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Report

on the implementation of the Council Resolution of 2 June 1983

concerning vocational training measures relating to

new information technologies

EUROTECNET I

(1985 - 1988)

(presented by the Commission)

Commission of the European Communities

Report on the implemention of the Council Resolution of 2nd June 1983 (OJ n° C166, 25.6.83) concerning vocational training measures relating to new information technologies

(1985 - 1988)

EUROTECNET

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PART I

B A C K G R O U N D D E V E L O P M E N T

and

K E Y R E S U L T S

1.1 The Council Resolution of 2 June 1983

The EUROTECNET programme is based on the Council Resolution of 2 June 1983 (OJ n°C 166-25.6.83, see annex I), concerning vocational training measures relating to new information technologies. This Resolution called for the launching of a Community action programme to promote the development of a common approach to the introduction of new information technologies which is simultaneously responsive to economic and technical needs and to the social effects such technologies generate. Actions would also to be undertaken by Member States which would be specially geared to answer the needs of small and medium-sized enterprises, to help unemployed young people to enter working life, to retrain skilled workers whose employment was threatened by technological change and industrial restructuring, and to retrain women wanting to re-enter the labour market. The more general aim was to inform the public about the applications and consequences of new information technologies, bearing in mind the part to be played by the social partners, and the special needs of the least-favoured regions.

Actions were called for at Community level to complement and support those undertaken by Member States. A network of demonstration projects was to be established which would be designed to encourage the transfer of experience and promising innovations and, by so doing, to enlighten Member States about the development of their own policies. While favouring these exchanges, the Community action programme would examine the development of new qualifications in the field of NITs, and involve workers and/or their representatives in the overall discussion of the vocational training consequences of introducing new technologies.

1.2 The Commission's Action Programme

On the basis of the Council Resolution, the Commission launched its "Action Programme in the Field of New Information Technologies and Vocational Training 1985-1988" in April 1985 commonly known as EUROTECNET (COM (85), 167 final). This programme implemented the basic thrusts of the Council Resolution and was designed to integrate the new information technologies and the specific skills they involve into broadly-based training programmes, so as to improve access to continued employment, and even to improve employment opportunities. In practical terms, EUROTECNET was contructed and developed based on the following :

(i) - a network of demonstration projects with a development and exploitation objective (for list of projects see annex V);
(ii) - a programme of study visits both for specialists in the field of vocational training (organised with the technical assistance of CEDEFOP), and for the persons directly responsible for each of the demonstration projects;
(iii) - a programme of concerted research dealing with key issues relevant to NIT and training;
(iv) - a series of specialised working parties to encourage exchange of experiences and distillation of knowledge among specialists;
(v) - national dissemination conferences to favour the transfer of experiences to Member States;
(vi) - round tables with trade unions and employer experts;
(vii) - general conferences and publications to inform a wider public about developments taking place within the programme.

In carrying out this programme the Commission was assisted by a group of government representatives and representatives from the social partners at European level, known as the National Policy Coordinators. The group ensured mutual feedback of information and support between Community activities and Member States policies.

1.2.1 European Social Fund

A total of 28 projects were co-funded by the Social Fund in the first phase of 70 projects. This represents 40 %.
In the second phase building up to 130 projects, 31 projects were co-funded also by the Social Fund, this time representing 24 % of the total.

1.3 THE EXECUTION OF THE PROGRAMME - KEY RESULTS

As part of the involvement of Member States is the Community programme, summary national reports were drawn up to outline the progress made by Member States on the implementation of the Council Resolution, and the interaction between Member State activities and EUROTECNET. The summary below is based on the individual reports made by Member States (the entire texts of which will be found in annex III), as well as on results emerging from other parts of the programme. The overview of the programme as seen from the Community perspective and details of individual actions are presented in Part II of this report.

1.3.1 Themes and targets groups

Some of the actions carried out by Member States under the Resolution were directly related to the network of demonstration projects and other specific aspects of the EUROTECNET programme, while others were more general in scope. As specified in the Resolution the Community measures foreseen in EUROTECNET (network of demonstration projects, research programme, exchange of vocational training experts) were intended to supplement measures in the Member States, "in view of the introduction of the new information technologies, to promote the development of a common procedure that meets industrial and technical requirements and at the same time takes into account the social effects of these technologies" (O.J. 166 of 25.6.1983, page 2).

The following were named in the working programme as priority themes of common interest :

- qualification and training requirements of small and medium-sized enterprises,
- transition of young people to working life,
- improving the employment prospects or reintegration of skilled workers,
- professional adaptation or integration of female workers.

The range of demonstration projects proposed by Member States gave a clear indication of the wide variety of issues being examined and solutions being sought to new training problems.
Particular attention was paid to the following :

- the introduction of basic training in information technology into vocational education and the further adaptation of training arrangements and basic curricula to the new information technologies;

- the training and continuing training of trainers and teachers in vocational training institutes and organisations;

- improving the coordination of supply and demand in industrial continuing training with a special emphasis on support for small and medium firms in the introduction of the new technologies;

- retraining and giving additional qualifications to persons with inadequate vocational qualifications;

- facilitating the access of women to technical professions of current and future relevance.

Most projects were selected in such a way as to cover as broad a spectrum as possible of training problems regarding techniques, branches of industry, sizes of firms, professions/jobs and target groups, and were related to the priority uses of the new information technologies. Responsibility for the projects varied

widely. Some were firms in branches of industry particularly affected by information technologies. In other cases, those responsible were training institutions for continuing vocational training. In still other cases, responsibility was assumed by a central association, e.g. for a craft sector, or vocational schools of an industrial and technical nature.

This particularly rich distribution of projects throughout Member States, and the interactive mechanisms built into the programme, created the groundwork for the development of responses to continuing vocational training problems common to all Member States in sectors such as electronics, metal-working, data processing, manufacturing and administration.

In addition to the concerns shown by the national demonstration projects, other measures taken by Member States highlighted their common preoccupation with the training and continuing training of skilled workers in the industrial, technical and commercial field (skilled workers, apprentices, technical and commercial assistants) in handling new information technologies.

Experience gained during the course of the implementation of the Resolution and the execution of the EUROTECNET programme identified a number of critical areas in which possible solutions could be developed to problems common to all Member States, particularly in relation to the following issues:

- qualifications;
- enterprises;
- disadvantaged groups;
- methodologies.

1.3.2 Qualifications

National experience showed that it was unlikely that completely new professions would spring up to any considerable extent, either in the industrial and technical sector or in the commercial and administration sector. On the other hand, because of the changes in qualification requirements and professional structures, it was at least necessary to adapt traditional training contents.

In the continuing education and training sector, there was an indication of increasingly new types of further training diplomas and further training qualifications which would be largely based on established professions.

Overall, apart from the acquisition of qualifications in the field of new information technologies, the main issue was to broaden the competence and the skills of workers in specialised fields. This was also required in view of the fact that with the greater degree of flexibility in the organization of work connected with the new information technologies, there needed to be corresponding qualifications for the personnel of the firm.

In this context, the work taking place in the Federal Republic of Germany was noteworthy.
"The new training regulations ensured, amongst other things, that not simply a limited knowledge of the system is obtained, but above all that a basic understanding of new technologies is acquired so that skilled workers and apprentices could adapt quickly and flexibly to technical change and the resulting changed work requirements. The essential training goal is independent planning, implementation and control of the activities. The newer training regulations in particular are formulated in such a way that they are sufficiently open for technical, economic and social developments and hence make up-to-date training possible in the long term.

Only when the relevant technologies have matured and proved themselves in practice as well as being sufficiently widespread in the firm should correspondingly specialised training courses in the new technologies be made compulsory, along with possible future changes in occupational or technological requirements. Otherwise the training capacity of the firms will be compromised" (Report of the FRG - see annex V).

These conclusions are also supported by the concerted research reports and the individual study brochures (see parts 2.7.5 and 2.7.9). The research showed that the need to adapt training contents for technological development was dependent on the rate of diffusion of the technology. Similarly, as regards the changing nature of qualifications for skilled workers, all of the studies examined showed a growing importance of skills described as flexibility, motivation and responsibility.

1.3.3 Enterprises

Experience in the Community showed that the use of modern technologies was still not advancing as rapidly in small and medium-sized enterprises (SME's) as it was in large firms. Here, processes of innovation came up against difficulties of internal adaptation. These were due in particular to the limited possibilities of business leadership and management. In many cases, there was a lack of time, energy and financial resources to take on, as both a manager and a worker in a small or medium firm, new requirements with a longer time horizon. Thus in the case of SME's training and continuing training in new information technologies came up more frequently against problems that these firms could not always solve with their own resources. In many cases, the training measures offered by the technology manufacturers were considered as inadequate. On the other hand, the courses offered on the free market for continuing training, did not reach most of these firms. This meant that training and continuing training in the new information technologies in SME's had increasingly to be supported by training institutions covering several firms. Here new forms of training delivery were identified as being one solution - (Computer Based Training, Interactive Video etc.) in tandem with the organisation of training consortia.

In this regard the initiatives taken in Italy should be noted, where the existing phenomenon of consortia and mutual cooperation between enterprises had been developed and where, according to the report from Italy (see annex III), training activities in the field of new technologies for SME's centred around three areas:

- Training in new management technologies for entrepreneurs and executives, which included one pilot project from the Ministry of Labour on distance learning and two projects from a private company (CNITE) and a firm specialising in the training of public and private enterprises (ANCIFAP).

- Training in factory automation, which included projects from two high level training centres (IFOA and CSEA) and the Ministry of Public Education.

- Training in computing technologies for management, with the participation of the 'Centro Polo', the ENAIP and the Ministy of Public Education.

The main characteristic of these training courses was the mixing of a computer-technological culture and of an economic-entrepreneurial culture.

The concerted research and study reports on SME's highlight many of these points also (see parts 2.7.5 and 2.7.8). These reports show the great need, particularly because of their socio-economic importance, for SME's to modernise through the new technologies. They also show that the training systems developed for SME's must take account of the unavoidable constraints and characteristics of SME's. The partnership concept is particularly recommended.

1.3.4 Disadvantaged groups

The Member States reports indicated that in spite of a clear decline in the number of young people who have not completed a vocational training course, there remained a serious need for promoting the qualification of disadvantaged young persons. In addition, the new requirements, especially those connected with new information technologies, involved the adaptation of the vocational qualifications of both employed and unemployed young people, more than half of whom had never completed any vocational training.

Through special programmes, these young people who had social or personal difficulties or gaps in their school learning were able to achieve a recognized vocational training in their firms or in vocational training institutions. For this purpose, measures were necessary which either made an additional or further qualification possible, or had a content of vocational recycling, or guaranteed that vocational qualifications already attained were maintained and improved in a lengthy period of unemployment. According to the nature of the occupation, the information technology content played an increasing role.

Quite a number of countries had taken special initiatives in this field viz:

- Belgium (B6) Training Schemes for disadvantaged at FUNOC Charleroi.
- Denmark (DK7) Information Technology Centre for young unemployed.
- United Kingdom (GB1) and France (F2) networks for young people and new technologies.

Many projects existed also especially for women, particularly to improve low skill levels, provide a degree of technological competence and help women back into employment after a period of absence.

Here the projects IRL2 and GB4 were extremely innovative but the phenomenal growth of the Alida de Jong vocational training project for women (NL5) was particularly noteworthy.

Brochures bringing out the key points for training regarding young people and regarding women have been published under the programme (see parts 2.7.6 and 2.7.7).

Two of these key points are worthy of note. The first is that a priority focus for training policies in the new technologies must be to help young people enter working life through suitable measures of training in new information technologies. This is particularly important for those young people whose previous experience of learning in school has been dogged with failure and lack of motivation and confidence to successfully follow through a course of learning and training. The second is that the return of women to work will also constitute a solution where the shortage of qualified manpower is concerned and it will allow the whole society to benefit from the talents and assets of women.

1.3.5 Methodologies

In view of the fact that projects were innovative in nature, the development and testing of new learning methods became an increasingly important part of the activities, since the trainees had to master, in a given training time, a greater volume of teaching content while attaining the best possible results. Member States also found that there was a need for more development and testing of the methods to be used by the trainers, as well as the forms of learning, with cooperation and involvement on the part of the trainees. Additional problems were caused by the increasing heterogeneity in the groups of trainees, and the conversion of jobs in the firm to such an extent that the skills and knowledge required in highly technical and automated manufacturing organizations could no longer be imparted on the spot. In such cases, there was a growing use of simulation models.

Member States indicated that qualifications covering several cognitive skills, (areas such as capacity for abstraction, capacity for solving problems, independence and capacity for coopera-

tion) could only be transmitted as part of an integrated approach to new curricula in vocational training. This called for new interactive methods of learning such as CBT, Interactive video, open learning, project methods, pilot study methods, planning games, exercices, and so on. From the multiplicity of different approaches which were tried for solving the problems of adapting on the job learning to the changed conditions and requirements, methods such as "trainee centred", "experiential", "personal effectiveness", "project method" and the "pilot study method" were the subject of model experiments.

Questions of content and of teaching method also played a significant role in model experiments in vocational schools.

Examples given were the development and testing of software suitable for use in teaching, or the use of audiovisual media for an introduction to microelectronics.

The concerted way in which France approached this area deserves to be highlighted:

The multi media programme

The competences of our training apparatus are highly developed in methods which could be characterized as traditional and which remain perfectly valid even in fields of advanced technology. However, in line with a more general concern, increasing attention is being paid to modern methods of training, in particular those allowing the development of distance teaching and of multi media tools.
There is no doubt that an awareness, and even a concern, is rapidly growing in vocational training circles in France for the development of multi media tools, and this development has been still more marked in 1988.
This phenomenon concerns both the designers and manufacturers of products of this type and the users, primarily firms.
Imperceptibly, the minimum take-off threshold has been reached, there is no doubt that a market for multi media products is in the process of formation, and this is happening in extremely varied fields of training (rare technologies, management, transverse techniques, etc.).
Taking these prospects into account, this policy can now address itself to the active and dynamic diffusion and use of these tools. From this point of view, events are happening quite rapidly, and there are more and more activities, in particular those carried out in partnership between the State and branches of industry or individual, laying the foundations for the development and use of these methods. (Report from France see annex III)

The concerted research report (see part 2.7.5) supported this approach and while calling for more comparative studies in the area concluded that considerable benefits could be derived from the new training methods. In particular, it cited the view that the new technologies can make practical many of the ideas about

flexibility and learner automomy. This research also concluded that open or distant training systems might be of great value to a number of specialised or minority groups such as ethnic populations, women, young unemployed and agricultural workers.

1.3.6 National strategies

Summary

Clearly since the adoption of the 1983 Resolution and the introduction of the EUROTECNET programme an enormous amount of work has been carried out in the formulation of operational policies and the development of programmes in new technologies. All Member States greatly increased the provision of training programmes and the range and level of the technologies.

The rapid developments which we have seen during the past few years have shown that, quite apart from the "information" aspect of the technologies generated by the use of computers, there have been other effects perhaps more fundamental, which concern partly the revolution in the organisation and methods of work and in the rationality of human behaviour, but also the reshaping of managerial structures, lifestyles and recreational activities and that account has had to be taken of all factors in which technology is determinative. The great thing is no longer to "adapt" the workforce, and consequently European enterprises, to a change which they have to undergo without their knowledge, or even against their wishes, but to endow them with the means to control the use of such instruments in accordance with deliberate aims.

The transformation of training systems with a view to the mastery and proliferation of the new technologies has been substantial over the past few years along with the recognition of the need to revitalise and re-enforce the training instruments.

Developments to date have been marked by the setting up of the tools, better forecasting of needs, better coordination of programmes, an improved response to pedagogical requirements. The groundwork has been laid in most Member States for the more active diffusion of the training required to accompany rapid technological change in the future.

The application of the June 2nd 1983 Council's Resolution has contributed to raising the level of qualifications and emphasising the need to link training activities to the technological innovation process within firms. It also created an interdependency between training and technological development which should support in a very concrete way the restructuring of European enterprises with the achievement of the Internal Market in view, and allied to the need for future vocational training to support flexibility and innovative qualifications.

EUROTECNET (through the network of demonstration projects) has been recognised in Member States as a potentially powerful agent of change in relation to training for the new technologies.

Through its research studies and activities such as National Dissemination Conferences, it helped to shape the national strategies throughout the Community. It has developed a potential to influence methods and procedures throughout the education / training system and it has provided an appropriate mechanism for re-enforcing effective links with the world of work.

In brief terms, therefore, Member States generally consider EUROTECNET to have made a useful contribution to the application of emerging technologies to the content and delivery of training.

1.4 Conclusion

The foregoing is an attempt to present in a summary way as comprehensive a picture as possible of the range of activities, publications and actions undertaken within the framework of the EUROTECNET programme.

But the programme was concerned, as the title of the first major conference in London showed, with people. The central place of the individual trainee or worker is paramount in this process.

In excess of 4,500 professionals have been directly involved with EUROTECNET as project leaders, project trainers, participants at conferences or seminars, etc.

The unknown figure is the number of young and older workers whose training and qualifications were greatly enhanced by the proliferation and propagation of superior quality technological training programmes.

The impact of EUROTECNET on vocational training systems

Even in the absence of a full and formal evaluation, the general contention and consensus is that EUROTECNET has had a positive impact on the Vocational Training systems. To begin with, the introduction of this Action Programme had itself a 'stimulating and prompting' effect on the Member States. It introduced a degree of constructive, non conflictive competition, together with a continuous process of improvement. EUROTECNET also brought about a great openness insofar as cooperation and experience sharing were the prerequisites to the programme. The network and all of its dynamic activities have contributed broadly to the propagation and proliferation of training in, for and through the technologies.

In order to evaluate and assess more precisely the impact of the 1985-88 EUROTECNET programme on vocational training priorities and programme in Member States, an evaluation survey was launched in the latter part of 1988 with the following objectives:

(i) - learn from the experiences gained in the design, development, implementation and review of the projects;
(ii) - facilitate a greater exchange of information on existing review of programmes;

(iii) - develop a cooperative review programme between ministries, policy making bodies and the various executive agencies in the Member States.

The results of the survey will be designed to have a high level of transferability across national frontiers and training systems, and to contribute to decisions about project installation, continuation, expansion, modification and certification. The survey will also contribute to the understanding of pedagogical, technological and psychological issues underlying the training processes and in so doing aid the raison d'être of EUROTECNET - full exchange of information and experiences.

The EUROTECNET model of a high standard, high technological level action programme with a very modest budget (around one million ECU a year) is itself worthy of some emphasis. It has already been mentioned that the context and environment against which EUROTECNET was originally envisaged has changed dramatically over the past four to five years. Originally the programme was seen as something of a monitoring and early warning system of technological development. This function has been greatly expanded by the ever emerging new needs in different areas and also by the wider social dimension, a phenomenon not foreseen in 1983.

In line with the flexibility built into the programme EUROTECNET has accommodated all of these changes, along with incorporating the involvement of Greece, Spain and Portugal.

As an indication of the perceived relevance of the programme, most of the National Dissemination Conferences held in 1987 and 1988 were addressed by Government Ministers, all of whom supported EUROTECNET, specifically crediting the programme with raising the awareness level of technological developments and their impact in the training fields.

PART II

C O N C L U S I O N S

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A C H A N G I N G S C E N A R I O

and

F U T U R E P E R S P E C T I V E S

2.1 A CHANGING SCENARIO

The context and environment against which the Council's Resolution was adopted in 1983 and in which the EUROTECNET programme was conceived, has changed in quite remarkable ways. When the three interrelated and interdependent factors of sociological, technological and economic issues are considered, the changes can be seen in dramatic proportions.

2.1.1 Sociological

In 1983 unemployment was rising at an alarming rate. There was grave concern at the disproportionate level of youth unemployment, and at the vulnerable position on the labour market of poorly qualified young people and other groups such as women, ethnic groups, migrants and the disabled, with the design of training policies to assist them.

The current sociological environment is in stark contrast to that of 1983 to the extent that the rise of total unemployment has been stemmed or in some cases reversed, youth unemployment (though still at a serious level) is generally confined to early unqualified school leavers, while those workers in unemployment for any length of time are tending to stay there. On the other hand women are coming back onto the labour market in greater numbers, often in part-time jobs.

2.1.2 Technological

Whereas certain "new" technologies were relatively well established in 1983, e.g. EDP, CNC, Simple Automated Robotics and Word Processing, the general view was that problems associated with technology would be greatly alleviated if the workforce and indeed the citizenry of Europe were made 'computer literate' (a term without universal definition).

In 1983 the notion of preparing the European workforce for technological development and getting it to accept these advances was the all embracing objective. This was a highly commendable aspiration and whereas at the time the rate of growth and pervasion of the technologies was beginning to be grasped, the extent and volume of the changes was not, nor could they be given the exponential rate of change.

For example in June 1983 IBM launched its MS-DOS PC as its entry to the personal computer market. When IBM ceased production of this PC in February 1988, (IBM 'clones' had taken over the market which IBM had built up) more than 35 million units had been sold.

The telefax did not exist commercially in 1983, now it is part of standard office equipment. In manufacturing the use of robots CNC and computerised automation is coming to be standard practice.

Similarly, the effects and applications of the new developments in other areas were not envisaged, from the tertiary sector (banking and insurance, fast food) through manufacturing, to the primary and secondary food production (biotechnology).

In the information technology field itself, developments in the areas of Artificial Intelligence (AI) and expert systems are also of the type which would not have been envisaged a number of years ago. AI and expert systems have already given rise to new and easier ways to use programming languages.

2.1.3 Economic

In 1983 the long awaited economic recovery began. But still most economies were stagnant. Low, zero or negative growth was being recorded e.g. FRG + 1 %, France 0, Italy -1.8 %.
Inflation had begun to be brought under control and was down to 8 % from its 1982 level of 14.5 %.

Notwithstanding the fact that unemployment continued to rise (9 % and rising at year end) economic strategies of austerity were being followed.

Since 1983 economic growth has continued in stronger terms. All Member states are experiencing positive growth with the European average up almost fourfold from 0.6 % in 1983 to 2.3 % in 1987, with a similar level predicted for 1988. Inflation has further fallen to a 3.2 % EC average in 1987. In the intervening years Spain and Portugal have become full members of the Community and the general environment is both positive and optimistic. The Internal Market is now the main focus. The whole process now underway of achieving the Single Market objective by 1992 should be further facilitated by the more dynamic growth brought about by the overall economic strategy and therefore contribute to the enhancement of the social dimension. This is in marked contrast to 1983, when both European Council meetings were dominated by issues of currency realignment and UK rebates.

2.1.4 The EC Perspective

At the end of 1983, at EC Commission level, a range of policy and action programmes were proposed aimed at increasing Europe's competence and self sufficiency in R & D of the new technologies, in investments in the new technologies, in the application of the new technologies and in Vocational Education and Training of the new technologies.

While unemployment still remains a common concern, current priorities no longer focus exclusively on "employment prospects" resulting from the introduction of new technologies, but on preparing European economies and especially their enterprises to the new conditions of competitiveness in an information society, and to the perspective of the completion of the Internal Market after 1992. A more positive attitude towards the economic prospect exists which implies considering training as an "economic investment" rather than a social cost. The way EUROTECNET has been looking at training problems has therefore adapted to these changes through the years.

In the future the way in which qualifications are viewed within the Internal Market is bound to change. The joint position adopted by the Council in June 1988 on the mutual recognition of vocational training qualifications to be followed by the eventual adoption of the Directive, will contribute greatly to developing the European value of higher education diplomas, and the programme on the comparability of vocational training qualifications will enable greater transparency regarding qualifications for skilled workers in particular sectors. More and more people will be examining the currrency of their qualifications in the Common Market: EUROTECNET can contribute to this process as regards qualifications with an increasingly technological content.

2.1.5 The Problem of the Target Groups

In the early 1980's much emphasis was placed in identifying vulnerable categories of people who would have difficulties in coping with economic and technological change. These concerns were reflected in the 1983 Council Resolution with its focus on the young unemployed, women re-entering the labour market, older skilled workers and the workforce of SME's.

Concentrating on the needs of specific groups is an approach which has given rise to the setting up of discrete networks under, for example the PETRA programme on the vocational training of young people and their preparation for adult and working life (Council Decision of 1.12. 1987, OJ n° L346, 10.12.1987) and under the IRIS network of demonstration projects for the vocational training of women (following on from the Commission Recommendation on the Vocational Training of Women of 24.11.1988, OJ n° L342, 4.12.1987). These initiatives and others in the field of vocational training will be taking account more and more of the technological dimension to training.

Particular mention should also be made of the manifestly positive impact new technologies have had on the lives of many disabled people, including many children. The 1980's have been marked by the exciting development of many services enabling greater autonomy, independence and self-esteem for the disabled, not the least of which are special teaching devices where the power of computers is harnessed to help the disabled to learn and to communicate.

Many actions to help the vocational training of disabled persons are incorporated into the Community HELIOS programme, on the social and economic integration of disabled people in society, and adopted by the Council in April 1988.

In general terms, though, training needs related to New technologies are much more universal than previously, and while it is important to be aware of the inequalities that their introduction could generate on the labour market and the continuing problems of particular groups, the Community objective must be to create an awareness that all members of the active population will be called upon to cope with technological change and therefore require the competences and skills to do so.

2.1.6 New ideas about Information Technologies

Most recent developments in the accelerating pace of progress and innovation made it outdated and irrelevant to continue considering new technologies in the limited sense of "information" technologies. Vocational training today should be considered within the broader framework of global technological change, including other technological developments (for example in communication technologies or in the area of new materials). The global term "New Technologies" should thus be preferred to the restricted NITs.

This point is very important. This is an age of rapid change and the change is all pervasive. Technological development is interreactive and interconnective, i.e. its use constitutes both a cause and an effect not just on society and the economy but also on the technology itself - forcing more change. It is similar to the principle of the multiplier effect in Economics. Technological development can be credited with much of the change in the economic structure of the traditional industries (textiles, clothing, metallurgy) from labour intensive to capital/technological intensive. No sector is excluded from the impact of technological change, and as a sign of this, the projects which most recently joined EUROTECNET cover much more diversified industrial sectors, rather than exclusively information industries.

2.2 FUTURE PERSPECTIVES

2.2.1 Perception of the Programme

The EUROTECNET programme has been well received within all Member States. Much interest was raised by its activities and methods, both among its actors and beneficiaries. One of its successes is to have created a great motivation among its participants to innovate and exchange in a field so new that only creative projects have a chance of having a lasting impact on national policies. This willingness to cooperate at the Community level represents a potential for further action which should be enhanced and exploited. This is particularly true now that the public directly or indirectly touched by the EUROTECNET programme is getting larger and larger and demands for participation in the network, or sharing its results, are rapidly increasing.

2.2.2 Internal Market - Social Dimension

During the course of the programme, developments have taken place and priorities have been highlighted which could not have been foreseen at the outset, and which have moulded EUROTECNET into a greatly different instrument than the one conceived over five years ago. The one firm conclusion which must be arrived at is that there continues to be a fundamental need for a method of enabling Member States to track and compare innovations in training for technological change. With the preparation for the Single Market uppermost in everyone's mind, results from the EUROTECNET programme will be even more in demand than hitherto. The continuation and enlargement of the programme must therefore be seen as an important pillar in the construction of the social dimension of the Internal Market.

This necessary further development of EUROTECNET is one of the several elements being put into place to enable this social dimension of the Internal Market to become a reality. Be it the new training deal for young people guaranteed by the Council in its Decision of December 1987 (the PETRA programme), the Youth for Europe programme agreed on by the Council in June 1988, the ERASMUS programme, the forthcoming proposals on the continuing training of adults in enterprises, or the progress made in the mutual recognition or comparability of qualifications - all contribute to the creation of the social dimension. On the specifically technological and training side the pioneering work undertaken in COMETT obviously comes to mind, a programme which has also been perceived to need developing and expanding further into COMETT II in view of demands and expectations. Similarly the NIT's in schools programme with its natural likely successor NEPTUNE has pinpointed the importance of mutual cooperation between Member States in the educational sphere. On the more specific R & D side the DELTA programme will help provide the next generation of high tech infrastructure for the delivery of education and training through collaborative efforts between Member States.

In the context of all these programmes the continued operation of EUROTECNET takes on its real dimension with its links to the Internal Market. The programme so far has helped the Commission to identify the needs and expectations of Member States regarding training for technological change. These needs and expectations are expressed both in terms of the social dimension to the Internal Market, and also as regards the economic dimension.

In this respect EUROTECNET has a dual role to play. Firstly it is important to ensure the effective transfer of innovative technology training both to less developed regions and to disadvantaged groups of people. Secondly the growing needs of companies, particularly smaller ones, regarding training as an economic investment for the larger market has created a role for EUROTECNET to stimulate such training via transfers of experience and joint projects. The following paragraphs outline a number of fields in which the Commission considers major pay-offs can be achieved through further collaboration in the EUROTECNET programme.

2.2.3 Impact on Vocational Training Policies and Practices

As mentioned in 1.3 above, New Information Technologies are in fact no longer "new" in 1988. The purpose of vocational training policies can therefore no longer be the adaptation of people to the introduction of NIT through training measures (reactive training), but more the preparation of people for the future challenge of an "information society" in which advanced technologies are part of the working environment of all (proactive training). These forward-looking approaches will have an impact not only on the basic formal vocational training systems, but on all measures and structures created for the continuing education and training in firms. Future policy development will have to take account of the following requirements:

- standards based, showing in clear behavioural terms the level of qualification to be aimed at;
- open access because qualifications in the new technologies should not be denied to people on the basis of social or educational status;
- comparability and equivalence are important because the person must have an idea of how the training compares to other occupations and where it fits in the hierarchy of qualifications (this also has a social dimension context);
- modularised (to allow for the twin relativities of individual aptitude and required level of technological sophistication) yet coherent and integrated;
- be geared towards learning for life rather than having this principle as a ground aspiration;
- clearly and effectively take account of changing demography;
- recognise the changes in management/worker relationship. The 'Tayloristic' organisation of work no longer applies.

2.2.4 Changes in Qualification Requirements

Observers of the world of work indicate that the main impact of new technologies on qualification requirements mainly concern behavioural or cognitive skills rather than technological knowledge. Besides the appearance of new occupations directly related to "information technologies", almost all occupations will be affected in their content. The number of occupations affected by NTs is thus much larger than expected a few years ago. New sectoral approaches to the problems of training are thus required, in order to remain close to labour market needs.

The systems for testing and certifying the new qualifications must themselves be updated. In the past those changes which proved necessary could wait until the certifying systems 'caught up'. Now this traditional process is too slow, yet people have a right to be properly served by the testing and certifying systems to ensure recognition of their achievements, and the labour market, particularly companies, needs new bench marks against which to measure recruitment, training, and skill development.

In addition there is the issue of changes in intellectual requirement. The old technologies called for high levels of psychomotor tactile skills of the manual manipulative variety. Now the requirement is for high level cognitive process skills, where in addition to the technical knowledge skills the 'higher order' skills of communication, responsibility, adaptability, working as part of a team and problem solving and decision making are also at a highly developed stage.

2.2.5 New Training Methods and Up-grading of Qualifications

Another significant part of technological evolution has been the increased use of NTs (computer and telecommunications) for training itself. One of the new questions now raised is not how to train people "in" and "for" new technologies, but "with" new technologies. Training and retraining becomes therefore quite a different undertaking. The impact of NTs on vocational training is thus twofold: on one side, they have a long term impact on vocational qualifications, changing the content of training, implying in most cases a general up-grading of qualifications and diplomas; on the other, they have a direct effect on methods. This affects the role and function of the trainers, and consequently their training.

These developments are very important. Studies to date indicate that the use of technology to deliver training is economically and educationally effective. If this is the case then the new technologies could themselves become one solution to the problem of high volume demand for training in the new technologies.

It must be kept in mind, however, that the use of the new technologies for training delivery has not been effectively evaluated on an objective basis. Its uses to date have been in further development as opposed to basic training and re-training.

The economic-educational issues of investment analysis (hardware, software, development costs, payback period, comparability with existing costs, etc) and comprehension, retention and transfer of learning (slow/fast learner, high/low IQ, motivation/stimulation, high/low complexity, etc) need to be properly analysed.

2.2.6 Training and Technological Transfers

Vocational training is unequally distributed throughout the Community. This is not only due to the discrepancies existing between national training systems, but also to the regional differences that economic and industrial developments have created. Training can thus be used as a positive instrument for favouring technological transfers between (i.e. from and to) more and less advanced regions in Europe, using NTs to facilitate these transfers, and imagining new forms of distributing training materials and skills throughout the Community in Europe-wide training network systems.

2.2.7 The Future is Now

To date EUROTECNET, with its modest resources, has had a catalytic role on training practices and policies, enabling Member States and key actors in the training field to inculcate a greater awareness of what is possible, desirable and practicable in adapting training to technological change. The programme therefore has the potential and the experience to play an increasingly decisive role over the coming years to respond to the needs of policy makers and the market place in preparing the Community for the technological, training and social dimension of the Internal Market.

The EUROTECNET programme will be followed up by a series of proposals from the Commission to develop and expand EUROTECNET, and which will be designed to build on the results of the first programme. The main objectives in the future of the programme will be firstly to improve the capacity for initial and continuing training to take account of the impact of technological changes on employment and work and qualifications and secondly to enable the impact of future technological developments on occupations and qualifications to be taken account of in the design of training and provision for new skills. To these ends innovative approaches will be stimulated in Member States, with an increasing emphasis attached to co-operation between Member States on exchanges, transfers and the joint development of new methods, with a higher priority being attached to the dissemination of good practice throughout the Community.

Such a re-inforcement of the EUROTECNET programme will require a concomitant expansion of necessary resources, a particular importance being attached in this respect to the need for a direct involvement of the European Social Fund in supporting the programme.

The resource allocation in EUROTECNET I to the main types of action undertaken indicates the following breakdown for the years 1985 - 1988 (the details of which can be found in Annex 2.8):

Thousands of ecus

Conferences	Meetings/ Seminars	Studies	Information/ Dissemination	Administration	Total
780	308	343	325	1 112	2 868

The estimated resource allocation for the follow-up programme EUROTECNET II will reflect the need for greater effort in the direction of more co-operation between Member States (with the involvement of the European Social Fund in developing transnational approaches) and towards an improved dissemination process, which will constitute an important part of the activities to be launched in the EUROTECNET II programme, the budgetary details of which are contained in the financial record accompanying the Commission's proposals to the Council.

25. 6. 83 Official Journal of the European Communities No C 166/1

I

(Information)

COUNCIL

COUNCIL RESOLUTION

of 2 June 1983

concerning vocational training measures relating to new information technologies

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to the draft resolution submitted by the Commission,

Having regard to the opinion of the European Parliament (1),

Having regard to the opinion of the Economic and Social Committee (2),

Whereas on 11 September 1979 the Council adopted a resolution on a Community action promoting micro-electronic technology (3), in which it invited the Commission to submit to it specific projects in the areas of industrial policy and further education for technicians and engineers;

Whereas the Commission forwarded to the European Council, meeting in Dublin in November 1979, a communication entitled 'European society faced with the challenge of new information technologies; a Community response'; whereas on that basis the European Council asked the Council of Ministers to study a common strategy for the development of these technologies in Europe;

Whereas in the context of an overall medium-term strategy, economic recovery depends to a considerable extent on innovation and it is therefore essential to reinforce production investment at Community level *inter alia* in the area of new information technology;

Whereas new technologies have an impact on employment and there is a need in this connection to ensure that systems of education and vocational training, both initial and continuing, take into account the potential of new technologies in such a way as to supply the labour market with the necessary skilled manpower for the future;

Whereas training in the new technologies should not be confined to a specialist élite, but should enable workers to play a more active role in their work and help to achieve equal opportunities for men and women;

Whereas, on a more general level, it is important to ensure a socially responsible approach to the control of these new technologies in a society that is experiencing radical and rapid economic, social and technological change while taking account of the needs of the least-developed regions and regions in industrial decline;

Whereas in this regard a concerted approach is desirable between public authorities and management and labour in relation to the introduction of new information technologies into undertakings; whereas, moreover, management and labour have an important part to play in the area of vocational training;

Whereas account has been taken of the deliberations of the Standing Committee on Employment at its meeting on 3 November 1981, on the basis of a communication from the Commission on 'New information technologies and social change in the areas of employment, working conditions, education and vocational training';

Whereas the European Parliament, in its resolutions of 15 and 17 September 1981 on social policy and on the repercussions of energy problems and technological developments on the level of employment, called for greater efforts by the Community to promote forms of training which take account of the micro-electronic revolution;

(1) OJ No C 161, 20. 6. 1983, p. 24.
(2) OJ No C 77, 21. 3. 1983, p. 7.
(3) OJ No C 231, 13. 9. 1979, p. 1.

Whereas the Council, in its Decision 63/266/EEC (1) laying down general principles for implementing a common vocational training policy requested the Commission to play a part in putting these principles into practice; whereas, in addition, in Council Decision 71/66/EEC of 1 February 1971 on the reform on the European Social Fund (2), amended by Decision 77/801/EEC (3), and in Regulations (EEC) No 2396/71 (4) and No 2893/77 (5), the need to start vocational training schemes aimed at facilitating the adaptation of the requirements of technical progress, included within the framework of pilot schemes, was recognized,

HAS ADOPTED THIS RESOLUTION:

I. General guidelines

Action in the vocational training field will be undertaken to promote the development of a common approach to the introduction of new information technologies which is simultaneously responsible to economic and technical needs and to the social effects such technologies generate. This action will be based on the following general guidelines:

(a) the need to develop a broadly-based form of training which provides for the acquisition of a wide range of specific skills so as to facilitate access to and continuation in employment through greater occupational mobility;

(b) the need to make workers aware of, and to introduce them to, new technologies, their application and their social consequences, in particular as regards working conditions;

(c) the need to take account of the specific training needs of managerial staff in the context of training programmes in new information technologies;

(d) the need to encourage close consultation between the competent authorities and management and labour in devising programmes of training in new information technologies;

(e) the need to incorporate the measures to be taken with regard to training in new information technologies in existing provisions for facilitating the further training of workers;

(f) the need to implement special measures to improve the employment prospects of those who are unemployed, especially young people, by including, where appropriate, units of study relating to new technologies in their training programmes, taking care to promote equal opportunities for men and women;

(g) the need for a special effort to increase the amount and improve the level of training of staff responsible for carrying out vocational training programmes in the new technologies field.

II. Actions carried out at the level of Member States

In implementing their policies on vocational training in new technologies, the Member States will give particular attention to the following areas of common concern, bearing in mind the part to be played by management and labour and the needs of areas or regions affected by industrial decline and, if necessary, of the least-favoured regions:

(a) the requirements of undertakings with regard to training in new information technologies, especially the requirements of small and medium-sized undertakings, including cooperatives where appropriate, and of large undertakings particularly affected by the application of these technologies;

(b) helping unemployed young people, in particular those whose qualifications are inadequate or unsuitable, to enter working life through suitable measures of training in new information technologies;

(c) helping skilled workers, whether or not unemployed, and particularly older workers whose employment has been or is likely to be affected by industrial restructuring, to remain in employment or to find new employment by furthering their occupational mobility;

(d) the development of qualifications in electronics and data processing;

(e) the retraining or re-entry into employment of women whose employment is threatened by the introduction of new technologies or who want to take up work again;

(f) informing the public about the applications and consequences of new information technologies as regards employment and working conditions, with the aim of creating an atmosphere favourable to the implementation of appropriate vocational training measures in these technologies.

(1) OJ No 63, 20. 4. 1963, p. 1338/63.
(2) OJ No L 28, 4. 2. 1971, p. 15.
(3) OJ No L 337, 27. 12. 1977, p. 8.
(4) OJ No L 249, 10. 11. 1971, p. 54.
(5) OJ No L 337, 27. 12. 1977, p. 1.

III. Actions carried out at Community level

In order to complement and support action by Member States:

(a) the Commission is requested to implement, in the light of proposals from the Member States and in cooperation with the latter, a network of demonstration projects designed to encourage the transfer of experience and promising innovations and, by so doing, to enlighten Member States about the development of their policies.

The principal features of the demonstration projects and the way in which they are to be implemented will be determined in collaboration with the Member States, in accordance with the guidelines in this resolution and taking the proposals submitted by the Commission into consideration, for a period of five years, the first year, 1983, being devoted to preparatory work for the implementation of the network of demonstration projects;

(b) the Commission is requested to ensure the continuous exchange of ideas and experience resulting from both the network of demonstration projects and other initiatives taken by Member States in the areas of common interest referred to in II above, with particular attention being given to the needs of less-developed areas and regions and areas of industrial decline;

(c) the Commission is requested to include an examination of qualifications in electronics and data processing in its comparative work on vocational qualifications;

(d) the Commission is requested to make proposals to facilitate the exchange between Member States of persons responsible for vocational training in new technologies;

(e) the Commission is also requested to step up its efforts to involve workers and/or their representatives in the process of introducing new technologies into an undertaking or establishment, particularly as regards vocational training, taking full account of existing practices and systems in the Member States.

IV.

The Council will examine the progress made with implementation of this resolution and the results obtained, on the basis of an interim report and a final report to be submitted to it by the Commission before 1 January 1986 and 1 July 1988 respectively.

V.

Community financing for the initiatives referred to in III will be decided on within the framework of the budgetary procedure, and in accordance with the commitments entered into by the Council. Community financing of the demonstration projects referred to in III (a) will be in accordance with the financing capacity and rules of the Social Fund.

Annex II

OVERVIEW OF ACTIVITIES

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O V E R V I E W O F A C T I V I T I E S

II.0 Since the activities carried out under EUROTECNET were all designed to contribute to the stimulation and the dynamics of the programme, each event organised and every publication produced served one or more of the aims of the programmes.

A graphic illustration of the structure of EUROTECNET is shown overleaf but the following is a list in chronological order of the key actions.

June 1983
- Adoption of the Council Resolution (OJ n°C 166-25.6.83)

1984

April 1985
- Preparation and adoption of the Work Programme (COM (85) 167 final)

May

December 1985
- Formation of National Policy Coordinators (N.P.C.) group (see annex IV)
- Selection of demonstration projects
- Creation of a network of demonstration projects
- Meeting of heads of projects

1986
- Production and distribution of first compendium (70 projects)
- National conferences to link together projects primarily at Member State level and to begin the network process
- Launch of Concerted Research Programme
- Major workshop in Brussels of project directors and NPC's (June)
- Conference/Exhibition "People and Technology", November 25-27, London
- Launching of the interproject visits programme (IPV)
- NPC meetings
- Formation of the animators group
- Newsletter (EUROTECNET News N° 1 and 2)

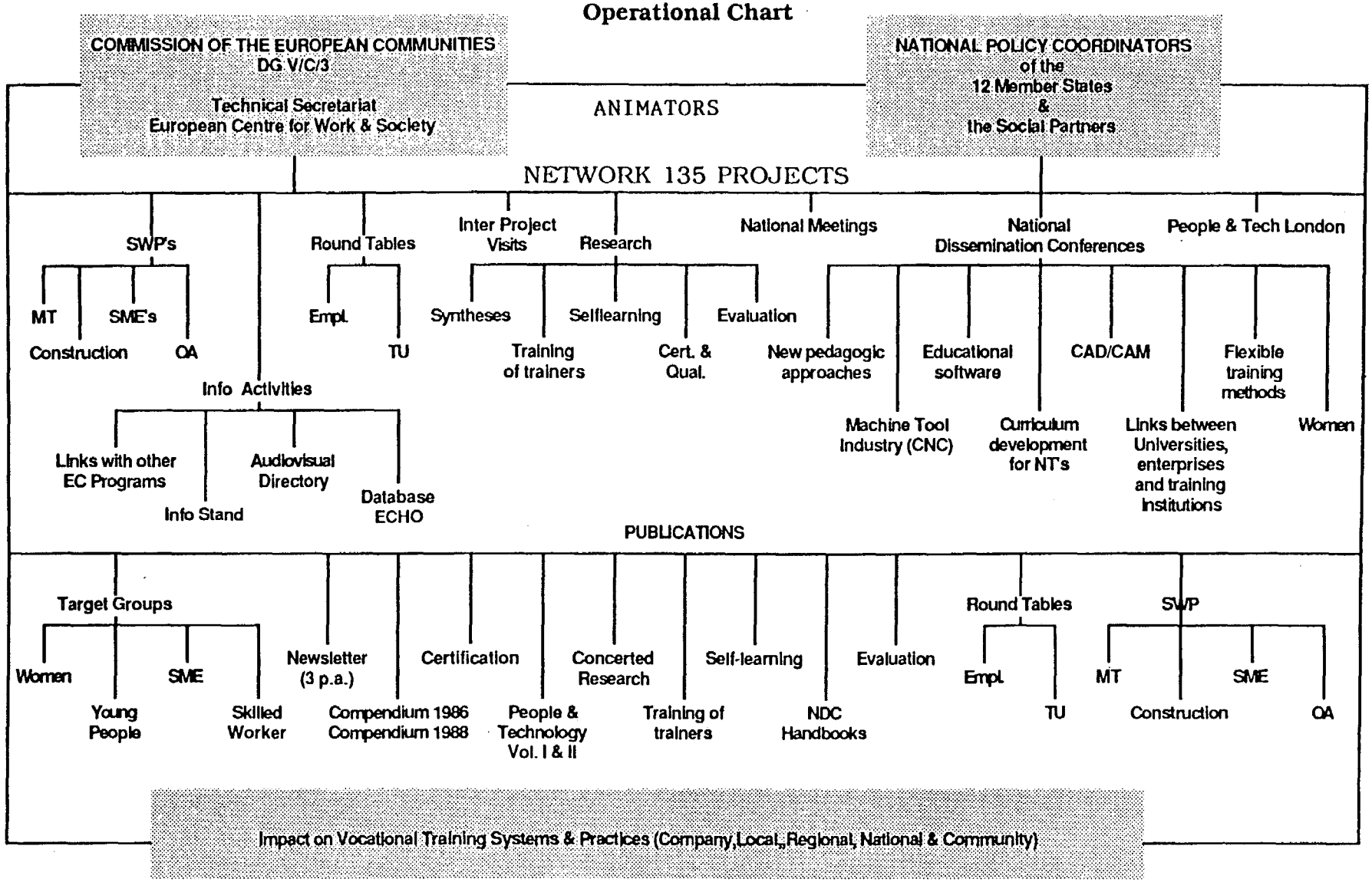
1987
- . National Field visits by the EUROTECNET team
- . Extension of the network (Spain, Portugal, Greece, Construction Sector)
- . IPV: 30 visits made by project leaders
- . Study on the "Training of Trainers"
- . Study on "Assessment and Certification of Qualifications"
- . Establishment of the database of demonstration projects based on completed questionnaires
- . Design and construction of an information stand
- . NPC meetings
- . Animators meetings
- . National Dissemination Conferences
- . Specialised Working Parties (Machine-Tool Industry and Small and Medium-sized Enterprises)
- . Several publications and newsletter (EUROTECNET News N° 3, 4, and 5) (see 2.7)

1988
- . New version of the compendium (135 projects)
- . IPV: relaunching of the programme
- . Enquiry on audio-visual means
- . Database online via ECHO
- . Enquiry on "Evaluation of projects"
- . Enquiry on "Self-learning"
- . NPC meetings
- . Animators meetings
- . National Dissemination Conferences
- . Round Tables (with social partners)
- . Specialised Working Parties (Office Automation and Construction Sector)
- . Several publications and newsletter (EUROTECNET News N° 6, 7 and 8) (see 2.7)

N.B.: Database interrogation and interproject communication took place on a continuous basis.

EuroTecneT

Operational Chart



LEGEND:

SWP = Specialised Working Party
MT = Machine-Tool
SME = Small and Medium-Sized Enterprises
OA = Office Automation

Empl. = Employers
TU = Trade Unions
CAD = Computer Aided Desing
CAM = Computer Aided Manufacturing
NDC = National Dissemination Conference

ELABORATION OF ACTION

An elaboration of these major aspects of the programme is as follows:

II.1 The establishment of a network of demonstration projects.

These demonstration projects were proposed by national governments on the basis of a questionnaire prepared by the Commission. Selection criteria ensured a reasonable cross section of innovative training approaches at local, Member State and European Community levels. At the end of 1985 a network of 70 demonstration projects was set up in nine Member States, (Belgium, Denmark, Germany, France, Italy, Luxembourg, Netherlands and the United Kingdom). The activities of the network were based on three main goals:

II.1.1 An improvement goal: i.e. building on prior achievements, including extension of the network, further in-depth research etc;

II.1.2 A transfer goal; i.e. "geographic transfer" (between countries), and "sectoral transfer" (between training institutions and companies in a certain number of priority fields);

II.1.3 A multiplying and opening goal; i.e. focus on the external influence of the network and the possible impact of pilot experiments on vocational training systems in the Member States.

At the beginning of 1987 the EUROTECNET team visited the twelve Member States to update the existing network of demonstration projects; to determine national priority themes; to investigate the role of the social partners and to discuss the proposals for 1987-1988. In addition, a number of the demonstration projects were visited and appraised.

In April 1987 the network was reviewed and extended to include demonstration projects from Greece, Spain and Portugal.

A sectoral dimension was also added, by including innovatory technology training projects from the construction sector. These projects were selected with the joint cooperation of the social partners of the construction industry at European level, and as such constituted a practical demonstration of the European social dialogue in the training field.

In its final format, the network consisted of 135 demonstration projets in the twelve Member States. In April 1986 a Compendium was published which provided descriptive information for each of the 70 demonstration projects. A second Compendium with summary descriptions of the 135 demonstration projects

was published in English in February 1988 and in French in July 1988 and serves as a reference book for the EUROTECNET network along with the online facility provided through ECHO (see 2.5) (see annex V for a summary table of the projects).

II.2 The EUROTECNET interproject visits programme.

The main purposes of the interproject visits programme were:

II.2.1 - to enable practitioners from the demonstration projects to exchange first hand information on objectives, methods, experiences and results of similar projects in other Member States and to achieve a more direct exchange of information and sharing of experiences among demonstration projects;

II.2.2 - to improve knowledge of the methods of introduction and evaluation of new information technologies in the European Community, and to feed the information-stream on innovatory actions in the field of new information technologies and vocational training at Community level.

In this way a fund of knowledge and expertise on training and qualifications, which would foster the development of joint evaluation criteria and contribute to the positive exploitation of the results of individual projects, was built up at Community level.

II.2.3 In practical terms, one person from each demonstration project included in EUROTECNET was given the opportunity of visiting one (or more) demonstration project(s) in (an)other Member State(s) involved in a similar area of work. A high degree of reciprocity was required in that participation in a visit to another country implied a willingness to host a similar visit from a representative of other demonstration projects. At the end of the visit a short report was drawn up giving personal impression of the project visited, learning points related to the participants own project, and an evaluation of methods.

By the beginning of 1987, 30 of the first scheduled 70 interproject visits had taken place, and by the end of 1988 the remaining demonstration project leaders had had the opportunity of participating in the programme, although many were not in a position to do so. The Commission would have preferred a greater level of participation in the IPV programme, and it will be evaluating how to improve the operation in order to achieve a more desirable level of exchange and visits.

II.2.4 Community Programme of study visits for Vocational Training Specialists

Part of the EUROTECNET programme was devoted to enabling vocational training specialists to participate in short-stay study visits, in other Member States to improve their knowledge about vocational training systems and changes brought about by technological change. For purposes of efficiency and cost-

effectiveness this aspect of the programme was brought under the umbrella of the study visits programme managed on the Commission's behalf by CEDEFOP.

These study visits are organised in cooperation with National Liaison Officers in each Member State. The programme provides for the organisation of short visits (five days) for each group of experts coming from the individual Member States. The visits focus on a series of preselected subjects strictly linked with priority Community subjects.

To link in with the EUROTECNET programme the theme of training for technological change has continuously formed one of the subjects of such study visits, along with other priority themes such as training and youth employment, modernisation of enterprises, training in agriculture. Over recent years a large proportion has been devoted to training for technological change, representing 50 % in 1986, 67 % in 1987 and a growing proportion still in 1988.

To participate in the programme interested parties submit an application form to the National Liaison Officer of their country. Those selected as participants receive a grant from CEDEFOP to cover travel and subsistence expenses. After the visits, participants draw up a report. A selection of the more interesting comments and opinions are published as "Travel Notes" which are available free of charge from CEDEFOP on request.

II.3 Research

A programme of concerted research was built around a certain number of key themes and specific aspects of vocational training linked to new information technologies. These enquiries were carried out as studies.

In 1986:

II.3.1 - New Occupations and Sectors of Activity, a study carried out by the Fraunhofer Institute in Stuttgart (D) on "identifying changes in families of occupations and the consequences for training brought about by technological change".

II.3.2 - The Regional and Local Management of Human Resources in the framework of forward looking labour management, a study carried out by ISFOL in Rome (I) on the fact that "Community action should contribute to a better understanding of the interrelationships between local and regional development under the impact of new information technologies, on the one hand, and the development of related training policies, on the other hand".

II.3.3 - The development of vocational training in small and medium-sized undertakings, a study carried out by the ADEP (Agence Nationale pour le Développement de l'Education Permanente) in Noisy-le-Grand (F) on "the development of in-firm integrated schemes aimed both at retraining older workers and recruiting young people into linked work and training schemes".

II.3.4 - The development of individualised training, open learning and modular training systems, a study carried out by the CET (Council for Education Technology, now National Council for Educational Technology) in London (UK) on "the identification of potentialities as well as the conditions required for setting up distance-training schemes based on new information and communication technologies".

The synthesis of these studies was published in July 1988.

The general aim of these studies was to take stock of the practices in the Member States in the fields in question and on this basis to draw up proposals for a Community Programme of development, experimentation and exchanges.

In 1987 and 1988:

II.3.5 - "The Training of Trainers", was the priority theme of a study based largely on the findings in the network, one of the conclusion arrived at being that:

"Due to rapid scientific changes and the development of expertise, particularly in the field of new information technologies, related professions and qualifications change with equal rapidity. This evolution and the crisis on the labour market have led to a transformation in the training system as a whole: demands for high quality vocational training are increasing and the scope of training possibilities offered is becoming broader. The training and retraining of trainers is, in this situation, extremely important."

The results of this study were published in the latter half of 1988.

II.3.6 - "The Assessment and Certification of Training and Work Experience," a study carried out by the (EIESP) European Institute of Education and Social Policy in Paris.

The purpose of this study was to undertake the drawing up of analytical dossiers on the assessment and certification of training and work experience in the overall framework of EUROTECNET. The results of this study were published in the latter half of 1988.

II.4 **An enquiry on audio-visual means within the EUROTECNET network.**

The main objective of the enquiry was:

(i) - to list the audio-visual products available and identify those which lent themselves to multilingual adaptation for use in transnational and crossborder cooperation schemes,

(ii) - to list those areas in which joint audio-visual products could be developed.

The work resulted in:

II.4.1 - a directory of existing audio-visual material with details of critical information regarding language, compatibility, etc.

II.4.2 - information on parties interested in joint or collaborative arrangements and on production capacities.

II.4.3 - an indication of audio-visual training material requirements in the New Information Technologies/New Electronic Technologies within the Member States.

The main information was collected through the completion of a questionnaire. The final results of this enquiry were published in Autumn 1988, one of the key conclusions being the proposal to gather copies of all the audio visual materials together at one central point which would act as a clearing house or brokerage agency.

II.5 Establishment of a EUROTECNET database and the construction of a EUROTECNET stand.

These were two major activities in 1987. The elaboration of a EUROTECNET database regrouped the demonstration projects in the field of new information technologies and vocational training all over Europe, starting with the EUROTECNET demonstration projects. A questionnaire in the main Community languages was sent out in which special attention was given to the training of trainers and certification as well as to links with other Commission action programmes.

The main objectives of the database were to:

(i) - establish a rapid information system;

(ii) - have an instrument for analysis of experiences gained within the network;

(iii) - enable Member States to set up transfer operations;

(iv) - provide technical assistance to all demonstration projects listed in order to stimulate the necessary exchange of information.

The EUROTECNET database became operational in October 1987, and it was put online for public access to the Commission's ECHO (European Community Host Organisation) in Luxembourg in the Summer of 1988 to complement the information contained in the compendium of projects. Member States and other interested parties also had the opportunity of acquiring off-line copies of the database for their own use.

In 1987 a portable information stand was designed and constructed for use at all EUROTECNET-related events as a means of publicising the programme and its products. The purpose of the stand was to encourage people to use information from the EUROTECNET network as efficiently as possible.

II.6 Transfer actions - Dissemination and diffusion

Tranfer actions consisted of a series of National Dissemination Conferences, a major European Conference, Specialised Working Parties, National Meetings, NPC Meetings and Animators Meetings.

II.6.1 National meetings

In order to launch the overall EUROTECNET programme national meetings took place in the ten Member States during 1986. These national meetings focussed on three main points:

(i) - the relationship between the demonstration projects and national priorities;
(ii) - the relationship between the demonstration projects and the European Communities expectations;
(iii) - specific problems related to new information technology training in view of a large EUROTECNET workshop.

II.6.2 National Policy Coordinators Meetings

In order to directly involve the Member States and advise the Commission on the development of EUROTECNET, National Policy Coordinators were nominated by the national authorities in the 12 Member States (mostly selected from the Ministries of Social Affairs and Employment, and Education and Sciences) (see annex III). Representatives of the social partners at European level are also invited to NPC meetings.

Time-table of National Policy Coordinators' meetings:

September 10-11 1985
January 28 1986
March 10 1986
October 15 1986
February 20 1987
July 8 1987
November 13 1987
March 10-11 1988
July 7 1988
November 8-9 1988

II.6.3 Meetings of Animators

In order to create an informal advisory and consultancy facility made up of strongly motivated non-formally involved persons in EUROTECNET, a "group of animators" was established in April 1987.

Time-table of Animators meetings:

April 28-29 1987
September 24-25 1987
February 25-26 1988
September 15-16 1988
February 2-3 1989

II.6.4 Workshop, June 1986

On June 25-26 1986 a EUROTECNET workshop was organised in Brussels, in order to acquaint the demonstration project leaders, national policy coordinators, animators and members of the EUROTECNET team with each other to allow for the exchange of information and experiences, and lay the ground work for cooperation and the development of the programme.

II.6.5 Conference "People and Technology", November 25-27 1986, London

The first phase of EUROTECNET was rounded off in London in November 1986 with a Conference and Exhibition attended by 1,100 conference delegates, and further 2,000 visitors to the exhibition.

This major conference "People and Technology - Investing in Training for Europe's Future" took place in London, on 25-27th November 1986. Held during the United Kingdom's term of Presidency of the Council of Ministers, the conference and accompanying exhibition were co-sponsored by the Commission of the European Communities and the UK Manpower Services Commission (now Department of Employment's Training Agency)

It provided an opportunity to underline the importance of human resources as a key factor in the economic and social development of the Community.

The major themes discussed during the course of the conference were the adaptation of training policies and practices to take account of :

(a) utilising new technologies for improved productivity in enterprises, and
(b) enabling improved access to technology training for disadvantaged groups (young, unemployed, women ...).

People and Technology was the biggest combined conference and exhibition ever launched by the European Community in the field of vocational training and proved to be a unique political, educational and commercial event, providing a major forum for the most extensive exchange of ideas, training information and techniques in the new technologies within the European Community.

The full conference reports in two volumes are referred to in 2.7.2 below.

II.6.6 National Dissemination Conferences (NDC)

The main purpose of the NDC's was to enable the EUROTECNET members, national administrations, training institutions, social partners, companies and other interested parties in the Member States to have access to experiences from other Member States and to remain informed about EUROTECNET results and products.

Each Member State organised an NDC in cooperation with the EUROTECNET team. The subject-themes selected by the respective Member States were chosen for their relevance to national priorities in the training field, as well as for their interest for the overall EUROTECNET programme.

Dates and themes of these national dissemination conferences were:

Date October 14 1987, Bonn (D)
Theme Information technologies and skills changes; results from recently terminated research projects

Date November 12 1987, Liege (B)
Theme Development of teaching materials

Date December 2 1987, Luxembourg (L)
Theme Basic Training for machine-tool industry

Date February 19 1988, Copenhagen (DK)
Theme Analysis of new qualifications and new professions

Date March 9 1988, Brussels (B)
Theme Link in research and development between universities, companies and training institutions.

Date April 4-5 1988, Rome (I)
Theme Training through innovation

Date April 21-22 1988, Athens (GR)
Theme Determination of new information technology training needs and developing requisite programmes

Date May 9 1988, Dublin (IRL)
Theme Training for the new technologies in commerce and industry

Date May 10 1988, Manchester (UK)
Theme The use of flexible training methods

Date May 19-20 1988, Annecy (F)
Theme Investing in training in small and medium-sized enterprises

Date June 24 1988, The Hague (NL)
Theme Women, work and computerisation.

Date October 24 1988, Madrid (E)
Theme Introduction to CAD/CAM and CNC in operational processes

Date December 5 1988, Lisbon (P)
Theme Integration of CAD/CAM systems in the ceramics industry.

II.6.7 Round-tables with the trade union and employer experts

The success of the Community's programme to increase the ability to respond to technological change and compete effectively in high technology activities was determined in many ways by the support and participation of employers and trade unions. The Commission was responsive to the needs and priorities of employers and trade unions within the programme, recognising also that employers and trade unions should be prepared to contribute towards improving the direction and operation of the programme.

In this respect, EUROTECNET organised in 1988 two round-tables on experiences in the industrial sector:

- one involving trade union officials responsible for new technology training activities (Kirkel (D), January 28-29 1988);

- the other involving senior managers and industrialists responsible for training in successful enterprises (London (UK), February 24-25 1988);

Reports of these two Round Tables were published in Autumn 1988.

II.6.8 Specialised Working Parties (SWP)

In order to deepen knowledge and experience on technology training developments in key sectors or areas, four specialised working parties were set up with the assistance of NPC's and the active involvement and support of CEDEFOP. This action brought together key operators in the theme areas identified who analysed the problems related to changes in qualifications and the new professional requirements, and enabled technical dossiers to be drawn up with Community added-value.

Themes selected were:

Date September 10-11 1987, Maastricht (NL)
Theme Machine-tool Industry
The main objective of this SWP was to foster knowledge of the issue of vocational training related to technological developments in the machine-tool industry.

Date October 28-30 1987, Barcelona (E)
Theme Small and Medium-sized Enterprises
The purpose was to gain insight into the problems related to training and new information tehnologies in small and medium-sized enterprises.

Date February 10-12 1988, Berlin (D) (CEDEFOP)
Theme Office Automation
The objective was to foster knowledge of the problems related to changes in qualifications and new professional requirements due to the introduction of office automation systems.

Date June 7-8 1988, Roissy-en-France (F)
Theme Construction Sector

The aim of this SWP was to consider the training and development problems and opportunities which the new technologies create within the construction sector. The meeting was fully representative of the social partners and project leaders.

II.7 Publications

Most of the actions within the programme gave rise to a published work as a means of ensuring wider dissemination of the experience gained within EUROTECNET.

II.7.1 EUROTECNET newsletter was issued three times per year (March, July and November) and appeared in English and French.

II.7.2 People and Technology: Investing in Training for Europe's Future, Volume I and II.

Volume I : Conference report (a joint EC and MSC Conference, London, November 1986) (F-E)
Smith, Janet
Published by Presses Interuniversitaires Européennes (PIE) for the EC Commission
ISBN: 90-70776-20-0

Volume II: Full texts of main speeches which were delivered at the conference (in the original language) (F-E-G)
Smith, Janet
Published by P.I.E. for the EC Commission
ISBN 90-70776-21-9

II.7.3 Compendium I : described the 70 demonstration projects comprising the network on New Information Technologies and Vocational Training (E-F).
April 1986
Published by P.I.E. for the EC Commission

II.7.4 Compendium II: described the 135 demonstration projects comprising the network on New Information Technologies and Vocational Training.
March 1988 (E), July 1988 (F)
Published by P.I.E. for EC Commission

II.7.5 Research Synthesis of existing analytical dossiers,
July 1988 (F), February 1988 (E), April 1989 (D)

II.7.6 Women and their returning to work and vocational training,
Chalude, Monique and Smeets, José
May 1988 (E), October 1988 (F)

II.7.7 Moving forward: the introduction of young people to new information technologies,
Smith, Janet
May 1988 (E), October 1988 (F)

II.7.8 Small and Medium-sized Enterprises,
Bonnafé-Pélissou, Chantal
July 1988 (E), August 1988 (F), October 1988 (Sp)

II.7.9 Skilled Workers,
Olesen, Kaj,
October 1988 (E), January 1989 (F)

II.7.10 Machine-Tool Industry, report of a workshop, Maastricht,
September 1987,
Stor, Martin and van der Wal, Willem,
February 1989 (E)

II.7.11 Small and Medium-sized Enterprises, report of a workshop,
Barcelona, October 1987,
Olle Valls, Montserrat,
(E-F-ESP) February 1989

II.7.12 Office Automation, report of a workshop, Berlin, February 1988,
Mandon, Nicole,
(F-E) February 1989

II.7.13 Reports on National Dissemination Conferences
January 1989

II.7.14 Study on "Assessment and Certification"
Jallade, Jean-Pierre
Autumn 1988

II.7.15 Study on "The Training of Trainers"
Danau, Dominique
(E) December 1988, (F) February 1989

II.7.16 Directory of training materials
November 1988

II.7.17 Reports of two Round Tables involving employer and trade unions experts
December 1988

II.7.18 In addition to the works published at European level, many Member States spontaneously published material directly relevant to the programme, particularly in connection with the organisation of national dissemination conferences and the "People and Technology" conference.

A number of demonstration videos were also produced by Member States or individual projects, highlighting their EUROTECNET involvement.

II.8 Budget

Over the period 1985-1988 the necessary budget required for the operation of the EUROTECNET programme was committed under the General Budget of the European Communities, in particular under the budget line created to enable actions in the field of vocational training to be carried out (successively budget line no. B 6331 in 1985 and 1986, B 6340 in 1987 and 1988) and under budget lines for studies (B7718 and B 6380).

The following table provides a synoptic overview of the budgetary commitment to the activities carried out under the terms of the Council Resolution on New Information Technologies and Vocational Training.

Thousands of ecus

	Conferences	Meetings/ Seminars	Studies	Information/ Dissemination	Administration	Total
1985	-	7	200	6	70	283
1986	300	15	17	33	160	525
1987	329	209	126	153	318	1 135
1988	151	77	-	133	564	925
	780	308	343	325	1 112	2 868

As has been mentioned in part 1 of the report (para 1.2.1.), towards the end of the programme the European Social Fund participated in the financing of around 24% of the demonstration projects included in the EUROTECNET network.

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BELGIUM - (French speaking)

Application of the Council Resolution of June 2 1983 -
- EUROTECNET

Aims and objectives

The aims of compulsory education are set out in the education schemes of the organizing authorities; these aims have many features in common.

They are expressed as follows in the State education scheme, in various Ministerial instructions and in most of the programmes pursuant thereto.

Teaching scheme for the man whom the education system wishes to shape:

a. a man who is competent and efficient in his professional life;
b. a man who is aware of his responsibilities in seeking his own happiness and that of his family, and in the welfare of the community to which he belongs;
c. a man who is concerned about his physical well-being and emotional balance;
d. a man capable of:
   * freely taking decisions and accepting the consequences of a conscious and clear commitment;
   * accepting rules of conduct, abiding by them and living according to them in terms of certain values;
   * participating in the life of the community and the culture of society, with an interest in the enrichment of that culture;
   * responding to the changes taking place in society and accepting the insecurity which these changes involve.

The school has a key part to play in the education process and its responsibility is increasing, in so far as it can rely less and less upon parents for assistance in achieving the aims of education.

The education schemes which the Communities are asked to adopt are demanding. They must be directed towards making the school an instrument for the following:

a. passing on knowledge and skills which are structured and consistent from the point of view of lifelong education;
b. developing attitudes in conformity with the values held by the community;
c. developing the personality of each pupil having regards to his aptitudes and interests, but also taking account of the requirements of society;
d. making each pupil aware of the responsibility which he bears for developing his life;
e. providing equality of opportunity with regard to education by taking differences between the pupils into account.

Thus the schools seek, with varying degrees of success:

a. to prepare young people for a full personal life, for active integration in a democratic and multi-cultural society and for willing involvement in the welfare of the community by the competent exercise of a trade or profession;
b. to work in close collaboration with families, local authorities, various social and cultural institutions, the world of work, etc.;
c. to offer young people a variety of programmes, enabling them to become active participants in their education and in the life of the institution and to prepare themselves for lifelong education.

The patterns of instruction and the general and specific aims laid down in the programmes endeavour to be perfectly consistent with the aims of education; in this, however, they are not always successful, in whole or in part.

There is a very clear grasp at school level of the necessity to work out together a precise and consistent education scheme which gives effect to the fundamental values of a school community, the objectives which it sets for itself in the sphere of education and the requirements of continuity, responsibility and effort which it is prepared to accept to implement these.

Compulsory schooling

Compulsory schooling was instituted in Belgium by the Law of 19 May 1914, but could not be implemented until after the First World War, in 1919. It started at the age of 6 and ended at the age of 14.

The Law of 29 June 1983 has extended compulsory schooling. It makes no distinction between Belgians and foreigners and provides that a minor shall undergo compulsory schooling for a period of 12 years beginning with the school year which commences in the year in which he reaches the age of 6 and which ends at the end of the school year in the year in which he reaches the age of 18.

Compulsory schooling is full-time up to the age of 15/16, and includes primary education that normally lasts for 6 years but may extend to 7 according to the requirements of the pupil, or even to 8 years in exceptional cases, and at least the first 2 years of full secondary education; in no circumstances does full-time compulsory schooling extend beyond the age of 16.

The period of full-time compulsory schooling is followed by a period of compulsory part-time schooling. This obligation is met by full secondary education, or by a course of education with a reduced timetable or a training course which is recognized as being in conformity with the compulsory schooling requirements.

Young people may also meet the compulsory schooling requirement by being taught at home, in so far as this teaching satisfies conditions to be laid down by the Crown.

The compulsory schooling period was extended by the Law of 29 June 1983.

The new compulsory schooling requirements affect young people aged from 16 to 18. They must be met by full-time education up to 15/16 years of age and part-time between the ages of 16/16 and 18 years.

Compulsory schooling does not merely cover a period in the life of the pupil: it also aims at a minimum full-time education content - primary education, which must be completed in a maximum of 7 years of exceptionally in 8 years, and the first 2 years of secondary education.

A young person is compelled to remain in full-time education up to the age of 16 only if he has not completed these first 2 years of secondary education at the age of 15. Full-time secondary education includes a minimum of 28 course periods per week for 40 weeks.

The Royal Decree of 16 July 1984 organized experimental secondary education with a reduced timetable as an experiment for a 2-year period. This form of education is organized in 40 centres and each study year includes 12-15 weekly course periods covering both general education and preparation for a trade of profession.

secondary school as at present constituted no longer succeeds in motivating are kept in the part-time education system; and the education provision for young people in the 16-18 group is diversified.

Having satisfied the compulsory full-time schooling requirement, a young person may:

a. either continue in full-time secondary education up to the age of 18;
b. or choose the education with reduced timetable given in the centres referred to above (secondary and tertiary vocational education) or improvement courses (evening or weekend classes);
c. or take a sandwich course (periods of training in school alternating with periods in an undertaking);
d. follow a course of training recognized by the Minister for the Community and the Minister for Education as meeting the compulsory schooling requirements (apprenticeship with small firms and traders or industrial apprenticeship).

If a young person chooses a course with a reduced timetable he can combine training and work, so that these two activities supplement and reinforce each other, as for example in the sandwich-course system.

In practice, sandwich courses exist only in the training schemes organized by the Institute of Further Training for Small Firms and Traders.

The Law of 19 July 1983 on Apprenticeship in Employee Occupations makes it possible to develop this type of education, which aims to give the apprentice complementary practical and theoretical knowledge essential to the acquisition of vocational capability, as well as general knowledge in the economic and social field. Supplementary theoretical training and economic and social training are entrusted primarily to teaching establishments.

Since vocational qualifications are certified by full-time educational establishments, the training courses which lead to these are given solely in those establishments. Young people come into contact with the industrial and economic world and experience (briefly) life in an undertaking only when the study programmes include practical training schemes.

Some study programmes in the education system organized by the State in the French- and German-speaking Communities have been amended, increasing their conceptual content and consistency (eg. by history and mother-tongue programmes); standards of assessment have also been amended, with a view to increased rigour and greater effort.

New technologies

Independently of the use of informatics in school management, this new technology is being introduced progressively into secondary education, as it is in higher education and improvement courses.

It has been introduced in secondary education as a subject in its own right, but also and especially as an aid to assist individual and collective teaching and learning. Little by little, informatics is becoming a new instrument of thought and communication which must form part of everyone's basic skills.

It is also being introduced in secondary technical and vocational education as a constituent of vocational training (applied informatics, word processing, management informatics, digital techniques, etc.).

Suitable study programmes have been formulated in State education. Unfortunately, up to now hardware and programmes have not been purchased according to a consistent plan. "Teaching-Informatics" panel have been set up and multi-annual plans prepared to assist the co-ordinated and integrated development in this area.

DEVELOPMENTS IN THE SYSTEM

(a) Changes and new facts, including quantitative growth, in the various types and levels of education

A special section is devoted here to the introduction of informatics into education, in view of the importance of the subject and its general implications for the education system as a whole.

During the period under review, microcomputers have become common in schools and classrooms. The task of the school and its teachers today is to master this educational tool, to make it serve them, and to answer the key question: how can the computer assist the establishment of better-quality teaching and vocational training more suited to requirements?

How is informatics used in teaching today?

1. The computer in the service of involvement and systematic organization of special tuition. This is a way of combating failures in an essentially monolithic system of education faced with heterogeneous groups and of establishing the mastery of concepts essential for subsequent learning.

2. The computer as an instrument of assessment and testing.

3. The computer as a means of access to databanks and as a means of data acquisition and data processing.

4. The computer as an instrument of simulation. Simulating experiments which are difficult to carry out and studying the consequences of variations in the parameters of a model enables pupils to become active participants in their own learning process.

5. The computer as an instrument of creativity and knowledge-building. This is the highest level of computer use: the computer does not programme the student in this, but the student learns by experience by programming his own problems. He can alter the elements and structure of his knowledge at any time, while retaining access to its former elements and to the previous structure.

Those responsible for the organization of education face a threefold task, to say nothing of the introduction of the computer in managing the assets, finances and teaching methods in the establishments:

i. to make the pupils aware of informatics, by incorporating the informatics culture into the culture conveyed by the school;
ii. to promote informatics as an instrument of teaching and learning, or as an intrument of vocational training;
iii. to put the teachers in a position to take on these tasks, and therefore to train them for this purpose, particularly by means of further training.

The introduction of a new subject into the curriculum is something which can be done.

On the other hand, incorporating informatics into everyday teaching practice in such a way that it is really of value to the teaching method chosen by the teacher is enormously difficult in terms of attitudes, technological mastery and the development of software for teaching purposes which is tailored as far as possible.

The further training offered to teachers is aimed essentially at making them capable of the following:

a. using existing teaching software with full knowledge as part of their teaching;
b. altering some of the variables in teaching software according to local circumstances;
c. designing teaching software in collaboration with programming specialists;
d. designing teaching software and putting it into practice themselves.

In order to bring together the various experiments carried out with equipment which is developing very rapidly, to assess the results of these experiments and so to be in a position to define the resources essential to a policy on training, equipment and teaching-software development, the national education authority (French sector) has obtained the assistance of various universities, with which it has entered into a contract covering "study of the practicability, in teaching, technical and sociological terms, of introducing informatics into teaching, and more particularly computer-aided teaching".

A "Teaching-Informatics" panel has been set up in each of the two Ministries with the task of promoting the use of new technology at all levels in education and to prepare for the establishment in the medium term of a "Centre pour l'enseignement de l'informatique" and a "Vlaams Centrum voor Informatica".

It should be stressed that Belgium is taking great care in the development of informatics in schools, being convinced that it is essentially a problem of teaching methods and staff training.

(b) Development of informal education and other educational programmes for young people and adults

Home study courses

In 1959 the State set up correspondence courses, which were formally recognized by the Law of 5 March 1965.

This type of education has been transferred to the French Community since 1982, and French Community home study courses were organized by Decree on 18 December 1984.

These courses are suited to the level of the student and lead to State Board examinations for a diploma of lower or higher secondary education. Success in one of these examinations makes it possible to resume class study, both at secondary and at higher level.

Home study courses also prepare for recruitment and promotion competitions and examinations for staff at various levels in the public service.

The Decree of 18 December 1984 also provides for the organization of education based on the courses and programmes followed in teaching in the French Community for French-speaking pupils of Belgian nationality resident outside the territoty of the French Community.

The French Community has recently begun to send out:

a. a French and mathematics course for detainees;
b. a French and mathematics course for persons confined to hospital;
c. an informatics course for the general public.

Lastly, the Decree of 18 December 1984 makes it possible to set up courses for the further training of teachers working in the full-time education sector and in the teaching of improvement courses.

At present, home study provides over 130 different courses for just over 10 000 pupils. Moreover, there has been a substantial increase in enrolments, which should result in 13 000 new enrolments for the 1985/1986 school year. Many pupils (about 6000) have enrolled on language courses: the printed documents for all the modern-language courses (Dutch, English, German, Italian, Spanish) are accompanied by cassettes.

Those who design the courses and those who mark the papers are specialist tutors in the discipline concerned.
When the teaching of administration is involved, the tutors are officials of the highest level.

The teaching provided by these courses is large-scale individualized teaching; apart from many problems with the answers provided, each lesson includes homework which has to be returned to the department, accompanied if necessary by questions and requests for additional explanations. This work is returned to the pupil with corrections and comments and accompanied if required, particularly in the case of exact sciences such as mathematics, physics and chemistry, by a model answer.

The relationship is different with further-training courses intended for teachers. Provision is made for the course tutors and their pupils to meet.

French-speaking Belgian pupils pay no enrolment fees for these courses.

Preparation for administrative examinations

As specified by the Royal Decrees of 13 April 1965, 16 April 1965 and 9 November 1971, this preparation includes courses for recruitment and promotion competitions and examinations for administrative staff organized either by the State for the various Ministry grades or by other State departments, provinces, communes and public bodies.

The specific features of the tests have to be taken into account in designing and organizing these courses.

The department may undertake the task of preparation intended for staff members of administration who so wish. Consolidation and revision sessions may then be held within these administrations to supplement the training. Sometimes a mock examination is also provided, aided by cassettes and video cassettes (particularly for preparation for certain tests such as conference reports and criticism).

Every year there are about 300 enrolments for courses providing preparation for administrative examinations and competitions.

Further training of teaching staff

The State correspondence-course department is involved in this work.

Retraining and schemes for the further training of teachers must be accompanied by courses, particularly correspondence courses.

Paid Study Leave

The Amending Law of 22 January 1985 replaced the time-credit system by paid study leave.

Under certain conditions, full-time workers in the private sector may qualify for "paid study leave", ie they can take time off work to improve their general or vocational education.

However, the employer can obtain reimbursement of salary and employer's social security contributions in respect of the days and/or hours of leave taken, from the Ministry of Employment and Labour. Employers pay half the fees for vocational training.

Those employed in the public sector, the Communities and Regions, the unemployed, the self-employed, apprentices bound by a contract of apprenticeship approved by the Ministry of Small Firms and Traders, industrial apprentices and teachers cannot qualify for paid study leave.

As from the first year, the length of paid study leave corresponds to the number of hours in the course, but with annual limits as follows:

a. 240 hours for vocational training;
b. 160 hours for general education;
c. 240 hours for vocational training and general education during the same year.

This leave can be used entirely before the end-of-year examinations, entirely in leave periods apportioned by the month of by the week, or partly before the examination and partly as leave periods apportioned over the year.

The leave may also be taken as whole days or at the rate of several hours only.

The employee is required to submit certain documents to his employer in order to qualify for the leave:

a. certificate of valid enrolment;
b. termly certificate of regular attendance;
c. where appropriate, certificate of participation in a second session.

The worker who qualifies for paid study leave is entitled to payment of his normal remuneration at the usual times. However, the gross renumeration is limited to Bfrs 52 000 per month. As a consequence, the employee who is normally paid more than this has to accept some loss of renumeration.

The employee may lose his right to paid study leave if:

a. the training is given up or interrupted;
b. attendance is not regular enough (more than 10% absenteeism);
c. it is used fraudulently, ie when the employee pursues gainful employment during the leave;
d. there are two successive failures.

The employee who qualifies for paid study leave is also given special protection against dismissal, except on economic or technical grounds or for serious misconduct.

The following forms of education confer the right to paid study leave:

* Vocational training:
  a. improvement courses;
  b. courses in the plastic arts with reduced timetable;
  c. short-type and full higher-education courses organized during evenings or weekends;
  d. long-type and full university-level courses organized during evenings or weekends;
  e. first- and second- stage university courses organized during evenings or weekends;
  f. training organized by the bodies representing small firms and traders;
  g. preparation and submission of examinations to the State Board;
  h. sectorial training courses set up by Joint Industrial Councils;
  i. vocational training courses accepted by an approval panel set up by law.

* General education:
  j. courses organized by trade-union organizations;
  k. courses organized by youth and adult organizations and training establishments for workers set up within trade-union organizations;
  l. training based on programmes approved by an approval panel set up by law.

The employee is free to choose the courses which he wishes to follow within the framework of all these educational opportunities expressed referred to by law and comprising a minimum of 40 hours per year: there need not necessarily be any relationship between his work and the training which he pursues.

National employment office

As laid down in its statutory terms of reference, the National Employment Office (ONEM) endeavours to contribute to increasing the professional skills of those seeking work and those already employed, through vocational training.

The ever-increasing pace of technical developments has been followed up by the Office in the centres under its direct management, for both basic and supplementary training.

On the one hand, those seeking work who lack the appropriate skills must have the opportunity to gain the knowledge which they lack in order to re-integrate themselves into the world of work. On the other hand, candidates with specific training requirements are given opportunities for specialization, further training, improved versatility or introduction to new technologies on special short-term courses.

It is obvious that in recent years these developments have called for special efforts by the departments involved in the running of the centres: renewal of the stock of machines and tooling, adaptation to applications of electronics, the preparation of modular programmes, the preparation and organization of training in advanced technologies and the implementation of collaboration between industry and other systems for vocational training and education all required financial and human efforts.

It goes without saying that organization of vocational training on an individual-Community basis leads to diversification in initiatives. However, it should be noted that the priorities of the Office in this field are still the same, ie to give those seeking work and those already employed the skills or versatility essential for integration or security in a job. This also provides the opportunity for assisting businesses in their problems of recruiting or training skilled staff.

ONEM is now in a position to provide over 120 teaching modules in the following sectors: building, building finishing work, metalwork, woodwork, made-up goods, textiles and knitwear, hotels, restaurants and cafés, transport, the diamond trade, service industries, informatics and business management.

In the case of new technologies, training is offered in the following fields:

a. electronics and automation;
b. energy management and new heating technologies;
c. CAD/CAM (computer-aided design and computer-aided manufacturing);
d. introduction of CAD in the ready-to-wear clothing industry;
e. new textile techniques;
f. robotics;
g. microelectronics;
h. office automation.

Organization of courses in other areas of high technology is under consideration (eg for the graphics techniques sector).
It should be noted with regard to training in informatics that in 1984 a multimedia training project, devised on the initiative of ONEM and in collaboration with Belgian television, was successful beyond all expectations. TV and radio broadcasts, the syllabus and practical exercise days contributed to this success. Encouraged by these results, the Office decided to repeat the broadcast course and to prepare a syllabus on programming logic.

In the present economic situation, features of which are a high rate of unemployment and a decreasing job supply, the category of unemployed whose general or technical education is practically non-existent is still severely disadvantaged; basic training in the centres is still virtually beyond their reach.

ONEM has organized observation, guidance and social and vocational initiation centres for them in the French Community; in the Flemish Community, centres called educational centres not directly targeted on employment are trying to facilitate their involvement in the life of society, to increase their chances

of access to training and to improve their opportunities on the job market. Helping them to achieve elementary knowledge of value in working life is the specific aim of these initiatives in both cases.

The Office has other vocational training resources in addition to the centres under its direct management:

1. Centres established in collaboration with undertakings or groups of undertakings give industry an opportunity to organize skill training for their employees within the undertaking itself. The ONEM Management Committee, which is formed on a joint basis, decides on the action to be taken for each individual request on the basis of the training programme introduced by the undertaking. In any case the courses have to be organized collectively and systematically and, in general, outside working hours.

2. Approved centres, organized on the initiative of undertakings or groups of undertakings, can be set up for regular and continuing staff training requirements. After the decision by the Management Committee, the decision to grant approval and thereby make a financial contribution to the salaries and wages of the instructors and those attending courses in the centre rests with the competent Minister.

3. A formula reserved exclusively for unemployed persons receiving benefit is directed towards individual training in undertakings or in technical training institutions for occupations for which ONEM has no centres and which are indisputably useful from the economic point of view. Small and medium-sized undertakings, whose vocational training requirements are more limited, find this the obvious way of training the necessary staff on the job.

4. The National Centre for Training and Pedagogic Studies is responsible for the basic and advanced pedagogic and methodological training of instructors in the ONEM centres and managerial and supervisory staff from undertakings. It is also active in training educational staff for developing countries at the request of various national and international bodies.

5. Lastly, ONEM subsidizes vocational training in undertakings which are being set up or expanded or undergoing conversion of production. This financial assistance may be granted both for training within the undertaking and for training organized abroad. The decision rests with the regional Minister responsible for employment, after the Management Committee has given its approval.

Institute of further training for small firms and traders

Further training for small firms and traders, which has been organized on an individual-Community basis since the institutional reforms of 1980, is the responsibility of the Executive in each of the Communities. A Decree of 19 March

1985 formally recognizes collaboration between the French Community and the German-speaking Community.

The aim of this training is to enable persons to acquire the general and vocational knowledge essential to the pursuit of one of the independent occupations represented on the Governing Council for Small Firms and Traders (for example, craft, commercial and intellectual training).

Further training

This further training includes the following:

1. Basic training.
   This makes it possible to acquire the necessary skills for the pursuit of an independent occupation and is subdivided as follows:

a. apprenticeship under a contract between the apprentice and the head of the undertaking providing the training, which involves:

   a.1 practical training within the undertaking at the rate of 29 hours per week in the first year of apprenticeship and 32 hours per week in the second and third years;
   a.2 supplementary theoretical training in general and vocational knowledge at the rate of 300 hours in the first year and 256 hours in the second and third years. This supplementary training is given by approved Training Centres.

   A Royal Decree of 31 August 1984 recognizes this training as meeting the requirements of part-time compulsory schooling, as defined by the Law of 29 June 1983 on compulsory schooling. It is in fact a sandwich course, and is intended for young people at least 15 years of age. In 1984 this system covered some 10 000 French-speaking apprentices and about 700 German-speaking apprentices, 75% being boys and 25% girls.

b. Training for the heads of undertakings

   This provides preparation for the general, technical, commercial, financial and administrative management of a small or medium-sized undertaking. This training also is given by way of courses in the Centres referred to above. In 1985 there were 4463 French-speaking students and 202 German-speaking students.

2. Follow-up training, ie:

   a. advanced training, the purpose of which is, in particular:
      regular introductory training for the new problems arising in an undertaking;
   b. retraining, which is aimed at training in depth in new and complex techniques or updating the knowledge of a person who has been able to acquaint himself progressively with problems dealt with in advanced training.;
   c. providing the head of an undertaking with the advice which he requests relating to management and technology.

3. Conversion courses, which enable the head of an undertaking to acquire the skills necessary for another independent occupation, if necessary by appropriate training.

4. Supplementary basic or advanced training in teaching techniques, which aims to improve the teaching performance of heads of undertakings who take on an apprentice.

Agriculture and vocational training of those working in agriculture

Vocational training in agriculture, which was the responsibility of the Ministry of Agriculture, was organized on an individual-Community basis pursuant to the Institutional Reform Act of 8 August 1980. It is currently the responsibility of the Community Executives.

In the French Community, the Decree of 10 July 1984 and its Implementing Order of 6 December 1984 specify the procedures for organizing this further training, which is subdivided into six types:

Type A comprises special-tuition courses for those working in agriculture whose basic training was inadequate.

Type B comprises courses or training sessions providing specific training when the persons concerned are "setting up"; this training is aimed at clearly defined types of undertaking and the emphasis is on studying modern organization and farming methods.

Type C comprises courses aimed at providing periodically, for each form of farming, supplementary in-depth training in farm technology and management or providing special knowledge.

Type D comprises study sessions, conferences, conducted tours and symposia to maintain continuing information.

Type E comprises the training of staff engaged in vocational training in agriculture, employing advanced training days.

Type F comprises the training of staff to train and supervise groups of producers and co-operatives.

A or B type training consists of at least 75 hours of class work and a C type course consists of at least 20 hours.
These activities are organized by approved Centres or organizations and by the French Community.
Those attending the courses must be at least 18 years of age and working in agriculture or in a related sector.

Vocational apprenticeship undertaking (VAU)

1. General principles

* The project involves providing a tool which promotes the social and vocational integration of persons in difficulty. This means anyone with no vocational qualifications, no job and often no income.

* In so far as the VAUs are aimed at individuals who fall outside all the systems, there are no criteria for selection at the outset and no new criteria for exclusion along the way.

* The basic teaching theory involves linking training and work.

* The VAU enters into a contract with the person concerned, under the terms of which:
  - it undertakes to provide social assistance (in the broad sense), a basic training and an introduction to life in society;
  - in return, the person concerned undertakes to pursue a course of training through work (on a variety of sites), in the manner of the trade guild system;
  - the effort made by the person towards his integration is supported by a training allowance. This is justified by the fact that the training includes work and that a useful service is rendered;
  - this training is formally recognized by obtaining a fixed-term contract of employment in the VAU.

  This contract of employment is an integral part of the training, and should give the young person work experience in a real environment.

* Thus this arrangement provides a solution to several problems:

  - it offers drop-outs from school a form of training which is more attractive and motivating because they have the impression that they are working rather than being trained;
  - although it does not culminate in a job properly so called, it does provide real work experience (the fixed-term contract is inseparable from the training). Thus those who complete the course are in a position to adjust to work or to be integrated into new training systems, eg in the ONEM, improvement courses or further education;
  - this is not, therefore, a "factory producing candidates for the dole queue"; although the right to unemployment benefit accrues on leaving the VAU, this is because the person has actually worked and contributed to social security and possesses the minimum skills required to enter the labour market.

2. The period of training in the strict sense

2.1 This is preliminary vocational training through practical work on site accompanied by upgrading of knowledge (French, arithmetic) and an introduction to life in society.

The length of this period will vary according to the individual concerned (soms of them are very alienated) but will be specified in the contract: the minimum is 6 months, the maximum one year.

2.2 A person who has no income must be provided with one. In all cases in which the person concerned receives CPAS (Public Social Aid Centre) assistance he will be paid an additional allowance by the VAU as a training allowance.
In other cases he will not receive his training allowance alone; the VAU will also take effective steps to secure recognition of the right to social aid.
The VAU is entitled in all cases to give a trainee supplementary social aid if this is justified by his personal situation.

2.3 The status of the trainee during this period will be that of a person in education. He therefore does not contribute to social security.

2.4 A minimum number of supervisory staff will be guaranteed security of employment by the authorities. These will be persons having the necessary qualifications and experience for technical training (1/3), general education (1/3) and social support (1/3).
The VAU will also be entitled to call in outside help on a one-off or more permanent basis (an ONEM instructor, a teacher, a skilled worker who has taken early retirement, the Part-time Teaching Centre).

3. The fixed-term contract of employment

* No departure from commercial practice will be sought.

* The trainee is paid on the scale laid down by the sectoral collective agreement.

* The VAU is responsible for paying all wages.

* However, this contract is an integral part of the training system.

A certain number of essential learning processes will still be pursued during the contract. The trainee will not yet be as profitable as a really skilled worker; that is the aim at the conclusion of the contract.

This training will be subsidized by the authorities. This will give rise to no difficulty under current legislation.

The following two possibilities may be considered, by way of example:

1. The ONEM might assume responsibility for a proportion of the young person's wages, on the same basis as for ONEM secondary vocational training in an approved undertaking.

2. Anyone with a contract of employment has the right to study leave for training. A young person could be granted 240 hours of training during his time under a fixed-term contract of employment. Thus the wages paid by the VAU for these hours of training would be reimbursed by the authorities (the King Baudouin Foundation).

S 6

BELGIUM - (Dutch speaking)

Application of the Council Resolution of June 2 1983 -
- EUROTECNET

Actions carried out at the level of the Member State Belgium (Dutch-speaking) under the responsibility of the Ministry of Education

A.

1. On 27 February 1985 the Minister of Education announced a five-year plan for the introduction of informatics into education.

1.1. During the 1985-86 school year an experiment was conducted in the updating of the subject known as "technical and technological training", entailing the incorporation of computer science and the new technologies in the first two years of secondary education at 30 educational establishments in all the education systems. During the 1986-87 school year this innovation, known as information technology, was introduced in 56 state comprehensive schools, 120 Catholic schools and five provincial schools. Almost all state comprehensive schools are now equipped with microelectronic equipment for information technology, and the subject can therefore be taught everywhere in the 1988-89 school year. Information technology will be introduced as as subject throughout the free Catholic education system in the 1989-90 school year.

1.2. At the beginning of the 1985-86 school year an experiment with informatics or initiation into informatics (computer literacy) was launched in the second form (3rd and 4th years) or in the 5th year of about 100 secondary schools in all the education systems at the rate of two lessons per week.

Informatics is to be generally introduced from the 1988-89 school year, and 215 state schools have been equipped with a microcomputer classroom to this end. In the free subsidized education system (Catholic education) 95 general secondary schools and 123 technical secondary schools are taking part in the Initiation into Informatics experiment.

To enable them to teach information science, 650 teachers in the state education system have undergone updating training provided by five teacher-trainers, and an average of two teachers at 220 schools in the free subsidized education system have received similar training from 13 teacher-trainers.

1.3. Since the beginning of the 1985-86 school year all teacher-training curricula have included a course in basic informatics (one or two lessons per week in each academic year).

2. On 1 September 1981 an optional course in "Informatics and programming" in the form of initial training in the use of microcumputer configurations was introduced in the last two years of secondary education in each state combined school. This optional course must be geared to applications in mathematics, science, economics and applied science.

3. At the request of the Minister of Education a special working group drew up guidelines for the evaluation of educational software designed for computer-aided learning (CAL).

In co-operation with universities various pilot projects have been established for the development of educational software, eg

a. for teaching students algebra with a view to facilitating the transition from secondary to university education;

b. the development of educational software by experienced secondary-school teachers for acpects of mathematics and science.

Since the beginning of 1986 small groups of state-school non-form teachers have been trained with the help of university experts to specify educational software for their discipline.

4. Initial and updating of training of teachers

So that the necessary updating training can be completed within a relatively short period, it will be provided in the form of distance teaching. The staff members required were made available in January 1988. The planned general updating training will be provided in cooperation with the Correspondence Teaching Department and Belgian Radio and Television. The course will begin in January 1989.

A correspondence course consisting of 21 lessons linked to 21 televisions programmes is being compiled, and coaching centres will be provided. 10 000 teachers are expected to take part.

Of the funds set aside for the in-service training of teachers, Bfrs 86 million was spent during the 1987-88 school year on in-service training relating to the introduction of new technologies.

Thirty-eight government inspectors attended a three-day initiation course at the National Centre for Updating Training in Informatics.

During the 1986-87 and 1987-88 school years four teachers from the Dutch-language secondary technical education system visited a firm for a course of updating training in the technology of programmable logic circuits (PLCs) and speed regulation with PLCs.

All secondary-school physics teachers were then trained in this new technology by the above-mentioned four teachers at a number of workshops.

5. A declaration of principle on "Information Technologies in Flemish Education" was signed on 26 November 1987. The signatories were:

a. the Flemish Economic Association (VEV) and the Flemish Organization for Robotics and Automation (FLORA) on behalf of the firms invited to participate;
b. the Minister for Education (Dutch-speaking) and the Secretary-General of the Ministry of Education;
c. the representatives of the various education systems;
d. the representatives of the various trade unions.

An agreement was reached by the various parties on a policy for the establishment of a plan for a cohesive system of information, the initial and in-service training of teachers, the provision of equipment and the development of software for the Flemish education system.

6. The continuing training of employees was the subject of a Royal Decree granting paid educational leave to workers in full-time employment who attend evening or week-end courses.

   Workers are entitled to their normal wages while absent from work to attend vocational training courses for a number of hours equivalent to the duration of the courses, up to a maximum of 240 hours per year.

7. As regards the development of skills in electronics and informatics, the following in particular should be noted:

   a. The Ministry of Education has set up a CNC-machine demonstration centre for state education in each of the five Flemish provinces. The object is to train students in secondary and higher technical education in one of the special branches of the new information technologies. The students receive basic training in the use and programming of NC and CNC machines.

      As an experiment a mobile demonstration centre was acquired, so that supplementary training in CAD/CAM and robotics might be provided at the various state schools in Flanders. The mobile centre is equipped with CNC machines, computers, CAD/CAM and robots.

   b. The teaching of informatics, including improvement courses (courses with a limited syllabus), has been stepped up appreciably. Higher secondary technical courses in informatics have been introduced, with such special subject areas as informatics in business administration, industrial informatics and informatics programming. New teaching methods used in this field have included the system of incremental units (modular system), which responds more effectively to the wishes and needs of students and industry.

      This system enables a full course to be taken step by step (module by module) at the student's own pace.

      The aim of this training is:
      i. to improve occupational skills in industry;
      ii. to teach new skills;
      iii. retraining;
      iv. basic training.

   c. The Act of 11 July 1984 concerning the education budget (for the Dutch-speaking part of the country) included a provisional apropriation for the 1984 financial year for Industrial Selectivity Projects in the government and subsidized sectors and in higher education. The six Flemish Catholic Industrial Colleges (university-level institutions for the training of industrial engineers in a four-year course) together formed the Institute for Technological Research with a view to using the subsidies allocated to them to establish at each of the participating colleges a technological and teaching centre for the study of problems connected with computer-integrated manufacturing (CIM). Each centre has extensive CAD/CAM facilities (six workstations) and a number of NC/CNC machines.

The CIM centres have three objectives:

1. to train students to become industrial engineers;
2. to train teachers for secondary schools and for industry;
3. to provide the following services for industry:
   i. the training of personnel in CAD/CAM and CIM;
   ii. advice on CIM by assisting preferably small firms with the implementation of practical projects, including the preparation of work for computer-assisted machines.

B. Activities of the national employment service's vocational training department

The new technology centres established by the National Employment Service (RVA are the profuct of the policy being pursued by the Flemish Government in connection with the third industrial revolution in Flanders.

Training in new technologies is becoming one of the most important policy options for RVA's Vocational Training Department. Shortly after the first edition of FTI appeared in May 1983, activities at RVA's training centres gained momentum.

In September 1983 it was put to RVA's Management Committee that a number of specialized training centres should be established for new technologies to give the unemployed in particular, but also employees, the opportunity of acquiring a thorough knowledge of various new information technologies.

In the ensuing five years the RVA services installed numerous technology centres. RVA training centres for new technologies have been established in the following towns and cities:

CAD/CAM : Hasselt, Bruges, Vilvoorde
ROBOTICS and FMS: Vilvoorde
ENERGY MANAGEMENT: Mechelen
MICROELECTRONICS: Oudenaarde
AUTOMATION: Antwerp, Hasselt, Bruges, Ghent, Louvain, Vilvoorde
NUMERICAL CONTROL: Hasselt, Bruges, Ghent, Vilvoorde
TEXTILES: Wevelgem
READY-TO-WEAR CLOTHING: Oudenaarde
INFORMATICS IN THE CONSTRUCTION INDUSTRY: Denderleeuw
PRINTING TECHNOLOGIES: Turnhout, Louvain
OFFICE AUTOMATION: Antwerp, Hasselt, Dendermonde, Louvain, Wevelgem
INFORMATICS: various centres.

The Vilvoorde training centre, known as Flanders' Automation and Robot Centre (FLARC), is the best equipped in the field of automation. Stand-alone robots are available for basic training courses in robotics. Courses for users are structured around flexible cells (eg handling, machine-loading/unloading, arc welding, plasma arc cutting). The training syllabuses were drawn up in close co-operation with industry. FLARC also has training facilities for programmable robots (PLC) and CAD/CAM applications on PCs.

RVA's main task is the training of the unemployed. The courses may also be attended by employees. There are no age limits: unemployed young people with sufficient previous training receive updating training and experienced employees undergo updating training or are retrained when the content of their jobs changes. All the courses run by RVA are open to men and women. In 1987 special schemes were introduced for the training of women. With account taken of labour-market requirements, a number of proposals were drawn up, relating principally to jobs which are technical in content but are already being done by women. Training activities in the printing technologies, electronics, ready-to-wear clothing technologies, mechanical engineering and computer technologies were restrained.

To ensure a high quality of training in all these technologies, numerous co-operation agreements were concluded with schools and firms on both the provision of equipment and support for training. The latter may concern both the organization of courses and the training of instructors.

RVA organized courses at various levels. For the higher levels the courses include classes given by external specialists from universities and industry. For the lower levels demystification, initiation, operation and user courses in new technologies are held. Their previous knowledge determines the level at which candidates begin. This structure enables participants to advance to a higher level step by step. Some technologies have attracted so many applications that other solutions have been sought. To familiarize the general public with the principles of the computer, the television series "The ABC of the computer" was created in co-operation with Belgian Radio and Television. An accompanying handbook was compiled so that viewers might study the material.

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DENMARK

Application of the Council Resolution of June 2 1983
- EUROTECNET

Actions carried out in Denmark concerning NIT and vocational education and training.

For the past 5-10 years there has been a general mobilization in the field of NIT and vocational training. The EUROTECNET programme has no doubt helped to spread information and to visualize some of the problems we are facing.

The Danish organization of EUROTECNET covers a wide area within the field of vocational training. We have incorporated elements from different training levels and the projects involve commercial colleges, technical colleges, a training centre for unskilled workers and a production centre for unemployed.

The Ministry of Education is responsible for the coordination of the whole project. There has been formed a steering group with participation of the Ministry of Labour, representatives from management and labour organizations and representatives from the training institutes.

A technological change has already been initiated in the vocational colleges and training centres both in regard to hard- and software as well as teaching strategies. For example, CAD and the use of other types of computer applications are increasingly taught. Innovation of this sort must be further supported.

The Governments' action plan for NIT.

The developments of NIT is one of the most important social events which has taken place since the Second World War.

It is essential to apply this technology to achieve objectives such as a high standard of living, full employment and a better environment in which to live.

The NIT-market is one of the most important growth markets for trade and industry in the coming decades. Therefore the government is of the opinion that a special effort is necessary. For example a 5-year action plan for new information technologies was launched in 1985. The plan is known as "The Technological Development Programme" and is primarily aimed at businesses, but it is also expected that vocational training institutes will play an active role in this programme.

It will be obvious to most people that vocational training should of course include a clear slant towards information technology, the techniques of electronic data processing and informatics. But if one takes a closer look at the goals embraced by this approach, the situation is not so simple.

This is principally due to two circumstances: in the first place it is not absolutely clear what the objective is of a vocational training course as such, in the second place the vocational training system is characterised by numerous (200-300) often totally different courses from the point of view of goal, structure, content, etc.

Pedagogy

In the education concerned with informatics a great deal of importance is attached to the demystification of electronic data processing technology in order to give the student a better opportunity of determining his own standpoint. It is also essential to give the student the chance of attaining the level of development prevalent in trade and industry.

Over the years we have experienced success in starting the students off by confronting them with ready-made "open" systems which can actually do something - for example operating a small crane - and where the software is built up of small easily comprehensible modules (procedures). On the basis of concrete experiences regarding the use and adaptation of software, the students acquire a broader understanding which enables them to develop and modify themselves.

The aim in the coming years is to develop more models than those we already have because this is a good way of illustrating the application of new technology and because the use of models offers better opportunity for student-activity and hands-on pedagogy. In addition, the models are of course considerably cheaper than 1:1 provision of cranes, lathes, electricity supply stations, etc. thereby enabling us to purchase an even larger number.

It is our belief that demystification and a relatively thorough introduction regarding the potentials and difficulties of the technology of electronic data processing is an inevitable condition if students are to be able to understand and work with technological developments.

Since it appears that there has been a tendency for education to somewhat neglect girls, a research and development programme was recently initiated with the aim of contributing to the development of educational principles which provide for girls and which can ensure that they receive the same career opportunities as boys. We are of the opinion, moreover, that a pedagogical development of this nature will also be to the advantage of boys, as well as trade and industry and the rest of society.

Teacher training

The training of teachers in informatics and subjects related to data technology is a key factor in the process of change taking place in vocational training colleges.

"The National Vocational Pedagogical Teacher Training" has initiated a broad advanced programme in computer studies for teachers at vocational training colleges. The training programme includes courses to provide competence in informatics as well as courses in fields related to data technology e.g. CNC and CAD/CAM.

Electronic Data Processing Equipment

Since 1980 the vocational training colleges have purchased micro-computers for use in computer studies and as an aid in other subjects. Careful attention has been paid to the purchase of compatible equipment with a view to the exchange of programmes.

In addition there is peripheral equipment such as printers, plotters, digitizers and graphic cards.

The purchase of CNC equipment has been started and will be continued, and equipment has also been purchased for CAD/DAM purposes.

Vocational education and training in the future

In May 1986 the Ministries of Labour, Finance, Industry, and Education sent out "A publication on growth and change". It is here pointed out that the process of renewal to a large degree requires flexibility and changes in the educational system. It notes that there is a connection between technological development and qualification demands, though there is no direct correlation between technology and qualifications.

It is also stressed that education must contain an incentive to develop creativity and independent thought in the individual.

It is the opinion of the Ministry that these demands can be summed up in one objective, that education must support a functional broadness of qualifications. This means that care must be taken that students acquire comprehensive and broad and basis qualifications.

In 1987 a committee led by Professor Lars Nordskov Nielsen made public a report on the reform of the Danish vocational training system.

The committee has concluded that future vocational education must support flexibility and innovative qualifications. It is therefore of utmost importance that this education be basic and interdisciplinarily oriented. This must also form the basis of our considerations in relation to the use of computers in education.

Another important bearing is the clear political signal to increase decentralisation of all training initiatives and responsibilities, leading to rapid acknowledgment and definition of new qualifications and skills.

Right now the reform is under way in Parliament and might consequently be effective from 1990.

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FEDERAL REPUBLIC OF GERMANY

Application of the Council Resolution of June 2 1983
- EUROTECNET

I. Education and Employment

Information technology and its applications are among the basic determinants of changes which can already be discerned and are likely to occur in the future in the production and organization structures of enterprises. These changes are in turn having a strong impact on required qualification structures. Initial and continuing vocational training therefore play a key role in ensuring that entreprises remain innovative and competitive and in safeguarding employees' jobs.

Typical of the new flexible production and organization structures is the merging of individual processes into complex systems of interrelated and interdependent sub-processes with the aid of information technology and microelectronics. This makes it possible, and even necessary for operational and technical reasons in many cases, to abandon the division of labour and re-combine tasks in the various parts of an enterprise.

Changes in organization structures entail changes in the structures of activities. In general, there is likely to be a decline in simple routine activities and a rise in increasingly complex tasks, leading to relatively high growth in managerial tasks and in teaching, training, and counselling activities. On the other hand, the number of gainful activities involving purely manual and mechanical production processes, warehousing and dispatching tasks and simple office duties will decline significantly.

The advance of information technology is therefore not only creating a need for information-technology skills in the more restricted sense. Jobs and working conditions as a whole are in fact changing. Besides proficiency in a given occupation and the required knowledge of information technology, general skills extending beyong a given function (known as key skills) and a broadly based general and specialized training are therefore gaining in importance.

If a distinction is made between employees who do their work mainly with information technology (programme-controlled work aids) and those who use information technology only occasionally, there were about 1.5 million main users (7% of all wages and salary-earners; 1979: 6%) and about 3.2 million occasional users (almost 14%; 1979: 9%) in the Federal Republic of Germany in 1985/86.

The past trend and current estimates indicate that the demand for employees with the skills described above can be expected to increase in the long term, with the demand - in absolute terms - likely to be higher in "peripheral" and "mixed" occupations than in "core" occupations.

II. Vocational Training

Since the adoption of the Government's report on "Information technology" (1984) both employers in the Federal Republic of Germany and the Federal Government and Länder have introduced extensive measures which have significantly improved initial and continuing occupation-related training in information technology along the lines indicated in the Council Resolution of 2 June 1983. These developments cover almost all occupational fields. The focal areas of activity are:

a. the modernization of initial training as part of the restructuring of recognized training occupations;

b. the programme of action entitled "New technologies in vocational training", which was presented in 1985;

c. the measures taken by the Federal Institute for Labour under the Employment Promotion Act (AFG) as part of the "skill-upgrading offensive".

1. The modernisation of initial training

The centrepiece of German vocational training is the dual system of initial training in, currently, 380 government-approved occupations. This training is divided between largely practical training in a firm, sometimes assisted by an inter-plant training centre, and theoretical instruction at a (part-time) vocational school.

As new technologies, and information technology in particular, are constantly spreading in industry, the training regulations must be revised to ensure that trainees are equipped to use these technologies.

The modernization of the training regulations is therefore vital to the adjustment of initial training to changes in the requirements of employers in the Federal Republic of Germany along the lines indicated in the Council Resolution of 2 June 1983.

The training regulations specify standard national minimum requirements, which are attuned to the skills needed by firms. The revision of these regulations thus takes account both of trends in firms' requirements and their ability to provide training and of trainees' needs.

The training regulations are drawn up by the Federal Institute for Vocational Training (BIBB) in co-operation with the employers' organizations, the trade unions and the Länder and are issued by the competent Minister in agreement with the Federal Ministry of Education and Science. To ensure that appropriate account is taken of the new technologies in the training regulations, representatives of the trade unions, Länder and Federal Government meet regularly at the BIBB's offices to discuss the implications of the new technologies for initial training. Of the DM 32 million spent on research and development at the BIBB each year, over a third is earmarked for studies of skill structures and the promotion of training in the new technologies. The BIBB also holds seminars on "New technologies".

New training regulations have been issued for about 75% of all trainees. New regulations are currently being drawn up for a further 15%. The new regulations recently issued have chiefly concerned the major industrial training sectors which have been particularly affected by technical advances, like metalworking, electrical engineering, the chemical industry, printing and the retail trade. In many cases, new training structures are having to be created. Thus the 37 industrial metalworking occupations of the past have been merged into six broadly based occupations with a total of 17 profiles.

The former 13 occupations in the electrical-engineering industry have been reduced to four, with eight skill profiles.

The training regulations ensure, among other things, that trainees acquire not just a knowledge of a specific system but above all a basic understanding of new technologies, the aim being to enable skilled workers and salary-earners to adjust quickly and flexibly to technological change and the resulting changes in job requirements. The essential learning objective is independent planning, performance and monitoring of activities. The more recent training regulations in particular have been so worded that they make adequate allowance for technical, economic and social development and so ensure up-to-date training in the long term. They do not specify given technologies or processes but relate the new technologies to functions and tasks.

If the ability of firms to provide training is not to be put at risk, however, specific and consolidating training contents relating to the new technologies, possible future changes in the performance of occupations or the latest technological advances cannot be prescribed until the technologies concerned have matured and been put to the practical test and are in sufficiently widespread use in firms. Some of these aspects will be covered by continuing training, which may also perform the function of a pacemaker for initial training.

The Federal Minister for Education and Science and the Federal Minister for Economic Affairs have long been supporting inter-plant training centres. In recent years additional funds spent on equipping inter-plant training centres with new technologies have led to considerable expansion, particularly in the range of occupation-related initial and continuing training in information technologies.

The Federal Institute for Vocational Training, Berlin, assists with the planning, establishment and further development of inter-plant training centres, which now number over 600 and provide important additional training, mainly in craft occupations, as a complement to that provided by firms. For the guidance and information of the bodies running these centres planning aids designed to ensure the required standard of construction and equipment (eg for CNC technology) have been created in co-operation with experts. Research is also being carried out into the possibility of inter-plant training centres being used for continuing training in the new information technologies.

The outline curricula for instruction in vocational schools are similarly covered by the restructuring of the dual system. They are being compiled by the Länder, which coordinate them with the Federal training regulations, and are published at the same time as these regulations.

The development of training in information technologies at the vocational schools in the Federal Republic of Germany is furthest advanced in the commercial-administrative and industrial-technical occupational fields/occupations. Development in the other occupations, eg in the agricultural and home economics sectors, has reached various stages in the Länder.

Training in information technologies is provided in different organisational forms and with different numbers of lessons at part-time and full-time vocational schools. At part-time schools the integrative approach dominates, ie during the compulsory instruction information technology is taught as part of such subjects as occupation-specific instruction, organization techniques/data processing and book-keeping. At full-time schools information technology is more often taught as a

separate compulsory subject. The total number of lessons at such schools ranges from about 14 to well over 1000 periods on the theory and practice of information technology where a qualification in information technology is the principal objective of training at the school concerned.

As they have done for schools providing a general education, the local authorities, being the bodies responsible for the schools, and the Länder too in some cases, have spent considerable sums equipping vocational schools with computers and microprocessor-controlled devices and machines. In 1986, for example, some 75% of industrial-technical and commercial-administrative vocational schools had computers.

2. Programme of action entitled "New technologies in vocational training"

The programme of action entitled "New technologies in vocational training" comprises Federal Government research projects, pilot projects in industry and pilot projects at vocational schools, and instruments for the implementation of these projects.

Most of the initial and continuing training pilot projects in industry are being implemented in firms. They are assisted and overseen by the Federal Institute for Vocational Training (BIBB) on behalf of the Federal Ministry of Education and Science (BMBW). The Länder are implementing pilot projects at vocational schools under the auspices of the Federal Government/Länder Commission for Educational Planning and the Promotion of Research and with assistance from the Federal Government. The Federal Minister for Education and Science has provided a total of some DM 30 million in development resources for this purpose. The wide range of pilot projects now covers the most serious problems connected with the content, methods and organization of in-plant and in-school initial training and out-of-school continuing training in the following technologies:

a. office technology incorporating integrated data and text processing and integrated information and communication networks;
b. control engineering and automation for measurement, control and adjustment in manufacturing and in the servicing and maintenance of microprocessor-controlled machines and equipment;
c. computer-aided drawing and design.

Many projects include the initial and updating training of trainers for out-of-school initial and continuing training and of vocational school teachers. The national demonstration projects being implemented under the EUROTECNET programme form part of the Federal Government's programme of action and represent a typical cross-section of current activities here.

The quantitative and qualitative expansion of continuing training is an important component of the "New technologies in vocational training" programme of action. The continuing training system in the Federal Republic of Germany is characterized by numerous training bodies and a wide range of courses. Plurality and competition are its essential features.

Continuing training leading to the award of master craftsman certificates and relating to a few other occupations requiring advanced training is governed by Federal regulations. In addition, there are currently some 900 regulations on advanced training issued by pertinent agencies, particularly chambers of industry and commerce, for their regional areas of jurisdiction, including a number of technology-related regulations for programmers, micro-operators, NC/CNC specialists, etc.

The findings of recent surveys show that from 1980 to 1985 23% of German employees took part in continuing training/retraining, 3% more than from 1974 to 1979. Employees in office and administrative occupations with high-level qualifications largely accounted for this increase. An above-average proportion of users of programme-controlled work aids participated in such schemes (48%).

The process of technological innovation is thus one of the main triggers of continuing-training measures. Appreciable increases in rates of participation are to be found principally where this process is highly dynamic. About half of all continuing-training measures were arranged by employers/firms. A survey conducted by the Federal Institute for Vocational Training, Berlin among 150 chemical, electrical-engineering, machine-building, metalworking and textile firms that provide continuing training revealed that as early as 1982/83 over two-thirds of the continuing-training courses run by these firms focused on "new technologies" in terms of participant-hours.

Chambers of industry, commerce, crafts, etc, trade associations and manufacturers, and other bodies (eg trade unions, technical colleges, adult training centres) accounted for the other 50% of continuing training measures. In off-the-job continuing too, there has been a significant increase in measures relating to new technologies. This is true of both commercial-administrative and industrial-technical applications. The Federal Institute for Vocational Training, Berlin, estimates that in 1985 about 800.000 people took part in off-the-job continuing training schemes concerned primarily with information technology.

An important focal area of continuing training in the Federal Republic of Germany is formed by projects which improve girls' and women's opportunities of gaining access to information technology and their prospects of finding jobs and obtaining continuing training in this field. Since 1985 a total of six special projects of this type have received assistance amounting to about DM 3.4 million. When assisting any project, the Federal Ministry of Education and Science also generally ensures that account is taken of girls and women and of their specific problems.

The Federal Government has already developed basic activities in the past, especially the former programme of pilot projects known as "Access for girls to training for industrial-technical occupations" and the projects for the "Continuing training of women in the field of information technology". The aim here is to develop and test ways and means of introducing women to the information and communication technologies. These measures are aimed specifically at unemployed women, women bringing up children (so that they keep in touch with their occupations), women who have finished bringing up their children (to facilitate their re-entry into working life) and working women who need a knowledge of information technology to keep their jobs.

In addition, a nation-wide information campaign aimed at both women and firms has been launched.

3. Measures taken by the Federal Government under the Employment Promotion Act (AFG) as part of the "skill upgrading offensive"

The action taken by the Federal Government under the Employment Promotion Act is designed, among other things, to help ensure that the adverse effects which technological development or changes in economic structures

may have on employees are avoided, redressed or eliminated. The instruments used under the labour-market policy, and especially the further-training and retraining measures, are therefore deployed primarily to cope with the change in skill requirements that accompanies the introduction of information technology.

Under the Employment Promotion Act the Federal Institute for Labour assists continuing-training measures aimed principally at enabling the unemployed and employees in immediate danger of losing their jobs to find permanent employment. Given this objective, courses in the modern technologies are particularly important. For the training of people assisted under the AFG the employment offices take advantage both of private continuing-training measures and of measures initiated by the employment offices themselves and run by the various training bodies for the unemployed on behalf of the offices of the Federal Institute for Labour. To ensure that these measures are oriented towards the modern technologies, the employment offices regularly analyse demand in their regions. Training schemes may also be geared to the specific requirements of individual firms.

In the autumn of 1985 the Federal Government joined with the social partners in appealing for a comprehensive training offensive. As a result of numerous activities organized by the employment offices in co-operation with public and private training bodies, including firms, it was possible to achieve a substantial increase in the number of participants in further-training, retraining and job-familiarization measures assisted by the Federal Institute for Labour. In 1986, for instance, a total of 530 000 people enrolled in training schemes of this kind, 30% more than in 1985. In 1987 around 600 000 people enrolled. It is now planned to consolidate the figure at this level, with growing importance attached to the following aspects of the qualitative improvement of the schemes:

The supply of continuing training must meet demand. Training objectives and content are continuously adjusted to the qualification requirements of industry and of employees or job-seekers, and firms are involved in the planning of training concepts. In the implementation and evaluation of training measures there is increasing consultation between firms, self-governing organizations in industry, employment offices and training bodies.

Data specifically concerning the participants in training measures geared to the new technologies and assisted under the AFG are not available. There is no denying, however, that very many schemes help to adjust vocational knowledge and skills to this trend. In 1986 the occupational groups particularly affected by technological change at the workplace (eg metalworkers, mechanics, tool-makers, electricians, engineers, technicians, accounting clerks and data-processing specialists, clerical staff and clerical assistants) accounted for about 200 000 enrolments in further-training schemes, 26.2% more than in 1985. In the first nine months of 1987 some 155 000 people enrolled in such schemes. It can therefore be assumed that the action taken as part of the skill-upgrading offensive in the Federal Republic of Germany has had a widespread impact.

FRANCE

Application of Council Resolution of June 2 1983
- EUROTECNET

The opening up of frontiers and the constitution of the Single Market in 1992 put our firms very clearly in the face of new challenges both as regards the mastery of the advanced technologies and the more general modernization of our apparatus of production aimed at greater flexibility and a better organization of work.

So in recent years this objective has constituted, to an increasing extent as the 1992 deadline approaches, a priority axis for the development of training policies in France.

We should also note that this concern is increasingly shared by all those involved in vocational training in our country and that it has stimulated both the public authorities and others involved to seek for new ways of intervention and cooperation in these fields.

As a supplement to this, the tense situation of the labour market and, in particular, the development of long term unemployment has led people to devote sustained attention to the effects on certain publics of long term marginalization which could be connected with technological developments.

Taking these two concerns into account, the presentation of the recent measures taken in France and directly concerned with vocational training for the new technologies, can be organized around three points:
- the action on the supply of training
- the action on the demand of firms for training
- the development of social concertation on these subjects.

I. The action on the supply of training

As regards the diffusion and mastery of the new technologies, it is recognized that the quality of our supply of training can be either a decisive advantage or a considerable handicap for French firms. Is our supply of training capable of meeting the needs of those firms who are growing in these fields? Thus, in relation to this objective, it has been decided to reinforce State support programmes and this has been developed in several forms.

First of all, relating to the objective of diffusing technological skills throughout the whole of the industrial fabric, and more particularly among small and medium firms and industries, we have sought to achieve a very great strengthening of our training potential.

The training of engineers.
The programme for training engineers and senior management staff through continuous training constitutes the backbone of this first axis of intervention. The actions carried out in this programme have revealed that an extremely rich potential exists in the French training apparatus.

Thus, the flow of engineers now trained in this continuous training is 1200 per year, or 1/10 of all engineers trained each year in our country. This flow has already increased by more than 15 % this year, and the target has been fixed of doubling this flow five years from now.

Moreover, the ways in which this training is carried out have developed significantly. Illustrating the objectives adopted for the Community COMETT Programme, we find that numerous partnerships have been formed between firms and universities on these questions, and that increasing use is made of multi-media training methods.

More finalized programmes
Seceral supplementary programmes have also been carried out on this axis of technological innovation transfer:

1. Training programmes directly connected to transfers of advanced technology know-how between research laboratories and industrial applications.

   The Fund for Technological Innovation which brings together all higher education and research establishments is the vector of this programme. More than two hundred laboratories are now associated with this programme.

   The actions adopted are essentially seeking two objectives:
   - Developing short training actions of very advanced technology aimed at engineers in firms.
   - Individual reception in laboratories of those employed or seeking employment for developing a new product or process.

2. New actions aimed at increasing the capacity for information and appropriation by firms of scientific and technical innovations: training of scientific correspondents of SMEs, training of industrial project managers.

3. The "Idée-force 92" programme which develops training modules on European questions for insertion in University continued training courses. This new idea will concern all disciplines of university training, but will have a particular stress on technological training so as to give them a broader European coverage.

4. Agreements with large firms and groups of SMEs based on the transfer and implementation of advanced technologies.

   This last idea has been launched in some recent operations. It should become a major line for operations developed with professional branches in the future.

   What we have found is that there is an increasingly pronounced concern for the maintenance and diffusion of technological criteria of performance or quality criteria throughout the whole of the production chain. Thus integrated training operations, embracing the large firms and the network of their SMC subcontractors are indispensable.

The action for disadvantaged publics

In parallel with the specific programmes directed mainly though not exclusively at the highest categories, there are also training actions for the new technologies addressed at more disadvantaged publics.

From this point of view, special mention should be made of two types of actions:

In the programmes aimed at young persons seeking employment but having insufficient qualifications, important pedagogic innovations have been introduced in the search for new qualifications which could be acquired by these young people.

By actions carried out either with training organizations (Jeunes et Technologies network) or with firms (actions for new qualifications) new profiles of the competences sought by firms have been traced, and specific training courses designed so that young persons without qualifications can enter them.

Beyond the experimental phase, these operations open up the way to a restructuring and strengthening of training courses open to young people, and a broader diffusion of access to technological training.
For the long term unemployed, the essential pedagogic innovation consists in the introduction of alternating training, allowing these unemployed people to be reinserted in and become reacccustomed to the universe of work, in particular at the technological level.

These alternating actions, either in the form of training periods or in the form of labour contracts, have permitted those seeking employment and absent for a long time from the realities of work to be reinserted in firms and to readjust their professional competences.

The multi media programme.
The competences of our training apparatus are highly developed in methods which could be characterized as traditional and which remain perfectly valid even in fields of advanced technology.

However, in line with a more general concern, which is met by the COMETT programme, for example, increasing attention is being paid to modern methods of training, in particular those allowing the development of correspondence training and of multi media tools.

So in the last two years, the public authorities have taken the initiative of launching calls for projects, aimed at granting financial support to the design of these products.
Without going into the details of the results obtained from these two calls for projects, two main lessons should be noted:

1. There is no doubt that an awareness, and even a concern, is rapidly growing in vocational training circles in France for the development of multi media tools, and this development has been still more marked in 1988.
   This phenomenon concerns both the designers and manufacturers of products of this type and the users - primarily firms. Imperceptibly, the minimum take-off threshold has been reached, there is no doubt that a market for multi media products is in the process of formation, and this is happening in extremely varied fields of training (rare technologies, management, transverse techniques, etc.).

2. The French potential for creativity and innovation in this fields is remarkable. Confirming the French presence in part D of COMETT, a large number of promoters are presenting quality projects in which the conditions of economic life appear to be increasingly mastered.

The support provided by the public authorities has a decisive role from this point of view, and it generally consists in taking on half the overall costs of designing and making the product.

Taking these potentials into account, this policy can now turn to an active and dynamic diffusion and use of these tools.

Also from this point of view, things seem to be really on the move, and there are more and more operations, in particular those carried out in partnership between the State and the professional branches or the firms, laying the foundations for the development and use of these methods.

II. The action on the demand for training
The central instrument: development agreements.

Since four or fice year ago, a policy of contractual agreements between the State on the one hand and the professional branches and firms on the other hand has been set up and progressively developed, to sustain the development and training of employees. The particular development of this project has been towards a mastery and diffusion of the new technologies.

Three objectives

- To support the development of the training effort decided on by a professional branch and by firms.

- To increase the quality an effectiveness of the training plans carried out, in particular as regards the mastery of technological developments and the articulation industrial investment/training investment.

- To contribute to groups of resources between firms to reduce costs and encourage transfers between firms grouped geographically or on a common axis of production.

Its instruments

Agreements concluded between the State and a professional partner: branch, firms, groups of firms. These agreements cover several years - three years in general. They provide for: the development of the efforts to finance training and the contribution of public funds, the priority objectives and fields for these developments, the follow-up and assessment procedures with which the social partners are associated.

A supplementary instrument for counselling on training for SMEs has been set up. It permits the development of interventions of training engineering for preparing the objectives and arrangements of training plans. Thus, when a firm is faced with important technological modifications, it can obtain financial support from the public authorities so that it can call in an outside engineering office and have a training audit carried out.

Very positives results

Most of the major branches of industry have already concluded an agreement of this type: Metallurgy, Building and Public Works, Textiles, Aeronautics, Plastics, Furnishing. Agreements of the same type are under way with more diffuse branches of industry: Clothing, Paper and Board. Some of these agreements have already been renewed or are in the process of being renewed to ensure that the dynamic process carries on.

Branches that are smaller but of great importance for the economy have also concluded agreements: manufacturers of pumps, foundries, agricultural cooperations.

About a hundred individual agreements have been concluded with large firms. They affects an important number of the major French industrial firms. The financial support from the public authorities remains marginal for them, but their interest is in developing particularly innovative operations of teaching and technique.

A particular effort to help SMEs.

SMEs are increasingly affected by this type of agreement as this policy develops, on a regional level in particular. At the present time, several hundreds of agreements concerning SMEs have been concluded. Three major conclusions may be drawn from these agreements:

- The development of training in SMEs concerning both those located in advanced technological sectors (artificial intelligence, CFAO, industrial prototypes, etc.) and those engaged in more traditional activities (screw-cutting, foundry, mechanics, etc.).
- The development of training plans in SMEs can involve very high levels of financing for them. The agreements which provide for an effort by the firm itself to the extent of 8 or 10 % of the total wage bill are not exceptional, and are even becoming more and more frequent.
- The organization of the training based on groups permits real economies of costs and a pedagogical organization which is distinctly more flexible and effective.

This policy is very broadly supported by professional organizations, and a great part of its success is due to the involvement of these organizations in the implementation of the agreements. This aspect should be highlighted, since there is no doubt that it gives a new dimension to public intervention which is not merely the provision of additional finance, but the triggering off of a dynamic process in which the professional partners are involved.

A supplementary device on forecasting.

More recently, a device for forecasting on vocational training has been set up. What is needed to increase the performance of our apparatus of vocational training, both for the training of firms and of those seeking employment, is greater mastery of the transformation of professions and qualifications, caused in particular by the new technologies.
Several findings have been made on this point:

- On the one hand, our country has rich and numerous sources of information, both in specialist public institutions and in professional organizations. The objective is to exploit them, synthesize them, and make better use of them in the process of decision.
- On the other hand, the different parties involved in national and regional decisions say that they expect to make more use of tools of this kind.

There are three parts to the apparatus which has been set up:
- At the macro-economic level, a general register records trends in the evolution of qualifications and permits us to study the connections and alternative scenarios between economic forecasts and employment forecasts. We thus have a permanent tool for looking back over the past and shedding light on the medium term horizon (five years) in the form of an Employment-Training data bank covering all the sectors and professions of our economy.
- At the regional level, the contracts between the State and the Regions could provide for the installation in each region of an apparatus, tailored to the region, for forecasting and for helping those involved regionally to make decisions. These devices would take great account of the experiments now being carried out.

At the level of the professional branches, new contractual arrangements are being prepared between the State and the professional organizations. Contracts for forecasting studies - a new formula in response to the demand expressed by the social partners - will permit the pooling of public and professional expertise and the joint pursuit of medium term analysis.
A contract of this type has been concluded with the textile branch. Contracts are being prepared with the branches of transport, commerce, metallurgy, clothing and automobile repair.

Taking into account the limits affecting each of these approaches, the apparatus attemps to bring together the three levels of analysis and to contribute elements at each level of decision. Its originality consists in the intention of bringing together, and even pooling, the work done by research insitutes and professionals.

A more general measures: Tax Credit for Training.

A different way in which firms behave as regards training is a structural characteristic of our economy. Although the average effort made by firms is regularly increasing, a large number of our firms, the smallest ones in particular, do not really make use of the advantages conferred by a sustained policy of training.

Thus, of the 110,000 firms legally obliged to finance training, almost 78,000 remain at the lowest level of 1.2 % fixed by the law. This involves a major risk for them of seeing their capacities for competivity deteriorate just at the moment when the frontiers come down in 1992 and of being faced, both on the French and European markets, with firms from neighbouring countries who achieve greater quality and flexibility in their production.

So the objective of the tax credit for training is to encourage these firms to modify their attitude to training and to make greater use of the advantages offered by more permanent policies for the training of employees, gradually catching up with the average level of French firms in this respect.

This measure is also intended for the smallest firms with less than 10 employees and not subject to the legal obligation, and lends support to the voluntary policy they carry out to develop the training effort.

Thus the tax credit for training allows the firm to deduct from its tax on profits a sum equal to a quarter of the annual increase in its expenditure on training.

This measure should permit all firms, in particular the smallest ones, to develop in a more ambitious way the training plans accompanying the introduction of new technologies. Its effects will be fully felt in the medium term, but already the adoption of this measure has created a real wave of interest in modernization and training in firms which so far had remained somewhat aloof from these concerns.

III - Social concertation

It was perfectly natural that the theme of the diffusion of new technologies and of the role which training might play in preparing and helping this diffusion should have been central to the reflections of the social partners in recent years.

These reflections, which have continued almost permanently were, in particular, embodied in a protocol of agreement signed on 3 June 1987 between the professional and union organizations on the conclusion of the Round Table on Vocational Training organized at the request of the Prime Minister.

This protocol stresses that developing the competence of employees is one of the essential conditions for the successful modernization of firms, and that vocational training is one of the best methods to achieve this.

The role of the professional branches is brought out to the extent that they appear particularly well qualified to appreciate the conditions in which vocational training policies should be defined and the needs for training detected which correspond to the competences required.

By this protocol of 3 June 1987, the social partners agreed to invite the professions to enter into negotiations on;

- questions connected with important projects for the introduction of new technologies when these could have significant and rapid consequences for employment, for the organization of work, for training, for working conditions and for the qualification or numeration of personnel;
- the efforts which should be made to train employees with the lowest levels of qualification, in particular to facilitate professional mobility where applicable;
- the taking into account of professional equality between men and women in training actions.
- the search for adequate answers to the specific problems of training in SMEs, including those with no more than 10 employees.
- possible consequences for the organization of training of any changes made in working hours.

The attention of the branches was also drawn to the forecasting and anticipation of training needs, to the development of pluri-annual training policies in firms, and to the development of individual holidays of long duration.

In conclusion

The transformation of our system of training with a view to the mastery and diffusion of new technology have been very significant, and without doubt this is only a start. The awareness of the necessity for revitalizing and boosting our training apparatus is growing at an increasing pace, in relation to this objective.

The present stage - and the EUROTECNET programme has contributed to this - has been a stage of setting up the tools: better forecasts, better coordination, a better pedagogical response.

The stage which is before should be one of a much vaster diffusion of innovations, and a clear growth of investment in training by all involved. For these to be effective, they also need to be better managed and better assessed.

This, without a doubt, is the new challenge which we must pick up.

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GREECE

Application of the Council Resolution of June 2 1983
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Both public and private bodies are involved in organizing and running programmes of vocational training to the new technologies.

1. As regards the requirements of undertakings concerning training in the new information technologies, especially small and medium-sized undertakings, informatics programmes have been implemented in at least 36 undertakings, with subsidies amounting to around DR 145 million.

2. A regards measures to safeguard the jobs or secure the return to the labour market of skilled workers, whether or not unemployed, a school providing accelerated vocational training in the specialist subject of informatics has been set up and will initially train designers and accountants in the new information technologies.

3. As regards the development of qualifications in electronics and data-processing, the centre for technological applications at Kalamaki has introduced specializations such as (a) maintenance and operation of machine tools, (b) quality control of metals, (c) manufacture of tool systems, (d) electronic automation and (e) mechanical/electrical/electronic projects with data processing aspects, which we believe will meet the needs of a broad spectrum of undertakings.

4. As regards the re-training or re-entry into employment of women whose employment is threatened by the introduction of new technologies, data-processing departments are being operated in schools for accelerated vocational training in informatics in the specializations (a) office work and (b) word processing, which to a large extent concern women.

   Moreover, next year (1989) will see the beginning, on an experimental basis, of programmes on "introduction to data-processing - basic knowledge of computer science" in apprenticeship schools, chiefly in the Attiki Basin.

5. As regards vocational education in the new technologies at technical/ vocational lycea (TEL), it should be noted that the sector "informatics" has been operating since the 1984-85 school year with the aim of training computer programmers at secondary level. In the 1984-85 school year, the sector was operating in two TELs, in 1987-88 in 17 and there are plans to extend it for the next school year to a total of 23 TELs. The specialized courses in the sector are taught in workshops equipped with computers which have 16 work stations and operate on the basis of the UNIX system. The specialized courses are taught in classes two and three of the Lyceum for 15 and 21 hours a week respectively and are as follows:

   - design and production of programmes
   - programming Languages PASCAL, BASIC, COBOL
   - systems operation
   - data-processing
   - computer technology
   - basics of systems analysis
   - applications of informatics in firms
   - software packages, etc.

6. Textbooks and notes have been written for the above courses and are made available to the pupils. The teaching staff in the informatics sector at TEL are graduate teachers with post-graduate qualifications of experience in informatics.

In order to ensure that training is successful, seminars are organized on the teaching of informatics and the use of the actual computers employed in schools.

The detailed programme used was drawn up by groups of technical experts in cooperation with university and scientific bodies.

The system of training skilled workers in new information technologies forms part of the more general system of technical/vocational education and is governed by the same legislation.

7. A class in informatics is run in 22 EPL (comprehensive Lyceum) which corresponds to the informatics sector at TEL. The education offered is of the same level and based on the same principles.

8. There are plans to create a department of microelectronics in the electronic sector at TEL and, in addition, a hardware department in the informatics sector.

9. The Public Committee of the Ministry of Education and the Ministry of Transport and Communications, which is responsible for electronics applications and computer hardware, is considering the preparation of a table of vocational qualifications in electronics which will direct training in this field towards recognized vocational qualifications.

10. Following the completion of studies, "informatics" has been introduced in other specializations, such as engineering with programmed machine tools (CNC) and electrics and electronics with the PCCs, etc.

11. The Greek Office for Small Businesses in the manufacturing and crafts sectors (EOMMEX) has prepared two training programmes within the framework of the "informatics" IMP which were aimed at workers and management of small and medium-sized undertakings, one of which concerns basic data and the other informatics in firms.

    In addition, this office takes part in the COMETT Programme with 12 projects concerning training in the new technologies.

12. Finally, similar programmes to the above are implemented by other Ministry bodies such as the Greek Industrial Development Bank (ETBA), Greek Standards Organization (ELOT) and the ELKEPA (Greek Productivity Centre), which runs specialist training programmes in microelectronics, biotechnology, renewable energy sources and documentation and information, corresponding to the needs and specific demands of firms or organizations.

ITALY

Application of the Council Resolution of June 2 1983 - EUROTECNET

In the technical and professional field, the Minister of Public Instruction is carrying out numerous innovations in order to promote individual training and the acquisition of the knowledges and skills which are indispensable for young people leaving school and going into the world of work.

For the purpose of managing the continuous change which characterizes our social life and the labour market of our times, some experimental projects worked out by appropriate study commissions have been prepared, with contributions from expert in the business world. With these projects, the attempt is being made to tackle the problems of the technical and professional field in each sector.

They have the following objectives:

- to break down into uniform groups the great variety of specializations in this field;
- to break down the divisions between theoretical and practical disciplines;
- to use new teaching methods aimed at reinforcing the pupils' own initiative;
- to introduce advanced technologies into teaching.

In the aeronautical sector, a project has been launched, characterized by a modernization of the professional profiles of operators employed in airlines, airport services, assistance to and control of air traffic.
In the technical and industrial sector, the hypothesis has been worked out of a uniform three year plan for the electrical sector, comprising the present specialized branches for electrotechnics, industrial electronics and telecommunication.

In the mechanical sector, a fundamental branch of industrial mechanics has been foreseen, destined primarily for the world of production.

In the textile sector, the project takes the form of a single skill profile for textiles.

In the nautical sector, important innovations have been introduced into teaching programmes, connected with the rapid evolution of technologies, in particular telematics and robotics. The intention is to ensure that pupils have a broadly based vocational training.

In the field of building and surveying, we have taken into consideration the operative sectors in which the modern surveyor will be called on to exercise his profession.

In the commercial field, we have considered both the present and forecast changes in the economic structure of our country and the automation of the management and of the production processes of firms.

In the agricultural and agro-industrial sector, the particular emphasis will be on the aspects of product processing, including the aspect of the autonomous organization of industrial activities using agricultural raw materials.

In the chemicals sector, we have worked out a new profile of intermediate level technician, with economic knowledge in the chemical and biological sector and in the ecology and environment sector. Particular attention will be given to more developed chemistry which requires an advanced vision of the relations between modern production, environment and health.

Finally in the graphics sector it should be possible to guarantee a real possibility of employment for young people. Moreover, in the professional field, we have considered a structure which would provide uniform two-year propaedeutic courses for various qualifications, and at least one-year specialization courses.

We have foreseen professional profiles for: data processing operators, employees in telecommunication, electronics engineers employed on the maintenance of electronic computers, fitters, repairers of radio and television sets, chemical-biological and biotechnological operators.

Subsequent and important initiatives have been made in the field of information technology. From a two-year course, the National Plan was launched for the introduction of information technology into the upper classes of secondary schools, and this involved the project of a massive renewal of the whole of the higher education system, with its point of departure the modification of mathematics and physics programmes.

Another experiment in information technology concerns office automation which involves the educational and didactic management of teaching, non-teaching and student personnel.

All these initiatives are based on numerous updating courses for teachers, among which the most significant are those relating to use of computer-aided design technologies (CAM and CAD).

Pursuant to the Council Resolution of June 2 1983, aimed at developing knowledge of new technologies in consideration of the specific vocational training requirements, the Italian Government has established a large number of useful initiatives based on suggestions from the two sides of industry and the needs of least-favoured regions.

As regards, in particular, the requirements of small and medium-sized enterprises for training in new technologies field have been directed towards small and medium-sized enterprises: they occupy a priority position in the scope of the training policies most directly linked to Italy's economic and social development.

Briefly, action in Italy on training in the field in question is centred on three poles of interest:

The first of these poles concerns training in new management technologies for entrepreneurs and middle managers. Examples are an experimental distance-teaching project launched by the Ministry of Labour (in which the management staff of SMEs are assigned tutors from among staff working in the regional training system) and two projects launched respectively by a private company (CNITE) and a public-holding company training body (ANCIFAP).

The second concerns training in factory automation technologies. It includes projects launched by two high-level training centres (IFOA and CSEA) and the Ministry of Education.

Lastly, the third pole constitutes training in information technologies of the management type, with the participation of the "Centro Polo" in the Veneto Region (managed by a large company operating in the field of software production and training), ENAIP (a particularly high-level "national training body") and the Ministry of Education.

Many of these projects benefit from the constant collaboration of firms operating in the geographical areas concerned, which frequently provide direct consultancy and teaching assistance, hospitality for the trainees, collaboration in regular surveys on the labour market and development of the occupations singled out in the planning of the training actions.

The essential feature of the vocational training courses aimed at the introduction of the new technologies rests in a signifivant component which is innovatory in that it combines twe indispensable cultures: the information-technology culture and the business-economics culture.

In particular, the information-technology culture makes it possible to train a professional capable of developing his actual work as being largely independent of the technological resources used during the course, and hence possessing a remarkable capacity to adapt to the various local company conditions in which the trainees will find themselves at the end of the course.

The business-economics culture represents another important feature of the course, since the professional function of those who work in the informatics sector lies increasingly in the implementation of procedure packages which constitute company management and planning tools and are inserted into a system into which they must fit, and not be grafted on as an independent variable.

The projects reach the reality of circumstances in enterprises through an approach that is readily accessible to those at whom the action is directed. The instructors and the trainees assume active roles that are closely integrated.

In the field of automation, the projects are carried out in close contact with the industrial context concerned, in constant collaboration with hundreds of undertakings and with the assistance of expert consultants, and with the universities.

Obviously, the most significant yardstick lies in the "target" results of this interaction between training and the enterprise: the creation of employment and the joint development of occupational skills and productivity. Many of the projects directed at young people have resulted in more than 90% of participants obtaining employment in the first few months after the course, and all of them within a year. The projects directed at people already in employment have, for the most part, met with a very positive response from the company side. The training in question has enabled some SMEs not only to improve the efficiency of their processes but also to acquire original innovatory know-how that has opened up new strategic prospects in terms both of processes and products.

The implementation of Laws No 863/84 and No 113/85 has also enabled numerous young people to enter working life, by conferring skills appropriate to new technologies or improving inadequate skills, as a result of courses emphasizing the teaching of new techniques of adopting new technologies. Recent figures on the results achieved (with 800 000 young people having entered working life or obtained new employment) support the continuation of the experiment, with a few specific adjustments.

The same applies to the positive effects of the numerous courses of training in new technologies organized by the enterprises themselves and financed by the regions and the EEC which, by improving workers' existing skills of developing their knowledge in the fields of electronics and informatics, have enabled them to remain in employment or to improve the position they already have acquired in the company.

The widespread and detailed publicity in the mass media by the social partners on the likely impact of the adoption of new technologies on the world of work in general has prompted all the regions to adopt special courses to enable women in employment to maintain equal work opportunities.

From what has been said above, it can be concluded that application of the Council Resolution of 2 June 1983 has led in Italy to a generalized rise in the level of skills; it therefore points to the need for an ever-closer link between training and advances in innovation in enterprises and for the creation of a permanent link between training and development, in order to assist in as concrete a manner as possible the processes of internationalization of European undertakings as we move towards 1992.

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IRELAND

Application of the Council Resolution of June 2 1983 - EUROTECNET

A. DEPARTMENT OF EDUCATION

1. General Measures:

Four general measures have been taken within the framework of the Irish education system in accordance with the terms of the Resolution:

(i) Computer Studies has been introduced as an optional module within the Mathematics programme for the Senior Cycle of second-level education i.e. for students from 15 to 18 years of age. Every second-level school in Ireland has been supplied with basic computing equipment.

It is envisaged that students would spend about 35 hours on Computer Studies in the course of one school year. Each student is expected to write and to run successfully about ten programmes.

(ii) Computer Studies is a module within the Electronics Designation of the Vocational Preparation and Training Programme. (This is a course of basic training for young people about to leave the education system of at least 800 hours duration, combining Vocational Studies, General Studies and Work Experience).

The Computer Studies module is organised under the following broad headings: (i) Data; (ii) Problem Analysis; (iii) Artificial Language; (iv) Packages; (v) Computer Aided Learning and (vi) Applications (Control and Monitoring of Equipment, Systems and Processes).

The broad purpose of these courses is to introduce students to the new technologies and to give them basic keyboard skills. They are also designed to broaden students' understanding of the social and economic implications of rapid technological development.

(iii) The Minister for Education established in 1987 the National Council for Curriculum and Assessment. One of the Council's priorities is to develop programmes related to the new technologies at the second level of the education system. To this end a committee has been established by the Council with a view to facilitating the development of new courses of study in the area of technology.

(iv) Over the past two years substantial investment has been made in updating the computer facilities in four of Ireland's ten Regional Technical Colleges. These Colleges are now equipped to meet the most exacting demands of industry for teaching and research services.

2. Specific Initiatives

2.1. EUROTECNET Demonstration Projects:

Five demonstration projects, sponsored by the Department of Education, were launched within the framework of Eurotecnet. Two of these have been completed and an evaluation report is being prepared on them. They have been replaced in the network by two new projects -
Irl 6: Industry Linked Control Technology and
Irl 7: Database/Information Technology.

All the projects are designed to investigate a specific aspect of vocational training related to the new technologies. One project is, in addition, examining the possibility of developing a qualification in control technology.

2.2 Programme Development and In-service Training

Project co-ordinators hold regular meetings with project staff for the purpose of course development and in-service training. These meetings ensure that course development is a shared responsibility and that information is disseminated among the staff of the centres involved in a particular project.
They also help to raise the profile of the demonstration projects in the eyes of the academic community.

2.3 National Dissemination Conferences

Two National Dissemination Conferences have been held in Ireland since 1983. Its scheme was Training Needs in Services and Manufacturing Industries. Its purpose was to bring together representatives of Irish industry and of the education/training system with a view to achieving a closer match between training activities related to the new technologies and the current and future needs of industry for trained personnel. It is thought that the Conference contributed to public information about the applications and consequences of the new technologies as far as employment and working conditions are concerned. It is proposed to invite written submissions from participants in order to draw some more specific conclusions regarding the value of the Conference.

3. The demonstration projects are regarded as a potentially powerful agent of change in relation to training for the new technologies. They have the potential to influence methods and procedures throughout the education/training system and they provide an appropriate mechanism for developing effective links with the world of work.

B. TRAINING RELATED TO INDUSTRY

Introduction

The thrust of recent Irish industrial policy has been towards the identification of high value-added, internationally competitive manufacturing and service industries with the aim of providing standards compatible with those of other successful economies.

The European Commission has stressed the urgent need for vigorous and concerted efforts to ensure that an adequate supply of suitably qualified and trained persons is available to meet the challenges to economic growth posed by technology, at national and community levels.

Economic growth and industrial performance depend to a large extent on the quality of a country's human resources, their skill, enterprise and versatility. This is especially true in Ireland where young people represent such a high proportion of our labour force. People are Ireland's greatest resource. One of the major tasks facing our country is the development of its human resources to create wealth and assure our future economic and social prosperity. Training for, in and through technology is vital to this task.

Training in the use of Technology

Increasingly, economic development is determined by technological advances. By using technology innovatively companies can improve their effectiveness and productivity and thereby gain competitive advantages with new markets, products and reduced costs. A trained workforce exploits new technology; an untrained one becomes its victim.

In Ireland, new manufacturing industries are largely technology-based while traditional indigenous firms are engaged in the transition to more modern methods of production and information processing. A further impact of new technology has been the identification of the services sector as a growth area with internationally traded services offering most potential.

It has been evident for some time, therefore, that a high level of investment in training is a key factor in the achievement of national industrial policy goals of a high skill, high wage economy.

Large corporations in France spend 3.6% of their wages bill on training, similar amounts are spent by US and German companies. The figures for Ireland would be less than 1%.

FAS, the Irish Training and Employment Authority, as an instrument of EEC and National Policy has a central part to play in both the promotion and provision of training in the use of technology. Not alone does it contribute to the improvement of economic performance through training provision, but it also plays a crucial research & development role, anticipating, influencing and responding to changes in manpower policy, industrial requirements and training practice.

As well as maintaining close links with educational institutions and other agencies such as the Industrial Development Authority, Coras Trachtala (Irish Export Board), Irish Management Institute and Industrial Training Committees FAS discharges its role by means of a national network of locally based Training Centres, External Training venues, well developed advisory contacts with industry and an impressive array of training expertise and technology.

Training for technology

Training for technology refers to FAS's work in promoting and providing training for the technologically-based occupations emerging in new and existing industries in Ireland.

These new occupations require not higher order technological skills but also intellectual and social skills of an advanced level. In the technological enterprise, a pyramid of specialised skills is demanded of the new workers and managers; creativity, initiative, problem-solving abilities will combine with inter-personal and team-work competencies to complete the typical skill profile of the modern technologist.

However all workers and trainees will be affected by technology both in having to learn about it and having to learn new skills to implement it.

A further challenge for FAS is the large number of unemployed and socially disavantaged people that make up it's client group. As well as those in employment these groups have to be developed to use technology and given new skills to enable them to acquire employment.

If a sufficient number of personnel trained in relevant specialised skills are not available to particular industrial enterprises, both in the manufacturing and services sectors, the capacity of these firms to expand and prosper is significantly constrained. In addressing this urgent need, FAS has developed and delivered a range of training initiatives in companies, training centres and external training locations spanning two main types of technology:

1. Manufacturing Technology;
2. Information Technology.

1. Manufacturing Technology

The pattern of skills required for industrial success in manufacturing industry is changing rapidly. At all levels, from shop floor to top management, skills which bridge conventional boundaries and enter new knowledge areas are now needed to ensure competitiveness in the market place.

Government policy-makers and independent policy analysts are unanimous in insisting on the importance of developing industry in areas of new technology and developing existing industry with new technology. In these sectors a major constraint is lack of technological skill by both management and workers. FAS plays a leading role in rectifying this deficiency by specific training interventions in the areas of:

* Computer Numerical Control (CNC)
* Robotics
* Instrumentation & Process Control
* Computer Aided Design (CAD)
  - Draughting, Integrated Circuit Design, Graphics
* Materials Requirement Planning (MRP)
* Multi-skilling
* Advanced Manufacturing Technology
* Statistical Process Control (SPC)

As job skills change from motor skills to cognitive there is an accompanying change needed in the type of course offered by FAS. Allied to this the skills turnover and flexibility requirements of modern industry place great demands on FAS. 50% of courses in FAS centres today did not exist 5 years ago. Both existing workers and unemployed have to catered for.

Selected Training Centres responded to the need for technology training by radically altering their existing courses.

For example full-scale working plants have been designed and built to facilitate the enhanced instrumentation skills training presently required. Because it is a skill area undergoing rapid development, the equipment employed is continuously renewed and updated in order to reflect current industrial practice thereby ensuring the relevance of the training provided. CIM cells are being assembled and relevant courses are being integrated. In one centre CAD, Automated Controls, Materials Control, SPC and Data Communications courses are being linked and the trainees move between courses.

Microprocessors modules are being introduced to hydraulic and pneumatic courses.

The latest generation equipment needs less routine maintenance but more highly motivated technicians with initiative, plant knowledge and most importantly, the desire and facility to continually update their skills.

There are requirements for multi skilling in Irish Industry that are unique in the European context. Traditionally there was strong demarcation between the different trades and craftworkers. This was particularly so in the maintenance area between fitters and electricians. Much negotiations were needed before agreement was reached with the Trade Union movement. Krupps in Limerick was the leader in the field. It currently has a major training program in multi skilling that involves the use of Interactive Video on the factory floor and hands-on training in the local FAS centre. Similar schemes are being implemented in Abbott in Sligo and Braun in Carlow.

Not just technicians and engineers but all job categories will need training eg. CNC programming for supervisors, skilled workers and production workers. Knowledge of new materials will be required by all staff. Sales and marketing people will need more product knowledge and will become technical sales staff. Production workers will need problem solving and fault finding skills, they will also be expected to work on their own initiative. Management will have to learn to use computer applications and keep up to date with technological developments. Clerical and professional staff will need to use and implement Management Information Systems and applications software.

The turnover skills will have a major impact on training suppliers, for high tech skills it is as low as 3 years. All trainees will need learning skills as they will be in continous training for all of their working lives. They will also need life skills to help them cope with the flexibility required and the changes in careers that are inevitable.

Industry is now looking for frequent, shorter courses run in company. Training centres run these courses on a sponsored basis for companies either in centre or in company. In fact one instructor runs Programmable Logic Controls (PLCs) courses in company on a permanent basis. Equipment suppliers also use FAS centres to provide training on new machinery.

Courses on Quality and SPC are delivered by the Central Assignment Unit in company. Technology based training and Open Learning will play a larger role in meeting these special demands.

2. Information Technology

The information society is now a reality. One of the greatest issues facing this society is how to exploit the combined power of telecommunication and computing technology so as to propel economic growth now and into the next century.

Ireland has conformed to the general pattern of tremendous increase in office workers and office activity which has characterised nearly all Western economies in the last decade or more. From 1971 to 1981, the total Irish office population (administrative, clerical and technical) grew by 33% while the labour force as a whole grew by only 11%.

The massive growth in the applications of micro-electronic technology to office work has had major implications for training in this area.

The use of information technology in business commenced with the application of computers to increase the volume and speed of clerical tasks i.e. Data Processing; it has developed into providing feedback on operations for management control by way of Management Information Systems and the next stage is the use of Software Applications to improve managerial effectiveness in planning and decision making functions. Underpinning all of these steps, have been the possibilities of integrating and transferring data between different locations and of the sharing of resources, which are afforded by advances in Communications/Networking. These in turn are being linked into the actual production environment to produce an integrated system.

In this sphere, FAS has paved two parallel paths:

1. It has been in applying information technology to its own administrative, training and managerial functions. FAS is one of the most advanced organisations within the state sector in the use of information technology.

2. It has been proactive in the development of training for existing and potential information technology requirements of both service and manufacturing industry. FAS trains people both for hardware and software industries.

Software Training

Programmes are specifically aimed at targeted populations depending on their level of education and experience. For the lower skill levels, FAS provides the following training:

* Computer Operations
* Software Support
* Computerised Office Systems

A wide range of intermediate level training in software systems and applications is offered on the basis of industrial demand in selected geographical locations.

They include:

* Computer Graphics
* Computerised Project Management
* Software Engineering
* Fourth Generation Programming
* RPG Programming
* Systems Software: Unix and C Programming
* Advanced Systems Analysis
* Software Applications

The course modules include Hardware Components, and Software Packages, while Personal Effectiveness training is integrated throughout. Emphasis is placed on practical projects (e.g. generation of a software package and user documentation to suit a particular business system) and the courses are being continuously updated with the addition of new modules such as Data Communications and Integrated Software Packages.
Placement in jobs has been very successful, averaging 85% since inception.

The most advanced information technology software programmes organised by FAS include:

* Courseware Design
* Industrial Software Development

Courseware Design Programme

This programme is designed to provide people with the skills necessary for production of computerised course material to an industrially acceptable standard.

The Courseware Industry, although still at an early stage of growth, has been identified as a significant source of job opportunities in Ireland. Displaying a timely awareness of prospects, FAS piloted two courses in early 1985 which equipped people with skills in authoring systems, learning techniques, video production and editing. They proved successful as regards job placement (85% to date) and were being repeated in 1986/87 with 100% placement. Dublin now has the biggest Financial Courseware production company in the world.

Hardware Training

The Hardware programmes run by FAS include:

* Microprocessor System Design
* Data Communications
* Micro Maintenance
* Computerised Point of Sales Equipment
* Printed Circuit Board Design
* Component Resource Technician
* Electronic Product Development

Training in Technology

This refers to training in the use of and adaptation to technology. FAS has consciously pursued the incorporation of basic training in new technology into all programmes which it promotes, develops and delivers.

This work has involved continuous dialogue with governmental industrial and educational partners in an attempt to ensure that the Irish workforce is equipped to cope with and use the technology which is essential to our national economic development. It has been undertaken in the conviction that FAS's responsibility extends beyond the provision of highly skilled and trained manpower for specific technological occupations to the equally important tasks of

(a) retraining and upgrading the skills of the existing workforce and
(b) enhancing the skills of strategically identified priority groups such as younger and older people who would otherwise find it almost impossible to enter or regain access to an increasingly technological workplace.

While recognising that its primary role is that of specific skills training, FAS considers that general, non-specific training is also necessary for certain client groups e.g. the young person who has not received vocational preparation, the older worker who has not been employed for a considerable time, women returning to work, and the community with limited access to training resources.

An example of this is the Women into Technology course. This course in aimed at older unemployed women and sets out to place them in employment in new technology industries. This area is not a traditional source of employment for women. There are three stands to the course:

1. Electronics
2. Software
3. Personal Development

The course is being run to City & Guilds standards and includes up to 8 weeks in company. The course is 48 weeks long and is a EUROTECNET project.

Generic training in the current age must include inputs on the uses of basic computerised office, industrial equipment and operational skills, this in addition to the usual life and social skills development which is even more important than ever before because of the necessity for flexibility and improved learning skills among the modern workforce.

Generic training of this type increases the employment prospects of these groups and provides the necessary foundation for further skills training.

In practical terms, FAS has implemented this policy of training in technology by several means. In general terms, the following initiatives have been introduced:

Operations/Systems Training is offered on all FAS programmes e.g. keyboard skills, word processing, introduction to the range and type of commerical and industrial applications.

Computer Training Resource Units

Units housing advanced technological training equipement and courseware have been set up in various FAS training locations to enable all trainees to familiarise themselves with new training media and develop new skills by these means. In the past 2 years, FAS has implemented a policy of evening opening to increase access by the community to the technological equipment and expertise located in its Training Centres distributed throughout the country.

As a result of a pilot project on the introduction of microcomputers into small businesses carried out by FAS and co-funded by the European Social Fund, the need for a training guide for potential purchasers was identified. A booklet entitled "Introducing Computers into the Small Business" to assist the selection of computer systems to suit a variety of company needs was produced.

All these types of initiative represent actions to realise the model of the Training Centre as an open delivery system with varied inputs and outputs influenced by market and industrial requirements.

Training through technology

Training, whether transferring physical or mental skills is primarily a communication process and amongst technologies, information technology has the greatest application to the training process, its management and administration.

FAS has been to the forefront, in an Irish context, in developing and employing the most up-to-date training delivery methods, requiring a continuing programme of investment in its own technology base.

FAS's commitment to technology-based training is in response to our dynamically changing environment. The rate of change is constantly increasing and FAS's survival and effectiveness as an organisation will be measured by its response to this challenge. Rapidly changing technology not only affects the type of skills for which FAS trains but also impacts on the manner in which that training is delivered.

Future patterns of work will be radically different: a person entering the labour force will experience three to four changes of occupation during a life time, participate in training throughout life, contend with intermittent periods of unemployment and be expected to develop a variety of work skills.

The type, quantity and frequency of training indicated by this scenario demands a more flexible approach to training. Increasingly there is a move away from the "closed", instructor and subject-based approach towards a more open, learner-centered model.

One method of doing this is by the application of technology to individualised learning programmes.

Individualised Learning

In recent years there has been a move away from long-term residential-style courses for managers and technical staff.

The trend now is for short-term modules of one or two-day duration; much of which is now packaged in self-instruction format. A wide range of self-instruction training packages now exist covering almost every topic imaginable.

This now means that the training can be organised to suit the individuals work schedule and can take place either at work or at home.

The growth in training of this type demands a new and more exciting role for the instructor, whose job will be less and less the dissemination of information, and more and more the management of learning resources and evaluation of the quality and standards of the training.

Training can now begin when the individual is ready and not have to wait until a full class can be organised.

Self-instruction puts the learner very much in control of his or her own destiny and encourages the learner to take more responsibility for their learning.

This has resulted in reduced training costs, reduced training times and better transfer of learning from the classroom to the work environment.

Individualised Learning

In 1981, FAS saw the potential of Computer Based Training (CBT), a new training technology, as an important element in its future development and one which holds many attractions. Where its use is relevant, it can have two main advantages. It can provide a better training service while reducing training costs, after a possibly costly, developmental stage.

The reason that computer technology is destined to be an important factor in human education and training at all levels is due to its interactive potential. It has the capacity to guide and direct learners and respond to their commands. This potential is currently most fully realised in interactive video disc technology, which integrates CBT and video to provide an even more advanced interactive training medium. While CBT uses only computer text and graphics, Interactive Video (IV) brings the added features of video, stills, sound and graphics to deliver training. Expert systems are currently being investigated as a future medium of training.

The training provided through CBT and IV systems is

- individualised
- private
- self-paced
- interactive
- open: trainees determine their own timescale and route through the programmes.

In order to solve existing training needs, many Irish-based companies are turning to technology-based training.

The increased availability and proven effectiveness of Open Learning, Computer Based Training and Interactive Videodisc courseware is providing solutions to a range of training problems. By combining in-house self-instruction with externally available practical skills development, companies are now able to provide multi-skilling training for their workforce with reductions in both training costs and times.

Financial Institutions have traditionally led the field in the application of technology to increase productivity and reduce costs and it is not now surprising to find that they are enthusiastically embracing the use of technology to deliver staff training and development programmes.

Lloyds Bank has installed some 1,4000 interactive videodisc training stations in their network of banks throughout the United Kingdom. The system is used for employee communications and to provide distance learning courses to the banks 46,000 staff.

They also intend to use interactive video technology to market their products and services.

It is not necessary to always think of technology-based training in terms of multi-million pound investments and the training of thousands of staff. On a much more modest scale, if you wish to learn word-processing, or how to use data bases or financial planning packages, it is now possible to hire the interactive videodisc hardware and courseware on a weekly/monthly basis and do the training in your own workplace or indeed at home.

High technology does not always mean high cost.

Training is an investment, and should be subject to the same evaluation criteria as all other investments which an organisation makes.

The extent to which the world's leading companies are prepared to invest in training and training technology indicates the importance with which training is viewed and the need to ensure that staff remain flexible, motivated and capable of performing the tasks that are required of them.

Use of Technology in Training in FAS

During 1981, FAS initiated a pilot project to develop its first courseware package and by 1983, it had established a Flexible Learning Systems Unit to produce CBT and IV courseware in two main areas, Technology and Management Development. In February 1984, FAS entered into an agreement with Digital Equipment Corporation; this one-year agreement under which FAS developed training packages based on DEC's Interactive Video Information Systems (IVIS) gave an impetus to FAS's work in this area.

To date, FAS has developed thirty technology-based training packages.

FAS has invested heavily in the hardware required for courseware production and use. Both micro and mini-computers are used for CBT/IV training. For interactive video, a video disc or tape player is added to the computer. The equipment available is ever-changing e.g. compact disc is a recent innovation and can be connected to CBT systems to add sound to existing graphics or to augment an IV package that has a lot of stills.

These CBT and IV programmes are made available through the FAS Training Centres, this courseware is generally used as part of existing programmes, and is scheduled by the trainers. In some cases, it is possible for industry to "buy time" on the Training Centre computers and thereby avail of the CBT and IV programmes. In addition, FAS rents out the courseware, and the machines required to run it, to industry. Advice and support on obtaining maximum benefit from this resource is also supplied to industry.

All of this activity is evidence of our commitment to the development of CBT/IV programmes for our own internal requirements, for industrial needs and for worldwide distribution.

Changing Role of FAS Trainers

FAS's business is training people and its staff are a vital link in this process. Technology now available can be extremely useful to the modern trainer but the necessary corollary of the trend towards man-machine interfacing is an increased need for person-to-person interaction ("Hi-tech" must be paralleled by "Hi-touch").

There is a need in any training situation to have available at some time during the learning process a person whose expertise is required to ensure success on the part of the learner/trainee. Trainers carry out an essential role in motivating, monitoring, encouraging and evaluating trainee progress.

However, the potential of advanced training delivery media has major implications for the role of the trainer. The capabilities of the new training technology such as CBT/IV and the consequent greater flexibility in location and timing of training delivery are leading to a re-conceptualisation of the training function. Because the trainer is no longer the source of knowledge but the person who facilitates its acquisition by arranging access to resources and managing their use, a managing/consulting/mentoring role is becoming more appropriate for FAS trainers. The "new" training role involves management of the learning process; skills in organising, planning, assessing guiding and motivating are required of the modern trainer.

Trainer familiarity with these delivery systems and acquisition of the new skills needed to manage computer based learning and assessment must be maximised to ensure successful usage and effectiveness of the new learning systems and products being developed and introduced.

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LUXEMBOURG

Application of the Council Resolution of June 2 1983
- EUROTECNET

1. Training requirements and provisions

As in the other countries of the Community, the new information technologies are spreading less rapidly in craft businesses (small undertakings) than in other (medium-sized) undertakings.
Substantial variations can also be seen from sector to sector.

1.1. The requirements are undoubtedly greatest in the service sector. Consequently the use of data-processing tools and management informatics were introduced very early into the initial training concerned, at all levels: CATP (certificate of technical and professional competence), final secondary technical studies (commerce and management) and short courses in our university education (middle management).

The two EUROTECNET projects (L1 and L2) aim at an intermediate level of skill in computerized accounting and file management. At the continuing education level it should be noted that, in addition to training courses organized by the Luxembourg Association of Banks and Bankers and by some large undertakings, the national education system also provides informatics courses in collaboration with the professional institutes, in the context of adult education.

1.2. In the field of industrial production, most undertakings (particularly small businesses) are still using non-computerized production tools. However, the number of undertakings using CAD and numerical-control (NC) machines has increased substantially during the past two years. To meet these new requirements, a project for basic training in automation (including a CAD element, an NC machine-tool element and an element covering information flow in an undertaking) has been worked out for industrial training (draughtsman, CATP and engineering and electronics technician), profiting from experience gained in connection with the EUROTECNET L3 project. The training of electronics specialists (CATP and technician) has incorporated a substantial micro-informatics element for several years. The position is the same in the training of engineers and technicians in the mechanical engineering and applied informatics departments of the Institut Supérieur de Technologie.

1.3. Two projects have been implemented to meet the requirements of hotel training (15) and agricultural training (L4). These projects form part of the EUROTECNET network.

2. Helping unemployed young people to enter working life.

2.1. The rate of unemployment in Luxembourg is very low (1.7 on average for 1987). Young people without qualifications are among the most seriously affected; responsibility for these is assumed, between the ages of 15 and 17, by a reception structure providing "vocational guidance and initiation courses". The aim of this structure is to give these young people a qualification, mainly in trades with a low technical content, to allow their integration into the world of work.

2.2. On the whole, however, action by the national education system is above all preventive; Ministry policy is directed towards giving all young people a prevocational training in information and communication technologies during their last year of compulsory schooling. Subsequent vocational training in a specific sector is superimposed on this basic training. Thus introductory courses covering new technologies have been in operation since 1986 for pupils in secondary and secondary technical

education. With the effect from the 1988'89 school year these courses will be extended to pupils in supplementary education, so that the entire school population will be covered.

3. Helping skilled workers to remain in employment or find new employment.

As a general rule, these workers can take advantage of the training programmes offered by undertakings and adult education (see Section 1.1). Agreements have been negotiated between the two sides of industry in sectors which are in difficulties (the iron and steel industry) regarding the future of workers in the higher age groups.

4. Development of qualifications in the electronics and informatics sectors.

The establishment of informatics companies in Luxembourg has led to a certain demand for maintenance technicians and systems engineers.

The training programme which meets these requirements best is that for engineer-technician (in applied informatics) at the Institut Supérieur the Technologie (baccalauréat plus three years). There is similar training for management informatics as a short course at the Centre Universitaire (baccalauréat plus two years). Training at CATP level and training for electronics technicians has a more industrial slant. Systems engineers are trained abroad.

5. Informing the public.

The Ministry of Education and Youth organizes information days every year for teachers and for the two sides of industry. In addition, conferences are held to mark special events (in particular the EUROTECNET conference). An information day intended specially for the press agencies with a view to facilitating their task of conveying information has been organized with effect from 1988.

THE NETHERLANDS

Application of the Council Resolution of June 2 1983 - EUROTECNET

The report is divided into three parts:
1. developments in standard vocational education;
2. developments in training in the context of manpower schemes;
3. general technology policy.

The Dutch EUROTECNET projects are relevant to these developments in vocational education and training in the context of manpower schemes.

1. Developments in standard vocational education

The Dutch Government has set aside substantial financial resources to encourage developments relating to new technologies. The intended policy in this regard is described in the Informatics Stimulation Plan. This plan has a life of five years: 1984 to 1989. The section on education covers the following aspects:

I. Creation of infrastructure to support the development, description and evaluation of software.

II. Policy on the education sector. The promotion or further development of facets of new technologies in the curricula of the various types of schools in consultation with the educational sector, the support institutions and industry. While the measures under this heading were initially focused on the provision of hardware, the emphasis has now shifted to the development of curricula and software for the engineering, business/clerical and service (health care) sectors. At the same time, Regional Centres equipped with hardware for the teaching of new technologies have been established. At these Centres both relevant groups in standard education and groups of employed and unemployed people learn about or gain experience with new technologies.

III. In-service training of teachers and improvement of their know-how. An extensive range of courses in new technologies is available for vocational teachers.

IV. Initial training for teachers. Hardware is provided for these courses, and the curricula are adjusted.

V. Educational research geared to the introduction of new technologies.

The Informatics Stimulation Plan has led to the establishment of the Foundation for Public Information on Science and Technology. Its aim is to explain current and future developments in the field of new technologies to the general public, with the cultural, socio-economic and social aspects of the above-mentioned developments also taken into account.

Current activities outside the framework of the Informatics Stimulation Plan include:
a. the development within standard vocational education of new subjects relevant to technological change in industry;
b. the accelerated adaptation of equipment used in standard vocational education to technological advances.

2. Developments in training in the context of manpower schemes

At national level the Manpower Division is currently involved in the following training projects geared to new technologies:

1. the National Programme of Crash Courses in Information Science (NIIO). An interdepartmental co-operative project aimed at reducing the shortages of information scientists over a period of fice years through non-standard education;

2. the Action Plan of the Computer Services Industry (CSI).
   The aim of this project is to enable people already working as informatics specialists to unedergo updating training in which they can learn to use the latest advances in automation;
3. the Occupations for School-leavers in Information Technology (ISI) project.
   This project (set up by industry and the Ministries of Education and Science and of Social Affairs and Employment) is designed to train school-leavers and the young unemployed as microcomputer assistants or application programmers;
4. the Foundation for the Informatics Training Project in the Netherlands (PION).
   By undergoing training at a number of firms specializing in automation, unemployed university and higher vocational school graduates are retrained for jobs in informatics;
5. the Vocational Schools for Women.
   Vocational Schools for Women have been established at 19 places. Among the courses they offer are: computer operation, systems management consultancy, CNC metalworking, graphics (including desk-top publishing);
6. the Adult Vocational Training Centres.
   The 24 Adult Technical Training Centres and eight Clerical Training Centres now offer, respectively, CNC metalworking courses and courses in clerical work, including office automation;
7. the Philips Information Technology Training Plan (OIT).
   This plan includes an additional, five-year training effort by Philips to impart a knowledge of informatics to many of its employees.

In addition to these national projects, numerous training projects geared to the introduction of new technologies are being developed by the local employment offices for their own areas.

3. General technology policy

In May 1987 the Advisory Committee on Technology Policy set up by the Government and chaired by Mr Dekker published a report entitled "Interchange between knowledge and the market".

In response to this report the Cabinet adopted the following positions on education and training:

1. the infrastructure of standard education will be used for updating training geared to new technology;
2. the labour-market forecasts must be improved. They must be used as the basis for the development of systems for providing information on training and occupational choices;
3. the provision of hardware and the updating training of vocational teachers must be stepped up;
4. the Manpower Division's training instruments will be geared more closely to technological innovation;
5. demonstration projects will be used to stimulate training activities at regional level;
6. as detailed plans are drawn up for the new Regional Innovation Centres, thought will be given to the supporting role they can play in education and training.

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PORTUGAL

Application of Council Resolution of June 2 1983
- EUROTECNET

1. Introduction

Portugal is at present developing eight vocational training projects in the field of new information technologies (NITs). These constitute the Portuguese contribution to the EUROTECNET network. This network, while aiming at the dissemination of training in new technologies, allows the development of different approaches to be adopted by Member States with a view to adapting their training systems to the new occupational requirements resulting from technological innovation. It is important then to affirm the EUROTECNET network as yet another contribution to the better utilization of human resources, an essential vehicle enabling Portugal to take on the challenges which it faces.

2. General Description of the Portuguese Situation

2.1. Portugal's accession to the EEC (1 January 1986) and the creation of a SINGLE MARKET in 1992 outlined in the SINGLE EUROPEAN ACT, are proving an extraordinary challenge for the Portuguese economy and society.
The modernization and restructuring of the industrial fabric has become a priority task in which new technologies assume special significance.

2.2 The economic growth and modernization of Portugal depend largely on the quality of human resources, on their abilities, flexibilities and enterprising spirit.
There is then an awareness of the urgency for developing concerted action with a view to creating, in both the short and the long term, a qualified workforce capable of coping with the new requirements resulting from the introduction of new technologies in the various areas of activity.

2.3. For new technologies extend to all fields of productive activity, from traditional sectors to advanced industries, a fact that calls for a wider approach to education/training establishing it as the central axis of development. This view, which is being shared more and more by the various participants in the field of education/training (public authorities, social partners), is leading to the investigation of new forms of participation and co-operation, with a view to improving the adaptation of initial and continuing education/training systems to the new occupational requirements resulting from the technological and organizational changes produced by the new technologies.

2.4. Apart from transforming the job and occupational structures of enterprises, automation and computerization also challenge work organization and company organization. Studies carried out in Portugal reveal situations characterized by a high level of skills with the introduction of automation processes, or the existance of a variety of situations of de-skilling, re-skilling or change in skills.
A change in the structure of employment is predictable, with the creation of new, more highly skilled jobs associated with the programming and maintenance of new equipment and a reduction in unskilled jobs associated with repetitive work.

2.5. Opting for technological and organizational innovation places intensified demands on general, vocational and cultural training. The preparation of a concerted plan for the development of training is considered essential in a socio-economic matrix characterized by:
* an industrial fabric composed predominantly of SMEs;
* a very low level of industrialization in most of the country;
* a significant number of poorly qualified workers.

2.6. The problem raised by training and technological change (research/development/innovation) have already been receiving attention in the last few years from the public authorities in Portugal. To mention a few steps:

2.6.1. Technological Development Plan (1983), under the authority of the Ministry of Industry, to be implemented in the space of ten years and having the following objectives:

"To improve technological processes in order to make industry competitive and to develop technical abilities which will give rise to a new era of industrial growth".

The plan was made up of programmes with specific objectives:

a. the reinforcing of scientific and technological activities (infrastructures);

b. the promotion of technological improvement and industrial innovation/new technologies (acquisition, demonstration and training), productivity, information, information projects and workforce development being the most important aspects;

c. sectoral programmes of technological development/creation of an intermediary financial institution - "aimed at activities undertaken by industry" - technological centres. The sectors chosen for these actions were: cork and furniture; ceramics and glass; essential and resinous oils; foundries; metallurgy and metal engineering.

The plan specified the agents to be used in the pursuit of the proposed objectives:

* research institutions linked with public and private bodies (universities, laboratories, etc);

* enterprises and employer associations.

2.6.2. At present the public authorities are continuing their efforts by organizing and expanding the NATIONAL SCIENCE AND TECHNOLOGY SYSTEM, setting for 1990 the target of 1% of the Gross Domestic Product to be spent on research and technological development, complemented by a similar effort in the private sector of the economy. From the list of priorities the following stand out:

* priority to technological innovation in key sectors of the economy;

* scientific research in the field of new technologies and social innovation;

* concerted action in the field of European R&D programmes.

2.6.3. Participation in long-term programmes at the level of information and telecommunication technologies, which are at present in a phase of sweeping changes:

* ESPRIT (information technologies);
* RACE (telecommunications);
* COMETT (training in new technologies/university-enterprise links).

In the field of production technologies and use of new materials - BRITE (research and development programme oriented towards industry).
In the context of international co-operation between enterprises and research institutions in the new technologies field, participation in the EUREKA programme stands out.

Participation in these programmes is based on a network of academic institutions, official bodies and unofficial organizations, which act as dynamic poles of change, through research, training and publication of results.

2.6.4 Still within the shorter term, it is useful to mention the future contribution of plans such as PCEDED and PEDIP.
External Deficit and Unemployment Structural Correction Programme (PCEDED) - 1987, with major areas of action in the following fields:

* public sector financing;
* monetary control;
* trade policy.

In vol. III PCEDED promotes the creation of information technology centres - centres for the support and dissemination of information technologies - and the "Support of activities for vocational training in new technologies".

Similarly, PEDIP - Specific Plan for the Development of Portuguese Industry, has vocational training as one of its fundamental elements. Implementation will begin in October 1988.

2.7. The series of aforementioned actions is complemented by work in the field of initial and continuing education and training. The following should be mentioned:

2.7.1. Actions related to the introduction of new technologies in education. These take the form of projects such as PROJECT MINERVA, which began in 1984-85 and has the following aims:

* the introduction of information technologies into educational practice and curricular plans;
* training of teachers and teacher-training instructors.

2.7.2. Curricular changes affecting the whole structure of formal education in order to meet requirements resulting from the introduction of new technologies and social innovation, and the complete restructuring of education from pre-school to university level.

2.8. Under the authority of the Ministry of Employment and Social Security / Institute of Employment and Vocational Training, priority lines of vocational training are emerging, bearing in mind the guidelines of the

ESF, which placed great importance on training in new technologies (for the employed or unemployed), and concentrating particularly on the training of instructors. They are:

2.8.1. THE APPRENTICESHIP SYSTEM (1984) under the authority of the Ministry of Labour/Institute of Employment and Vocational Training, and in close association with the Ministry of Education (programme guidelines in the fields of teaching, science and technology), as the foundation of a general technology-based training offered to young people with a minimum of six years of schooling.
In this system companies are seen as preferred training grounds and sandwich courses represent a guiding principle.

The apprenticeship system combines technological training with general and on-the-job training. The courses last on average three years.

2.8.2. Project for training instructors in new technologies, being developed by the National Centre for Training Instructors - Institute of Employment and Vocational Training, in collaboration with research bodies.

3. Specific Problems

3.1. The preponderance of the techno-economic point of view (research-development of extensive programmes), which has characterized the Portuguese situation, leads to particular preoccupation with two aspects:

* training of highly specialized technical staff;

* unilateral consideration of entrepreneurs and employer associations in the process of managing technological innovation.

With consequences in the short and medium term.

3.2. The present need for specific programmes with awareness-raising components for organizational aspects, since the introduction of NITs today challenges a vast range of aspects:

* nature, content and organization of work;
* skills structure;
* vocational training;
* working conditions;

3.3. In the above-mentioned there is a group of specific situations within the present Portuguese context which call for immediate action. There are:

3.3.1. The need for enterprises, in particular SMEs, to familiarize and retrain middle managers in the introduction and use of NITs, especially with respect to organizational changes.

3.3.2. Helping young people to enter working life, in particular those with a low level of education, through training measures with the following aims:

* basic technological education in the field of informatics, micro-informatics, telematics;
* specific training for young people in the field of electronics.

3.3.3. The retraining or entry into employment of women, through innovative training measures aimed at facilitating their access to occupations evolving in the field of technology, in which traditionally they have been under-represented.

3.4. Recognition of the fact that only a system of vocational teaching and training in conjunction with flexible and participatory forms of work organization can overcome the specific problems mentioned, according to the EUROTECNET programme an important role, given its basic philosophy.

4. Network of National EUROTECNET Projects

4.1. Based on the three fundamental aims of the EUROTECNET programme:

* to improve the quality and pertinence of measures on training in new technologies;
* to produce new training materials and methods, and new teaching practices;
* to appraise the results in order to facilitate transfer, both geographically and sectorally, in the Community.

In launching the projects at national level the Ministry of Employment and Social Security was concerned with framing them according to three fundamental principles:

i. projects in key sectors of the national economy;
ii. diversification of projects with regard to promoter institutions, geographical areas, target groups, themes and sectors of activity;
iii. participation of various social partners.

One must remember that, because Portugal did not accede to the EEC until 1 January 1986, it did not benefit from the experience of the EUROTECNET programme in its first two years 1985-86.
Diversity as a main feature was considered important owing to the programme's philosophy, which is based on the spread of innovation via different procedures, illustrated by a network of demonstration projects.

4.2. The Portuguese network of EUROTECNET projects is based on a framework of eight projects, characterized by diversity of:

4.2.1. Sectors of activity

* Agriculture - PO1
* Services - PO4
* Textiles - PO3
* Ceramics - PO2
* Civil construction - PC1
* Telecommunications - PO6
* Teaching - PO5, PO7

4.2.2. Social partners/promoters

* Formal vocational training centres
  PO2 - Formal Vocational Training Centre for the Ceramics Industry
  PO3 - Vocational Training Centre for the Clothing and Made-up Goods Industry (CIVEC)

* Research/teaching/training centres
  PO4 - Setúbal Polytechnic (College of Technology)
  PO5 - National Civil Engineering Laboratory (LNETI)
  PO6 - Institute of Employment and Vocational Training (IEFP)
  PO7 - University of Aveiro

* Associations
  PO1 - Portuguese Association for Rural Development (APDR)
  PO1 - Industrial Association of Civil Construction and Public Works (AICCOP)

4.2.3. Target groups

* Young people and adults connected with agriculture - PO1
* Workers in the process of retraining (young people, adults, women) - PO3
* The unemployed (young people, adults, women) - PO4
* Adults and small and medium-sized enterprises - PO1
* Young people and ceramics techniques - PO2

4.2.4. Themes

* CAD/CAM - PO2/PO1
* Telecommunication - PO6
* More than one area (automation, office automation, microprocessors and production planning/control system) - PO4, PO3
* Software (application/development) - PO7, PO1

4.3. The public presentation of the national vocational training projects relating to new information technologies (NITs) took place on 7 March 1988, at which Community technicians were present. A conference to demonstrate the results is planned for December 1988. The role of organiser, funding agency and national co-ordinator of the projects lies with IEFP - Instituto do Emprego e Formaçao Profissional (Institute of Employment and Vocational Training).

4.4. Aims, innovative character and present progress of the project.

4.4.1. PO1 "AGRICONTA"
"Introduction of informatics into farm management and accountancy"

* Dissemination of new information technologies in agriculture, traditionally a sector of low profitability.

* Innovative project as regards target group, training content and training methods.

* Software and equipment of the first phase is completed, the training of instructors is in progress.
  Acquisition of equipment for the second phase until September 1988, and training to begin in October 1988.

4.4.2. PO2 - CERCADEM
"Training of CAD/CAM operators for the ceramics industry"

* CAD/CAM training in the areas of mould design and manufacture for the ceramics industry.

* Innovative project as regards training content, field of training and its links with research and development.

* Instructional manuals and acquisition of equipment completed.

Training of instructors and selection of candidates at the end of this phase in August/September 1988.

4.4.3. PO3 - "SENITEX"
"Promoting awareness of new technologies in the textile industry"

* Promoting awareness of computerized production planning and control systems, microprocessor technology and automation in a key sector of the Portuguese economic context.

* Innovative project as regards target group, training method and being part of a programma of research on new training systems relating to the textile sector.

* First phase of project completed, and second phase in progress.

4.4.4. PO4 - "ADMINISTRATIVE COMPUTERIZATION"

* Basic secretarial training in the techniques of office automation techniques in the administrative sector, a sector with few measures in the area of NITs.

* Innovative project as regards training content and training methods.

* Teaching support material prepared, instructors selected.
Awaiting finance to begin the final phase of the project.

4.4.5. PO5 "Distance Teaching - Computers"
"Introduction of computers into a distance-teaching project".

* Training in the field of informatics with regard to distance teaching, with the following aims:
  - transfer of knowledge in new information technologies, providing contact with microcomputers and programming;
  - the use of distance-teaching methodology, contributing to the dissemination of knowledge in other areas and the decentralization of training.

* Innovative project as regards training methods, training of instructors. Part of a programme of research on methodologies of training in new technologies.

* Manuals prepared, and teaching-software production phase beginning.

4.4.6. PO6 - "RITA"
"Training of planning engineers/installers of subscribers telephone systems under the Subscriber Telephone Installations Regulations".

* Training of electrical installation or telecommunications engineers in the application of the new regulations in a distance-teaching methodology, by dividing the course into modules. Its aims are:
  - the interpretation and application of the new regulations;
  - enabling the installation of telecommunications lines and cables in accordance with the regulations.

* Innovative project as regards the target group, training content and training methodology as part of a research programme.

* The project is in its final phase.

4.4.7. PO7 "IVIC"
"The development of video-computer interaction in training applications"

* The development of software for initial and continuing training in the field of video-computer interaction.

* Innovative project as regards training methods and content, training of instructors and relationship with research and development, as part of a research programme on the role of NIT in training.

* Preparation of the technical and teaching team, as well as interactive informatic-video processing, to terminate at the end of 1988.

4.4.8. PO1 "VIC"
"Use of computers in the civil construction industry"

* Training in enterprises in the construction sector in the field of applications of new technologies, a sector with a large number of workers and a potential market but characterized by low productivity.

* Innovative project as regards target group and training content, forming part of a programme of research on the application of new technologies in the construction sector.

* Preparation of training modules and logistic support completed.

  Phases comprising training for first and second modules completed, and third module in progress. Fifth, sixth and seventh phases of the project, corresponding at the work site, to begin in September/October 1988.

5. Conclusions and Future Prospects

5.1. Analysing the entire network of projects, and their potential impact, it should be pointed out that five of them are part of wider research programmes (PO2/PO3/PO5/PO6/PO7), and furthermore that two of them include the training of instructors in new technologies (introduction of new technologies in teaching practice and content).

5.2. The projects are seen as potential agents of change in training in new technologies. They have the potential to influence methods and procedures in the education/training system, and to develop a suitable mechanism for gaining knowledge of skills in the world of work (new occupations/ adaptation of traditional occupations).

5.3. An insight into the interrelations of local and regional development, under the impact of new technologies and co-operation of the various social partners, in co-operation and development of training.

5.4. In more conclusive terms it is necessary to stress that, although the EUROTECNET network is fundamentally supported by the projects of which it consists, it can not however be reduced to these alone.

Possibly EUROTECNET's main purpose is to generate an increase in training in new technologies, given the central role that these play in asserting Europe's position in the world context.

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SPAIN

Application of the Council Resolution of June 2 1983
- EUROTECNET

In Spain, both the Ministry of Education and Science and the National Institute of Employment (INEM) set out right from the start to attain the greatest degree of diversity for the projects participating in EUROTECNET from various points of view: promoting institutions, geographical zones and target groups, themes and sectors of activity.

It must be remembered that Spain, because it was not incorporated into the EEC before 1 January 1986 was not included in the first two-year EUROTECNET programme of 1985-86. On the other hand, the search for diversity was influenced by two factors. Firstly, from the point of view of the technical equipment, it was pointed out to us that, in general, there was an excessive public sector presence in most of the projects in the different countries, and hence it was expedient to incorporate firms and training centres in the private sector. Secondly, because of the very philosophy of the programme, based on the dissemination of innovation via the different procedures, expressed in a network of Demonstration Projects, it seemed to us pertinent to involve the greatest possible number of institutions and centres, provided that they could launch model projects.

This diversity is reflected in the following manner (the numbers referring to the project reference number in the network):

1. Institutional dependency

Ministry of Education and Science (E14)
National Institute of Employment (E1 and E2)
Provincial Government of Catalunia (E3)
Autonomous Basque Government (E4 and E5)
Local Government of Aragon (E7)
Fund for the Promotion of Employment (E6)
Spanish Confederation of Employers' Associations (E8)
General Union of Workers (E15)
Private firms (E10, E11, E13)
Private training centres (E9, E12)

To sum up, this represents the Central Administration (Ministries of Education and Labour), the Autonomous Administration (Catalunia, Basque country, Aragon), the Social Partners (employers and unions) and various private firms.

2. Geographical zone

2.1 Projects of a national or supraregional character: E1, E6 and E15

2.2 Projects of a regional or provincial character:

- Catalonia: E3
- Basque country: E4, E5
- Aragon: E7, E14
- Country of Valencia: E2, E13
- Andalucia: E8
- Madrid: E9, E10, E12
- Asturias: E11

3. Target groups

- Young people in the educational system: E3, E14
- Unemployed young people (exclusively): E4
- Workers in the process of reconversion: E6, E11
- Young people and small and medium-sized enterprises: E5, E13
- Unemployed (young people and long-term unemployed) and wage-earners: E1, E2, E7, E8, E9, E10, E15

4. Theme and sector of activity

- Design: applied to consumer goods (E3), general (E7), electrical circuits (E10), clothing and fashion (E12)
- Numerical control: E1
- Electronics and Micro-electronics: (E5, E11)
- More than one area of training (data processing, office automation, electronics, etc.): E3, E4, E6, E14, E15
- Simulation: E13
- Telematics: E9
- Databases: E8

With regard to national priorities for formal education, it is very difficult at this precise moment to state them in concrete terms, since the whole of the Spanish educational system, from pre-school to University education, is going through a profound reform.

In any case, the two major priorities are to extend education and improve its quality, adapting it to the many requirements of our times.

These general priorities were expressed in July 1987 in a Proposal of Reform which the Ministry of Education and Science submitted for public debate.

Currently, the debate is in full swing, and only after it is concluded it will be possible to fix the major national priorities, with the agreement of all the social agents involved in education.

In conclusion, the national priorities for vocational training are taking shape in the National plan of Training and Insertion, whose guidelines take into account the orientations of the European Social Fund, this plan being cofinanced by the ESF, which attaches great importance to training in new information technnologies both of the unemployed and of the employed workers and in particular to the training of trainers.

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UNITED KINGDOM

Application of the Council Resolution of June 2 1983 -
- EUROTECNET

New electronic technology has found widespread applications both as the focus of training and in its delivery. During the period of the EUROTECNET programme the British Government, has attached a high priority both to making national skills provision responsive to the needs of rapidly changing technologies and to harnessing those technologies to more effective methods of delivering training.

The Policy Context

Employers have the main responsibility for meeting their own skill needs. The British Government has encouraged firms to provide appropriate training in new technologies by means of the steps listed in paragraph (i). Those steps include the encouragement of the development and marketing of new technology applications to training through, for instance, Open Tech and the Open College.

British Government policies have also sought to equip young people leaving education with the basic skills, including technological skills, needed to compete effectively in the labour market, and to provide a basis for further training by employers. Those steps are listed in paragraph (ii).

Finally, British Government policies have sought to equip adult unemployed people and groups at a disadvantage in the labour market with the skills needed to compete for the new jobs being produced by sustained economic growth. Where appropriate those training opportunities respond to technological developments. The importance of these policies is underlined by demographic trends which will reduce the working population aged between 16-19 years by from 3.4 to 2.6 million by 1994. Activities are described in paragraph (iii).

(i) Encouragement of an appropriate training response by employers:

- The National Priority Skills Scheme, administered through industry groupings helps small firms to develop strategic training in new technologies.

- Local Consultancy Grants and Local Training Grants for small and medium sized companies, helps companies to assess needs and train key workers.

- Managing Company Expansion Scheme identifies and help meet training needs of managers and other key workers to avoid problems or bottlenecks including those caused by new technology.

- The Open Tech Programme between 1982 - 1987, promoted the initial development of learning material developed for use in companies to demonstrate the value of advanced learning technologies. The market for such materials is now expanding rapidly. The Open Learning Programme will build on this by helping to establish appropriate open learning applications in MSC's programmes, among private training providers and in firms.

- The Open College launched in 1987 aims to improve access to skills training using media broadcasts to market open learning to individuals and firms. Courses on offer covers a wide range of subjects, including technology applications.

- The National Training Awards, have encouraged companies to demonstrate the improvements they have made in training their employees, especially where innovation is concerned, and have drawn attention to the benefits of training.

- A network of qualifications is being developed through the National Council of Vocational Qualifications. At the forefront are the new technologies and the new definitions and standards to be applied to them, so that, for instance, YTS traineed can gain suitable certification in advanced electronics.

(ii) Assisting an effective transition from full-time education to work:

- School Computer Campaign. Every school that wanted a computer has had one since 1986. Primary schools now on average have 2, and secondary schools on average have 15. The range of teaching applications of hardware is being developed.

- The Technical and Vocational Education Initiative aims to increase vocational relevance in the school curriculum. The use of new information technology is at the core of the programme - every participant will have encountered at least a micro-computer, and learnt how it can help their work.

- The Youth Training Scheme guarantees training for all 16 and 17 year old school leavers. YTS has always had an Information Technology element as one of the core skills, so that all young people on YTS have the opportunity to gain experience.

- Information Technology Centres (ITeCs). This network of 300 centres has put it at the centre of skills training for thousands of young people. ITeCs' activities are now expanding to help adults seeking IT skills.

(iii) Providing training opportunities for disadvantaged groups including the long-term unemployed:

- The White Papers 'Training for Employment' (February 1988) described the British Government's plans for major public investment to equip longer-term unemployed adults with the skills needed to compete for jobs. From September 1988 existing employment and training measures for the unemployed will give way to the Employment Training Programme offering up to 600,000 places per year of individually tailored training through placements with employers or project work, as appropriate. It will offer training for the skills in demand in local labour markets, including those involving new technology applications.

- The UK Government has long been conscious of the need for training opportunities to be available irrespective of gender. Equal opportunities is one of the MSC's strategic objectives and the principles are applied through direct training provision (including courses for women returning to the labour market) and through external influence. Positive action, where women are under-represented in certain occupations is permitted under the 1979 Sex Discrimination Act. Special provision for women, including training in the new

technologies, has therefore taken place under the auspicies of MSC and the Industry-Training Boards.

- Flexible training methods such as open learning, removing time and location barriers, and allowing use of computers and word processors in the home have significantly benefitted women returners to work and the disabled.

British Participation in EUROTECNET

The twelve UK-based projects in EUROTECNET exemplify the broad range of interests which are involved in vocational education and training in the United Kingdom. Project selection aimed at capturing this breadth; project sponsors include Government, local authorities, polytechnics, Open University, a multi-funded consultancy, and industry. A further aim was that projects should be stable, well established and both able and willing to find the resources needed to participate fully in EUROTECNET. This was successful: only one project has dropped out of the EUROTECNET UK group - which calls itself UK Tecnet - since its inception.

The UK projects have taken advantage of the European links offered by EUROTECNET through taking part in the visits programme enabled by EC funding. Some long-standing relations have been formed, and UK projects have participated in conferences and events in Europe both in the EUROTECNET series and under other programmes, Telecommunication links as well as personal visits have facilitated this interchange. One project (Camden ITEC) has demonstrated the feasibility of joint ventures between training providers in different Member States.

UK projects have also established a communication system among themselves, which includes regular meetings in order to see and understand their colleagues' background and activities. This communication was strengthened by combined action at the "People and Technology" conference in 1986, when UK TECNET had an exhibition stand to promote all the projects. They have drawn strength and mutual help from these links.

The projects which are at various stages of development cover a broad spectrum of learning needs, reflecting the 1983 Resolution:

- home based training;
- various aspects of engineering training (including authoring, CAE, multi-skilling);
- technology training for women;
- computers and electronic training;
- micro-systems for small firms;
- interactive video training for construction.

Some projects have long-term arrangements for funding already agreed, some have less secure futures. Membership of EUROTECNET has been of some assistance to them in negotiating their future prospects, and has enabled them to sport future markets for their particular expertise.

Conclusion

The UK Government regards the experience of EUROTECNET since 1983 as having made a useful contribution to the development of applications of emerging technologies to the content and delivery of training. The impact of the 12 UK projects has been supplemented by the opportunity to exchange information with other Member States through the EUROTECNET programme. The single European market, demographic changes and technological/occupational developments present challenges as well as opportunities to which only an adequately skilled and motivated workforce can respond successfully. To achieve the necessary national training provision to meet those skill needs requires the commitment of individuals and their representatives, and employers, as well as Government. British Government policy and its increased investment in training through the Manpower Services Commission aims to secure that response in accordance with the framework provided by the Council Resolution of 2 June 1983 which established the EUROTECNET venture.

Annex IV

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F - 75007 PARIS

GREECE (GR)

Kostas KYRIAKIDIS (1986)
Thrakis 8
GR - ATHENS - Trachoines

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Ministry of Labour
Pireos Street 40
GR - 10182 ATHENS

(continued GREECE)

Effi BAKALI (1988 - ..)
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Ministry of Education
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IRELAND (IRL)

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Department of Education
Appolo House - 6th floor
Tara Street
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ITALY (I)

Antonio FREDELLA (1985 - ..)
Ministero del Lavoro
Via Salandra, 18
I - 00136 ROME

Maria Grazia NARDIELLO (1987 - ..)
Minsitro Pubblica Instruzione
Istruzione Tecnica - Div II
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I - ROME

LUXEMBOURG (L)

Paul LENERT (1985 - 1986)
Ministère de l'Education Nationale
Boulevard Royal, 6
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6 Boulevard Royal
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THE NETHERLANDS (NL)

Daan KRINS (1985 - 1988)
Ministry of Education and Sciences
P.O. Box 25000
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Ministerie van Sociale Zaken en Werkgelegenheid
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Ministry of Education and Sciences
P.O. Box 25000
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PORTUGAL (P)

Manuel VILHENA VELUDO (1987)
Instituto do Emprego e Formaçao Profissional
Av. Jose Malhoa 11
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Instituto do Emprego e Formaçao Profissional
52 rue Xabregas 2°
P - 1900 LISBON

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UNITED KINGDOM (UK)

Mathilda HARTWELL (1987)
Dept. of Employment
Caxton House
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Manpower Services Commission
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(continued UNITED KINGDOM)

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Colin KING (1988 - ..)
The Training Commission
Open Learning Branch
OL1 W612 - Moorfoot
UK - SHEFFIELD S1 4PQ

BELGIUM

(B1) F
Initiation and/or training in new technologies of specialized workers, youngsters, male or female from companies of all sizes.
Contact person:
M. Paul v.d. CRUYCE
I.F.O.M. - I.F.P.M.
rue des Drapiers, 21
B - 1050 BRUXELLES

(B2) F
Familiarisation with new technologies.
Contact person:
M. Jacques DURIAU
OBELTEN Asbl
Caserne Trésignies
Av. Général Michel 1b
B - 6000 CHARLEROI

(B3) D
Modular teaching system with credit unit; information theory programme.
Contact person:
Mr A. THEUWIS
Provinciale Technische School
Europaplein, 36
B - 3640 MAASMECHELEN

(B4) D
Computer integrated manufacturing.
Contact person:
Mr Charles VERWILT
Katholieke Industriële Hogeschool
J. de Nayerlaan 5
B - 2580 ST. KATELIJNE-WAVER

(B5) D
Information technologies and CNC machines.
Contact person:
Mr J. VANRYSSELBERGHE
p/a H.R.I.T.O.
Welvaartstraat 70
B - 9300 AALST

(B6) F
Training scheme for the open university of Charleroi.
Contact person:
Mme. Christiane VERNIERS
F.U.N.O.C.
Av. Général Michel, 1b
B - 6000 CHARLEROI

(B7) F
Transfer of technology from education combined R & D initiative of value to the creation of enterprises and of work experience and vocational retraining.
Contact person:
M. Corentin ROULIN
CEFORAE Asbl
c/p 194/9
Av. F. Roosevelt, 50
B - 1050 BRUXELLES

(B8) D
"F.L.A.R.C." (Flanders Automation and Robotic Centre).
Contact person:
Mr L. MUYSHONDT
FLARC
Cyriel Buyssestraat 15
B - 1800 VILVOORDE

(B9) D
New technology centres.
Contact person:
Mr BAECK
R.V.A.
Directie Beroepsopleiding
Keizerslaan 7
B - 1000 BRUSSELS

(B10) F
"PRODIDAC" Vocational training with and in new technologies.
Contact person:
M. D. LECLERCQ
Centre de Technologie de l'Education
Université de Liège
Sart Tilman B 32
B - 4000 LIEGE

(B11) F
Experiences in alternating training
Contact person:
M. R. ROBBE
Chambre de Commerce et d'Industrie
Rue de la Station, 134
B - 7700 MOUSCRON

(B12) F
Training of engineers seeking employment.
Contact person:
M. G. FRYNS
C.R.I.F. - Section Plastiques
Rue du Chéra, 200
B - 4000 LIEGE

(Bc1) F
Calculation of the building measurement.
Contact person:
M. J. FASSIN
Centre Scientifique et Technique de la Construction
Rue du Lombard 41
B - 1000 BRUXELLES

(Bc2) F
Computer assisted training in vocational education for the building trade.
Contact person:
M. M. PETILLION
Fonds de Formation Professionnelle de la Construction
Rue Royale 45
B - 1000 BRUXELLES

F = French speaking
D = Dutch speaking

FEDERAL REPUBLIC OF GERMANY

(D2)
Measures for professional qualifications in the field of robotics in continuing education.
Contact person:
Mr Rainer DUHNSEN
Fraunhofer-Gesellschaft Institut für Arbeitswirtschaft und Organisation
Postfach 80 04 69
Nobelstrasse 12
BRD - 7000 STUTTGART 80

(D3)
Electronics in further education for handicrafts in the automobile sector.
Contact person:
Mr Ingo MEYER
Zentralverband des Kraftfahrzeuggew.
Franz-Lohe-Str. 21
BRD - 5300 BONN 1

(D4)
Data processing with MFA-computers in the professional field of electrotechnology at vocational schools and colleges.
Contact person:
Mr Bernhard ENSTE
Eichholzstrasse 9
Postfach
BRD - 5760 ARNSBERG 2

(D5)
Integration of New Information Technologies for commercial training in industry.
Contact person:
Mr Manfred GRUHN
Volkswagen AG
Bildungswesen Wolfsburg
Postfach
BRD - 3180 WOLFSBURG 1

(D6)
Development and testing of valid forms of organisation for local cooperation in further educational training for the promotion of the training, for the promotion of the introduction and utilisation of new technologies in SME.
Contact person:
Mr Lothar-Martin SCHERER
Handwerkskammer der Pfalz
Am Altenhof 15
Postfach 26 20
BRD - 6750 KAISERSLAUTERN

(D7)
New technologies in commercial further training and retraining
Contact person:
Mr Herbert SONDERKAMP
Berufsförderungszentrum Essen e.V.
Postfach 12 00 11
BRD - 4300 ESSEN 12

(Dc1)
Modern information technologies in building techniques training.
Contact person:
Mr Dietmar RETTKOWSKI
c/o Schulzentrum Alwin-Lonke-Strasse
Alwin-Lonke-Strasse 71
BRD - 2820 BREMEN-GRAMBKE 77

DENMARK

(DK1)
Training for computer expert; education in vocational computer science in administration.
Contact person:
Mr Jens Helveg LARSEN
Tietgenskolen
Nonnebakken 9
DK - 5000 ODENSE

(DK2)
From model to reality: development of new simulation models for technical schools.
Contact person:
Mr Helge JENSEN
Paedagogisk Center for Informationsteknologi
Viborg Tekniske Skole
H. C. Andersensvej 7-9
DK - 8800 VIBORG

(DK3)
Computer mechanics course; vocational training programme focusing on both school training and on-the-job training.
Contact person:
Mr Svend Aage OLSEN
Sønderborg Teknisk Skole
Handvaerkerskolen
Grundvigs Allé 88
DK - 6400 SØNDERBORG

(DK4)
Fully automatic process control in a brewery industry; courses for foremen and executive production personnel - both in plant training and school training.
Contact person:
Mr Jens Hilton CHRISTIANSEN
Metalindustriens Fagskole
Telegrafvej 9
DK - 2750 BALLERUP

(DK5)
Training project in CNC for unskilled workers by means of simulation and model experiements.
Contact person:
Mr Finn TIEMROTH
Specialarbejderskolen "Sønderjylland"
Kallemosen 20
DK - 6200 AABENRAA

(DK6)
"P.O.I.N.T." (Production, Organisation, Information, New Development & Technology). Staff training programme for SMEs with regard to the introduction and implementation of NIT.
Contact person:
Mr Bjarne BJERREGAARD
Frederikshavn Tekniske Skole
Hanbaekvej 50
DK - 9900 FREDERIKSHAVN

(DK7)
Information technology centre for young unemployed. Practical training programme leading to employment.
Contact person:
Mr Preben JACOBSEN
Horsens EDB Service og Produkt. Ctr.
Amaliegade 10
DK - 8700 HORSENS

(DK8)
Micro-instructor (a diploma in computer education especially designed to assist small companies which are about to use EDP for the first time).
Contact person:
Mr S.A. ALBRECHTSEN
Haderslev Handelsskole
Kroghs Kobbel 2
DK - 6100 HADERSLEV

(DK9)
NIT workshop as development course; training in the use of NIT as a special offer to unemployed in Storstrøms Amtskommune.
Contact persons:
Mrs Jette RUNCHEL,
Mr Kristian PRIMDAL
Storstrøms Amtskommune
Parkvej 37
DK - 4800 NYKØBING F

(DKc1)
C.A.D. for personal computer
Contact person:
Bo MØLLER
The Jutland Technological Institute - Teknologiparken
DK - 8000 AARHUS

SPAIN

(E1)
Tuition for programmers of machine tools numerically controlled by computer.
Contact person:
Jose Luis PASAMONTES VARA
INEM
c/Condesa de Venadito 9
E - 28027 MADRID

(E2)
Experimental area of industrial design for training designers of consumer and capital goods produced by light industry.
Contact person:
M. V. RAMIREZ CARRETERO
INEM
Urbanizacion "El Palmeral" P-11
E - 03007 ALICANTE

(E3)
Systems of flexible manufacture.
Contact person:
Mme Maria Rosa FORTUNY
Cap. de Serveis de
Programas Escola-Traball
Diagonal 682
E - 08034 BARCELONA

(E4)
Centre for training in new technologies (TCLA).
Contact person:
M. Eduardo ARECHALDE
TEKEL S.A.
c/Maximo Aguirre, 18 bis-2°
E - 48011 BILBAO

(E5)
I.M.I. programme - Incorporation of microelectronics in industry.
Contact person:
M. F. JAVIER DEL HIERRO
C/Gran Via, 2-4°
E - 48001 BILBAO

(E6)
AVERROES: Complete training programme in new technologies for skilled workers.
Contact person:
Pablo PARDO YANEZ
Fondo de Promocion de Empleo
c/Glorieta de Cuatro Caminos, 6-7, 3°
E - 28020 MADRID

(E7)
Training for personnel in computer assisted design (CAD).
Contact person:
M. Ramon TEJEDOR SANZ
Instituto Tecnologico de Aragon
Poligono Actur
c/ Poeta Luciano Gracia s/n
E - 50015 ZARAGOZA

(E8)
Application of the new information technologies in the service of organisations and firms producing selected seeds, agricultural producers, and agro-alimentary firms.
Contact person:
M. José PELLICER
EUROSEMILLAS S.A.
c/Ronda de los Tejares 36-3°
E - 14008 CORDOBA

(E9)
Application and development of telematics in the whole management of computerised firms.
Contact person:
M. Leandro JIMENEZ GARCES
Gabinete Internacional de
Renovacion Educativa
Camino de los Vinateros 4-12A
E - 28030 MADRID

(E10)
Designer of digital electronic circuits with microprocessors.
Contact person:
M. Juan SANDOICA PAJARARES
FYCSA
Condesa de Venadito 5a
E - 28007 MADRID

(E11)
Recycling and training in electronics for new processes of design and manufacture.
Contact person:
M. Antonio Bernardo SIRGO
c/Pepita F. Duro, 1
E - LA FELGUERA-LANGREO

(E12)
Adaptation and development of CAD/CAM programmes in the clothing industry.
Contact person:
M. F. J. SEGUI DE LA RIVA
Centro Superior de Diseno de Moda
c/Isaac Peral, s/n
E - 28040 MADRID

(E13)
Simulation model for the taking of strategic decisions.
Contact person:
M. Carlos GARCIA SANCHIS
Querol, S.A.
c/Gran Via Marqués del Turia 55
E - 46005 VALENCIA

(E14)
Introduction to new technologies.
Contact person:
Jose Luis HUERTAS TALON
c/Corona de Aragon, 35
E - 50009 ZARAGOZA

(E15)
Informatics workshops.
Contact person:
Raul AVILA CRUZ
Instituto de Formaciòn y Estudios Sociales
c/ Alenza, 4, 5°
E - 28003 MADRID

FRANCE

(F1)
Production technology. Youth from 16 to 25 years of age.
Contact person:
M. Bernard HARTMANN
ACEREP - CMFIP
rue Violet, 3
F - 25000 BESANCON

(F2)
Network "Young people and technologies".
Contact person:
Mme Eliane CLIFIT-MINOT
Réseau "Jeunes et Technologie" /
Cité des Sciences et de l'Industrie
211, Avenue Jean-Jaurès
F - 75019 PARIS

(F3)
New qualifications.
Contact person:
M. M. ANDRIEU
Délégation Interministérielle à l'insertion professionnelle et sociale des jeunes en difficulté
71, Rue Saint Dominique
F - 75007 PARIS

(F4)
Individualised training and pedagogical follow-up by telematics, reconversion of SME-SMI.
Contact person:
M. François SANGUESA
A.F.P.A. Agence Régionale
rue de la République, 21
BP 99
F - 25013 BESANCON Cédex

(F5)
Nuclear plant maintenance
GRETA - AFPA
Contact person:
Mme Muriel PENICAUD
Délégation Régionale à la Formation Professionnelle
7, rue du 11 Novembre
F - 14038 CAEN Cédex

(F7)
Introduction of micro-informatics and production technology in enterprises.
Contact person:
M. DEROUVRAY
Syndicat des Constructeurs de Pompes
Av. Hoche 10
F - 75382 PARIS Cédex 08

(F8)
Training in advanced automation and robotics.
Contact persons:
M. G. LIEGEOIS / Mme. M. STUCKENS
INSA
Laboratoire Automatique Industrielle
Bât. 303
Av. A. Einstein, 20
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(F9)
Pilot scheme for support training in founding cooperative production societies which are technologically innovating.
Contact person:
M. Michel PORTA
C.G.S.C.O.P.
rue Michel Leclaire, 37
F - 75017 PARIS

(F10)
Development of high tech enterprises - METAGORA.
Contact person:
M. Michel WEILL
Secrétariat Général aux Affaires Régionales
34, rue Casimir Perier
B.P. 2001
F - 69228 LYON Cédex 02

(F11)
Modernization of craftsmen
Contact person:
M. Pierre PERROT
Chambre des Métiers de la Haute-Savoie
16, Rue Guillaume-Fichet
BP 15
F - 74011 ANNECY Cédex

(F12)
Automatics, robotics and security, large aeronautical enterprises and subcontracting.
Contact person:
M. M. DEBEINE
Union des Industries Métallurgiques et Minières
56, Avenue de Wagram
F - 75008 PARIS

(F13)
Modernisation of subcontracting in aeronautics and automobile industry.
Contact person:
M. Jean-Jacques MARTY
Maison de la Métallurgie
40, Avenue Maryse-Bastié
F - 33520 BRUGES-BORDEAUX

(F14)
Quality control - SME-SMI.
Contact person:
M. PEYSSON
A.F.I.L.
5 bis, Boulevard Karl Marx
F - 42031 SAINT ETIENNE Cédex 02

(Fc1)
Transforming training into investment for individuals and enterprises.
Contact persons:
Mme Monique BAUDOIN, M. Gilles DELAHAYE
G.F.C. - B.T.P.
6, Rue Beaubourg
F - 75004 PARIS

(Fc2)
Individualisation and modular training of the skilled and highly skilled workers.
Contact person:
M. M. OLEKSIAK
B.T.P.
B.P. 45
17, Rue de l'Apprentissage
F - 42002 SAINT ETIENNE Cédex 1

(Fc3)
Higher training of trainers in the building branch.
Contact person:
M. Daniel SOIDET
C.C.C.A.
7, Rue du Douanier-Rousseau
F - 75014 PARIS

(Fc4)
Vocational qualification of technicians in heating and ventilating engineering.
Contact person:
M. Jean-Paul MONIER
Centre de Formation du Bâtiment
2 - 4 Rue Louis Dabert
F - 63000 CLERMONT FERRAND

GREECE

(GR1)
OAED
Contact person:
M. Tselepis PANAJOTIS
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6 Dodekanissou Str.
GR - 17456 ATHENS

(GR2)
Hellenic red cross
Contact person:
M. Ioannou VASSILIOS
1 Lukavizos Str.
GR - 10672 ATHENS

(GR3)
Greek Mathematical Society
Contact person:
M. Salaris KOSTAS
34 Panepistimiou Str.
GR - ATHENS

(GR4)
Hellenic Centre of Productivity
(ELKEPA)
Contact person:
M. KODONAS
ELKEPA
28 Kapodistriou Str.
GR - 10682 ATHENS

(GR5)
Agricultural bank of Greece (ATE).
Contact person:
M. N. PITARAS
11 Solonos Str.
GR - ATHENS

(GR6)
Economic Research Centre for a
School of Economic and Commercial
Sciences (ASOEE).
Contact person:
M. P. PAPAKYRIASIS
46 Kerhalinias Str.
GR - 11251 ATHENS

(GR7)
Vocational Programmes on New
Technology of the Ministry of
Education.
Contact person:
M. HOURMOUSIADIS
15 Metropoleos Str.
GR - 10185 ATHENS

ITALY

(I1)
Experimental programme of distance learning.
Contact person:
Mme. Lidia SCOPPIO
Ministero del Lavoro e della Previdenza sociale
D.G. OAPL Div. I
Castelfidardo 43
I - 00185 ROMA

(I2)
Project for distance training for managers (CNITE).
Contact person:
M. Giorgio PANIZZI
C N I T E
Via Marche 84
I - 00187 ROMA

(I3)
Project for CAD/CAM operators.
Contact person:
M. Rocco GARCEA
IFOA
Via G. D'Arezzo 6
I - 42100 REGGIO EMILIA

(I4)
Project CIM for operators and managers in SME.
Contact person:
M. Luigi GERMANETTO
CSEA
Via Ventimiglia 201
I - 10127 TORINO

(I5)
Project for the application of new information technologies to SME.
Contact person:
M. Vincenzo PIAZZA
ANCIFAP
Piazza della Repubblica 59
I - 00185 ROMA

(I6)
Project "Mechatronics" for CNC Operators.
Contact person:
M. Glauco BOUCHE
Ministero della Pubblica Istruzione
D.G. Istruzione Professionale
Via Carcani 5
I - 00153 ROMA

(I7)
Project for junior staff responsible for data processing systems in SME.
Contact person:
M. Bruno PACQUOLA
Centro Polo
Via Torino 63
I - 30170 MESTRE

(I8)
Project for micro-processor technicians (ENAIP).
Contact person:
M. Pasquale CICCHELLA
ENAIP
Via Ventura 4
I - 20134 MILANO

(I9)
Project "TRIALOGUE" for the economic/management sector.
Contact person:
Mme Marta GENOVIE DE VITA
Ministero della Pubblica Istruzione
Via Trastevere
I - 00153 ROMA

(Ic1)
Training scheme for technical and administrative management of a market.
Training scheme for rehabilitation interventions.
Contact person:
Mme Rosella MARTINO
FORMEDIL
Via Guattani 24
I - 00161 ROMA

(Ic2)
Project for construction and
territory technicians.
Contact person:
M. G. BELLI CONTARINI
Min. della Pubblica Instruzione
D.G. Istruzione Tecnica
Via Trastevere
I - 00153 ROMA

IRELAND

(IRL1)
Skills foundation programme.
Contact person:
Mrs Miriam CONWAY
FAS
The Training and Employment Authority
P.O. Box 456
IRL - DUBLIN 4

(IRL2)
Women into technology.
Contact person:
Mrs Mary Dorgan
FAS
The Training and Employment Authority
Upper Baggot Street 27-33
IRL - DUBLIN 4

(IRL3)
Automated office procedures.
Contact person:
Mr Brian FIELDS
FAS Training Centre Baldoyle
Baldoyle Industrial Estate
Baldoyle
IRL - DUBLIN 13

(IRL4)
Plastics and Polymer extrusion and moulding technology.
Contact person:
Mr Peter TIERNAN
FAS
The Training and Employment Authority
Ballytivnan
IRL - SLIGO

(IRL5)
New technology skills.
Contact person:
Mr Brian FIELDS
FAS Training Centre
Baldoyle Industrial Estate
Baldoyle
IRL - DUBLIN 13

(IRL6)
Industry linked Control Technology.
Contact person:
Mr E. CURRIVAN
School Insp. Office
Crawford Municipal Art Gallery
Emmet Place
IRL - CORK

(IRL7)
Database/Information technology.
Contact person:
Mrs Catherine HARNEY
Dep. of Education
Hawkins House, 11th Floor
Hawkins Street
IRL - DUBLIN 2

(IRL8)
Centre for Business Microsystems / Applications.
Contact person:
Mr Joseph CODYRE
Dept. of Education
Hawkins House
Hawkins Street
IRL - DUBLIN 2

(IRL9)
Training of trainers
Contact person:
Mr Christopher CONNOLLY
College of Technology
Bolton Street
IRL - DUBLIN 1

(IRL10)
The young workers innovation programme.
Contact person:
Mr Torlach O'CONNOR
Dept. of Education
Marlborough Street
IRL - DUBLIN 1

(IRL11)
Applications of interactive videodisc to training.
Contact person:
Mr Bernard MERRIMAN
FAS
The Industrial Training Authority
Upper Baggot Street 27-33
P.O. Box 456
IRL - DUBLIN 4

(IRLc1)
Provision of safety training packages for use by trainers.
Contact person:
Mr Mc CABE
Constr. Ind. Federation
Federation House
Canal Road
IRL - DUBLIN 6

(IRL12)
Development of SMEs through integrated local community efforts.
Contact person:
Mr Denis ROWAN
FAS
The Industrial Training Authority
Upper Baggot Street, 27-33
IRL - DUBLIN 4

LUXEMBOURG

(L1)
Data processing and bookkeeping.
Contact person:
M. Raymond BISDORFF
Ministère de l'Education Nationale
et de la Jeunesse
Boulevard Royal, 6
L - 2910 LUXEMBOURG

(L2)
Design and writing of management applications with software.
Contact person:
M. Silverio NINO
Ministère de l'Education Nationale
et de la Jeunesse
Boulevard Royal, 6
L - 2910 LUXEMBOURG

(L3)
Automatically programmed tools for technicians.
Contact person:
M. Fernand FEHLEN
Avenue Pasteur, 98
L - 2310 LUXEMBOURG

(L4)
Information technology in colleges of agriculture and in the in-service training of farmers.
Contact person:
M. Paul SMITZ
Ecole d'Agriculture
BP 76
L - ETTELBRUCK

(L5)
The hotel data processing system of the Diekirch hotel and catering college.
Contact person:
M. ROBERT et M. LACAF
Lycée Technique Hôtelier
rue Joseph Merten
L - 9257 DIEKIRCH

THE NETHERLANDS

(NL1)
Regional Centre, pilot project mechanical engineering.
Contact person:
Mr E. ROELOFS
Regionaal Centrum Twente
Cath. v. Renneslaan 35
NL - 7604 KV ALMELO

(NL2)
The Mantel project.
Contact person:
Mrs WESTERHUIS
P.C.B.B.
Postbus 1585
NL - 5200 BP s'HERTOGENBOSCH

(NL3)
Introduction to CNC training at the government for vocational training of adults.
Contact person:
Mr van der LUBBE
Ministerie van Sociale Zaken
en Werkgegenheid / DG. ARBVO
Visseringlaan 26
NL - RIJSWIJK

(NL4)
Introduction of office automation in 9 government centres for administrative vocational training for adults.
Contact person:
Mr H.J. BORST
Bureau Extra Murale Scholing
Ministerie van Sociale Zaken
DG. ARBVO
Visseringlaan 26
NL - RIJSWIJK

(NL5)
Alida de Jong school / Vocational training project for women.
Contact person:
Mrs S. van HOEK
Alida de Jong School
Mariaplaats 4
NL - 3511 LH UTRECHT

(NL6)
Vocational training plan.
Contact person:
M. CADERIUS
R.E.C.O.G.
Titanstraat 28
NL - 9665 HZ OUDE PEKELA

(NL7)
I.S.I. Project
Contact person:
Mr KEEP
P.C.B.B.
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(NL8)
Robotics and flexible automation laboratory.
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(NL9)
Development of apprentices.
Contact person:
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(NL10)
The BONO project.
Contact person:
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(NLc1)
Reform training examination system (HOE).
Contact persons:
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NL - 2516 BA 's GRAVENHAGE

(NLc2)
Training of engine-drivers on computers in the building sector.
Contact person:
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NL - 2800 AG GOUDA

PORTUGAL

(P1)
Introduction to data processing in agricultural management and accountancy.
Contact person:
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P - 2500 CALDAS DA RAINHA

(P2)
Training of CAD/CAM operators for the Ceramics industry.
Contact person:
M. José Luis DE ALMEIDA SILVA
Centro de Formaçao Profissional para a Industria Ceramica
rua Luis Caldas
P - 2500 CALDAS DA RAINHA

(P3)
Sensibilization to new technologies in the Textile Industry.
Contact person:
Carlos Manuel PEREIRA FONTES
Centro Form. Prof.
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rua Prof. R. dos Santos, lot 150,
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(P4)
Administrative computerization.
Contact person:
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(P5)
Introduction to computer for long distance learning.
Contact person:
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Centro de Formaçao Tecnica
Azinhaga dos Lameiros
P - 1699 LISBOA Codex

(P6)
Self-training for technicians in Telecom.
Contact person:
M. Matos DOS SANTOS
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P - 1900 LISBOA

(P7)
Video computer interaction in training.
Contact person:
M. Antonio MODERNO
Universidade de Aveiro
Dpt. Didactics and Technology
Av. Calouste Gulbenkian
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(Pc1)
The use of computers in the Building industry.
Contact person:
Mme. Manuela LEMOS
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Rua Alvares Cabral 309 1°
P - 1000 PORTO

UNITED KINGDOM

(GB1)
ITEC training materials network.
Contact person:
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189 Freston Road
UK - LONDON W10 6TH

(GB2)
Micro-systems Advice &
Training Centre.
Contact person:
Mr Roy STEPNEY
Calderdale Business and
Innovation Centre
Dean Clough Industrial Part
UK - HALIFAX HX3 5AX

(GB3)
Computer Integrated Manufacture for Engineers in manufacturing industry.
Contact person:
Mr R. ZIARATI
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Higher Education
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(GB4)
Women in technology (Model II).
Contact person:
Mrs Ailsa SWARBRICK
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Fairfax House
Merrion Street
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(GB5)
Home delivered training in information technologies vocational skills.
Contact person:
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Asphalte House
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(GB6)
OpenTech project in computer aided engineering.
Contact person:
Mr Mike EVANS
Open Tech Unit
Sandwell College of Further
and Higher Education
Pound Road, Oldbury
UK - WARLEY, SANDWELL (West Midlands)

(GB7)
Higher national diploma in computer aided engineering.
Contact person:
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(GB8)
Higher national certificate in electronic engineering.
Contact person:
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Electronic Engineering
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(GB10)
Camden ITEC project.
Contact person:
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(GB11)
London computer and electronics school.
Contact person:
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Glenthorn House
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UK - LONDON W6 0ND

(GB12)
Women's technology centre.
Contact person:
Mrs Marie KANE
Women's Technology Centre
Stirling District Council
Municipal Buildings
UK - STIRLING FK8 2HU

(GBc1)
Open learning Packages for building craft trainees and Site management interactive video - "What a site!"
Contact person:
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Constr. Ind. Training Board
Bircham Newton
Kings Lynn
UK - NORFOLK PE31 6RH