing that not only do they produce quality price competitive products, but also that they are able to operate effectively within integrated supply chains.

More generally, what is of particular interest is the way that training policies are operating here. That is, formal training in process improvement techniques for technical workers are being combined with creating opportunities for the application of these processes in a collaborative manner which in turn generates significant learning experiences at work. Indeed in many cases the roles of those undergoing training were broadened, for example through participation in improvement teams, and the organisation of work itself was often changed as a direct consequence of participation in these activities.

The significance of organised learning support for learning, knowledge and competence development at work

The discussion so far raises the general question of how best to support learning at work. Eraut *et al.* (1998) highlight the importance of organised learning support for learning at work, but also draw attention to its relative rarity. This case is an example of a highly structured approach to the provision of organised learning support. On the one hand, the case may be thought to have limited generalisability because of the amount of time and other resources poured into the development and implementation of a structured system of learner support. On the other hand, it could be regarded as illustrative of the scale of the effort required if companies and individuals are serious about the implementation of significant change based upon a transformation of the relationship between working and learning. The more specific contributions to this issue are as follows:

– The involvement of Master Engineers and their established processes designed to embed performance improvements in quality, cost and delivery (with consequent promised effects on organisational effectiveness more generally) acted as a strong catalyst to galvanise the interest of companies. Once the initially narrowly focused learning approach was underway it was often (though not always) possible to broaden the interest of companies and participants in learning.
– It is relatively easy to have an immediate impact on quality, cost and delivery in companies that have been primarily concerned with immediate operational issues. In contrast the process of embedding sustained continuing improvement is much more challenging and could take years to achieve. This is not to decry the value of the process outlined here, rather just to acknowledge that in organisational terms it is the ideally the beginning of a longer-term process.

– The focus of the Master Engineers and the group of learners upon making real improvements in manufacturing practice and process at one level could fit with ideas about the collaborative creation of new knowledge. However, at another level their understanding of learning was formulaic: improvements were achieved by following a very particular approach to improvement based upon what the Master Engineers had themselves learned from Japanese Master Engineers. Hence in practice the Master Engineers themselves learned more about the processes of learning through the involvement of the Learning Support Tutors. For example, they learned more about how to link what they had been doing in terms of performance improvement to broader learning and assessment processes in the networks.
– The approach to learning through networking could be seen as an example of an active model of learning whereby learners are engaged in the creation of 'new contextualised' knowledge, not recipients of a largely passive process of knowledge transmission. This is in line with the theoretical framework developed to explain processes of organisational knowledge creation by Nonaka and colleagues (Nonaka & Takeuchi 1995; Nonaka & Konno 1998). This approach makes use of a social model of knowledge creation and transformation. The key process for genuine knowledge transformation to occur is that knowledge has to move from the individual level into wider communities of interaction that cross organisational boundaries as happened in this network. It is worth expanding upon the link between learning in the network and organisational knowledge creation in more detail.

Nonaka and Konno (1998) use the idea of *ba* as shared spaces for emerging relationships that provide a platform for advancing individual and/or collective knowledge and of generating collaborative processes that enable the transformation of that knowledge to other contexts. This fits with the approach adopted in this network, as does the idea that active involvement and collaboration in the network allows participants to transcend their particular (traditional) perspectives. In supporting people in their attempt to bring about change in manufacturing processes opportunities have to be given for practitioners to transform information from written or broadcast material into practical individual and collective knowledge. It may also be that the analytically rational world represented in learning materials may be too 'cold' for many people: they may need a richer form of engagement. The processes of socialisation, externalisation, combination and internalisation that underpin Nonaka and Takeuchi's (1995) model of dynamic knowledge conversions gives insight into why this lack of engagement may occur. It is therefore worthwhile viewing the approach of this network in the light of these processes in more detail.

Socialisation (through originating ba):

Nonaka and Konno (1998) point to the need for an originating *ba* (or space for socialisation) where individuals can share feelings, emotions, experiences and mental models. This is necessary not only to generate initial commitment (the value of which has long been recognised), but also because genuine knowledge transformation also requires a 'magic synthesis' of rationality and intuition that requires a greater depth of human engagement than just thinking. Within the network the originating *ba* occurs during the initial face to face network meetings.

Externalisation (through interacting ba):

The creation of space for active reflection by groups can be seen in the way in subsequent network meetings groups would jointly examine a range of problems commonly associated with manufacturing practice. The groups would comprise individuals with a mix of backgrounds, knowledge and capabilities. Individuals could share their own ideas and understandings (although this phase was led by a Master Engineer), and through processes of reflection and analysis, seek to generate some common understandings of how to improve manufacturing practice.

Combination (through cyber ba):

This stage involves creating space for combining the ideas generated in the previous stage with existing information about how work is organised in a particular workplace. A group would jointly examine the problems in a particular workplace of one of the SMEs. The network group would again comprise individuals with a mix of backgrounds, knowledge and capabilities. This time individual ideas and understandings would be combined through processes of discussion and analysis in order to generate shared understandings of how to improve the manufacturing process in that particular workplace. This involves the generation of new forms of explicit contextualised knowledge.

Internalisation (through exercising ba)

The exercising *ba* is a shared space to facilitate the conversion of the (newly generated) explicit knowledge into the tacit knowledge of individuals and groups. This will involve active consideration of how to apply that knowledge in different contexts and the use of strategies to support the knowledge conversion process. This was the task of the change agent, trying to embed new ways of thinking about manufacturing processes and practices in her or his particular workplace.

This approach involves the spiralling of knowledge creation and transformation through continuing cycles of socialisation, externalisation, combination and internalisation. The structure of support for learning in the network was designed to allow material and ideas to be fed into the change processes over time. The essence of the *ba* of the learning community as a whole is that it does not involve a static accumulation of different materials, documents and information, but rather when it works well it possesses the dynamism continually to create new knowledge.

This approach to the development of practice is reflective, forward-looking and dynamic and works best within a culture that acknowledges the importance of developing practice, expertise and analytical capabilities in an inter-related way so as to be able to support the generation of new forms of knowledge. Those involved in such developments need to have a continuing commitment to explore, reflect upon and improve their practice (Schön 1987). The initial key to going beyond competent practice lies in the ability to transfer skills, knowledge and understanding from one context to another (Eraut 1994). Increasingly those working in complex supply chains are expected to perform effectively when they work in teams or task groups with colleagues with different backgrounds and

different kinds of expertise. The network approach was predicated upon the idea that those engaged in particular work practices and processes have a key role to play in how new knowledge is generated and applied in practice (Engeström 1994).

An individual's knowledge of practice can itself regarded as a personal synthesis of received occupational knowledge and situational understandings, derived from experimental learning, which are capable of being further transformed through a process of critical reflection. As expertise develops, and new contexts are utilised in the performance of practice, so the processes of analysis, review and reflection can lead to the creation of new forms of knowledge (Engeström 1994). Additionally Eraut (2000) points to how people have to deal with contextual variables, such as the time available and the volume of information to be processed, that mean they have to produce appropriate responses in situations where the conditions for 'best practice' are not present. Approaches such as those adopted in the network therefore constitute an important way in which to develop contextualised knowledge of how to affect continuing practice and process improvements. These practices and processes are dependent upon the active participation of a full range of employees, with technical workers having a particularly important contribution to make.

The role of individual agency in participating in training, learning and knowledge development at work

The benefits of participation in the network to companies and for individuals performing their work roles were evident in improved organisational effectiveness. However, what personal advantages might an individual gain from participation in the network? Also how far do personal variables and attitudinal factors come into play in decisions whether to participate in the learning networks? In relation to participation it was interesting that nearly all participants in the network had taken only rarely participated in any formal continuing vocational education and training since completing their apprenticeships. However, **after** participating in the network many did express an interest in investigating ways in which they could continue their learning. So involvement in this network clearly represented a different type of learning to that previously on offer and participation in the programme of CVETL acted to change the attitudes of the participants towards learning.

This means it was structural factors (the nature of the particular provision of the combination of formal CVET and opportunities for learning at work) that were much more influential than factors associated with individual agency in the decisions whether or not to participate in CVETL opportunities associated with this network. Virtually all technical workers approached in the small SMEs expressed a willingness to participate in the improvement teams. Indeed change agents reported that managers were often more difficult to convince. This was understandable in that the focus was upon processes that were problematic for the workers. Crucially participation in the improvement activities often contributed to a transformation of the workers' learning identities: as a consequence they saw themselves as willing to engage in other learning activities in future.

One reason for this may have been the extent to which much of the assessment was formative, expressly designed to support their learning. Assessment was primarily being

used to support learning, rather than to judge the learners. There was, however, summative assessment too and final accreditation did have a role to play for some learners who were keen to have their achievements formally recognised. (Most participants were, however, interested in the process of learning and development rather than being concerned with formal recognition of their achievements). The Open University had pursued a dual track towards recognising the achievement of participants, whereby individuals could accumulate credit towards either or both National Vocational Qualification (NVQ) units or higher education credit accumulation and transfer (CATS) points. This was an interesting approach to bridging between different types of qualifications. The use of assignments that involved critical reflection, adaptability and forward thinking was a powerful developmental supplement that overcame many of the problems traditionally associated with the relatively narrow focus of National Vocational Qualifications. The network participants worked towards a post-experience Open University award or an Award in Change Management comprising up to three units at NVQ level 3 or 4. Amongst the activities in the programme was support for the development of an Accreditation of Prior Experiential Learning portfolio, which enabled some learners to gain further accreditation.

There were clear benefits to change agents and some other participants of access to recognised qualifications, accreditation of some existing skills and knowledge and opportunities for further learning and development. They also had opportunities to experience new approaches to learning based upon collaboration and active reflection, with the consequence that participants were more likely to recognise that many of their skills were transferable and could be used in a variety of contexts. Indeed attainments in learning could be formally recognised if they were written up in a learner's portfolio and/or if an individual completed all or some of the four written assignments.

The assignments helped students pull their learning together: for example, they could reflect upon how they might transfer what they had learned in the Master Engineer real-time workshops about improvements to practice and process to other contexts. The assignments also provided NVQ evidence as well as opportunities for learners to reflect upon their own learning, and were a valuable part of the personal development associated with working on the programme as a whole. The assignments were used by some employees as supporting evidence in their company appraisal processes. The assignments therefore helped learning become more portable or transferable. [The downside to this process is that some employees were not enamoured of having to write up what they had learned in assignments. For them the spectre was not one of lifelong learning, but of lifelong homework!]

Assignments give clear evidence of the effect on the organisation of individual learning, but a question is raised whether there is a need to recognise the efforts of a team. One argument is that this is especially necessary as the team is the key link if there is to be a continuing commitment to learning in the form of attempts to sustain continuing improvement and support the creation of new knowledge. The team can also be a vehicle for innovation and the development of adaptability, evidenced by the ability to perform

effectively in a range of contexts. The goal is to get the team as a whole to be forward looking and proactive.

Unusually those involved in this programme can demonstrate improvements in aspects of company performance and improvements in their own individual learning. The latter are evidenced through reflections upon work and learning in assignments and portfolios and in the increasing quality of the assignments themselves, as evidenced by the ability to communicate effectively in writing, to be self-reflective and so on. There is value in portfolio building being coupled with active reflection upon what has been achieved with the tutor and other students, rather than being a passive and often dispiriting individual process of just documenting what you already know (Grugulis 2000).

Concluding discussion

One key question is how generalisable are the findings from this case study. The first comment to make is that the level of provision of organised learning support was high, with assessors and tutors offering considerable individual as well as group support. There is little doubt that a reduced level of learning support would result in far fewer employees becoming committed learners. There is also a paradox in that some of the initial enthusiasm for learning comes precisely because the learning does not seem like learning ('something hard that involves you in doing things you would not do if left to your own devices'). That is, there is a step change involved in building upon the learning attained from well-defined Master Engineer processes that focus upon improving organisational performance. That learning is initially limited in terms of its scope and more in-depth learning is by its very nature more challenging.

One major problem faced in trying to generate interest of SMEs in learning and development (and in generating small business growth) lies with the career motivations and personal expectations of individual owners and managers. Many small firms adopt practices that are antithetical to efficiency and growth (Gray 1993). Indeed the most common small business ambition is for independence and autonomy rather than profits and growth (Gray 1998). Hence it is important not to understate the extent of learning support (and in some cases a cultural shift) that would be required to make this approach applicable in a range of other settings. It is also clear that the companies had to commit to organisational change and development **before** individual employees and teams could participate in this combination of CVETL activities. If individuals attended 'lean manufacturing' workshops or similar events without a company commitment to collaborative process improvement then their whole learning experience would be very different.

On the other hand, this particular example was very successful in its context. Hence it is worthwhile drawing out four lessons for supporting learning in SMEs. First, it is clear that the focus upon improving organisational performance contributed to improving commitment to learning at work of both companies and individuals that have traditionally been hard to reach. Examples of demonstrable improvements in quality, cost and delivery made the link between learning and performance transparent. The support of large companies as lead organisations in supply systems was significant too. SMEs were much

readier to take part in an initiative that had the explicit approbation of a major customer than if they were approached directly by providers of education and training. The participation of major manufacturers (including Tier 1 suppliers) in networks proved to be powerful initial 'hooks' to engage SMEs in learning activities.

Second, once committed and after overcoming initial suspicions of learning and working with staff from other companies, there were considerable benefits from collaborative learning. The networks involving change agents from different companies working together meant that, in addition to transfer of 'good practice', they could get a 'feel' for the capabilities of the other companies and this opened up possibilities for greater collaboration (for example, in joint bidding for contracts). The technical networks could also be supported by other networks that engaged senior staff from companies in thinking collaboratively and strategically about supply chain issues. In both types of networks there was value in learning as a member of a group, including from others with a variety of backgrounds - with mutual learning across hierarchical levels as well as between horizontally between departments and companies.

Third, there was a formal learning framework in the initial stages and a continuing structure of learning support - it was not just a question of bringing people together. The use of a wide range of learning methods helped improve commitment towards learning. These methods included: participation in production process improvement reviews and implementation; Master Engineer workshops; group discussions; assignments; portfolio-building; discussions with tutor; use of computer-mediated communications for discussions, document transfer and tutor feedback. It was important there was rapport and a good working relationships between engineer and tutor in order that technical and learning development were mutually supportive. There was a key role for the learning support tutor in helping learners build and then sustain commitment towards their learning goals. The tutor role involved providing advice, guidance and information and supporting all aspects of learning. Learners at all levels greatly appreciated the support and encouragement of tutors.

Fourth, the final stage was an attempt to move towards still more expansive learning beyond the immediate context. Many of the change agents recognised the value (and potential transferability) of the skills they were developing and this contributed to their commitment towards learning. For example, the skills required in coping with the challenges of trying to implement change involved compromise and dialogue and helped hone their communication skills. The project gave people support to help them engage in patterns of thought conducive to learning. The project gave learners generally, but especially the change agents, the time and space to engage in critical thought, self-reflection and personal development. This included opportunities for both collaborative and self-directed learning.

Overall then, the model of learning used in the network with its emphasis upon networking, knowledge creation, linking an initial focus upon performance with a progressive broadening of ideas about learning and development was particularly well suited to its context: supporting learning and development in advanced supply systems.

The model of learning for technical workers, rather than the particular details of the approach, could be transferable. If the model was underpinned by corresponding commitment of effort and resources, then it could be successfully implemented in a range of other contexts. The key lesson for PARTICIPA is perhaps that well-designed provision that integrates CVET and opportunities for substantive learning in the workplace can overcome the potential reluctance of individuals in SMEs to participate in CVETL. On the other hand, such provision does require whole-hearted commitment of the company to a process of organisational development: that too represents a substantial challenge.

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Bestelladresse:

Institut Technik & Bildung – Bibliothek
Universität Bremen
Am Fallturm 1
28359 Bremen
Fax. +49-421 / 218-4637
E-Mail: quitten@uni-bremen.de