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**CENTRE *for*
EDUCATIONAL
SOCIOLOGY**

**MODULARISATION IN INITIAL
VOCATIONAL TRAINING: RECENT
DEVELOPMENTS IN SIX EUROPEAN
COUNTRIES**

The University of Edinburgh

**MODULARISATION IN INITIAL VOCATIONAL
TRAINING: RECENT DEVELOPMENTS
IN SIX EUROPEAN COUNTRIES**

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SUMMARY

This report reviews the experience of modularisation in initial vocational training in six EC countries.

Relatively few innovations in initial training in Germany have employed modular concepts (chapter 2). Some large companies and vocational schools have introduced modules in their respective sides of the dual system. Many of these innovations have pursued pedagogical objectives, in particular to provide opportunities for self-regulated learning.

In Spain one-year vocational modules at EC levels 2 and 3 are planned for students leaving compulsory secondary education and baccalaureate study respectively, as part of a national reform of the education system to be implemented in the 1990s (chapter 3). The reforms are intended to modernise the system and increase its responsiveness to changing skill needs. A third set of modules is planned for students who experience difficulties within compulsory general education.

The French Credit Formation Individualisé (CFI) was introduced in 1989 primarily to enable unemployed unqualified young people to obtain French level 5 qualifications and stable employment (chapter 4). The CFI offers modular training, organised on a territorial basis. It is designed to provide individualised training routes based on the interests, needs and circumstances of each student.

The Certificat d'Initiation Technique et Professionnel (CITP), to be introduced in Luxembourg in 1992, will be partly modular (chapter 5). The CITP is designed for young people whose social, linguistic or other disadvantages make it difficult for them to achieve EC level 2 qualifications through conventional routes.

In the Netherlands, modular KMBO (short full-time) courses were introduced in 1979 for dropouts and other disadvantaged 16-18 year olds (chapter 6). Modularisation is now being considered for MBO (longer full-time) courses which have recently been integrated with KMBO. A process of modularisation of apprenticeships has now covered half the occupational fields, including the largest ones. The objectives of modularisation have varied across courses and over time, with a partial shift in emphasis from thematic or activity-based units to manageable learning steps.

Nearly all vocational education and training in Scotland (below university degree level) has been modularised since 1984 (chapter 7). The National Certificate (NC), a single national framework of modules, covers initial and continuing vocational education; the modules are studied by young people in both full-time education (including secondary school) and part-time education (including apprenticeships and training schemes). The modular reforms have pursued a range of objectives, with a particular emphasis on increasing the coherence of an institutionally diverse system.

Chapter 8 compares the experience of modularisation in initial vocational education and training across the six countries. Most countries have only limited, and recent, experience of modularisation, at least with respect to national programmes; courses with close links to continuing (adult) training, and courses for disadvantaged students, have most frequently been modularised; concepts of modules, and the design of modular systems, vary widely across and within countries; most modular reforms pursue surprisingly similar sets of objectives, even if their emphases and strategies differ; different modular reforms focus primarily on disadvantaged students, on skills, and on the education/training system respectively; and differences in the design of modular systems are only weakly related to differences in their objectives. The experience of modular reform raises various issues concerning flexibility, quality, institutional change, the role and training of teachers, and the organisation and coherence of education and training systems.

Chapter 1

INTRODUCTION

Modularisation has frequently been advocated as a means to reform and modernise initial vocational education and training (VET), to diversify VET provision, to make it more flexible and responsive to economic, technological and social change, and to improve its coherence and efficiency as a system. Several recent national and regional reforms, and many local initiatives, have involved the introduction and development of modules. Action 2 of the EC Petra 2 programme, which came into force in January 1992, provides support for transnational cooperation activities aimed at the joint implementation of vocational training modules or the joint training of trainers. Consequently there is considerable interest in modular reform, and Petra has helped to focus this interest on initial VET.

This interest gives rise to several questions about the experience of modular reforms. How widespread is the use of modules in initial VET in EC countries? When were they introduced? What types of courses, for what types of students, have been modularised? How are modules and modular systems designed? What are the objectives and strategies of modular reforms? Surprisingly little is known, systematically, about the answers to these questions. Even less is known about the effectiveness of modular reforms, about their consequences (intended or otherwise) or about the practical issues raised in their introduction.

This report cannot fill all these gaps in our knowledge, but it hopes to make a significant step in this direction. It is the first collective product of a research partnership which is continuing to examine the practical and other issues raised by the experience of modular reforms.

Institutes from six countries (Germany, Spain, France, Luxembourg, the Netherlands and Scotland (United Kingdom)) participated in theme 8 of the PETRA Research Partnerships, on The Effectiveness of New Curriculum Models for Initial Vocational Training. These six countries were, in part, self-selected on the basis of policy and other interest in the topic, although we are aware of interest among other EC countries as well. The participating institutes are listed in Appendix A. At our first partnership meeting, in October 1991, we decided to focus on modularisation as the subject of our research. Rather than split into smaller partnerships, as is usual with Petra Research Partnerships, we elected to continue as a large partnership of six. Given the relatively limited knowledge of modularisation in Europe, we felt that we could achieve more if we compared the experiences of a relatively large group of countries.

Our main work in the first year of the partnership was to prepare studies of the experience of modularisation in each of the six countries. These studies were produced in response to a common list of questions that had been agreed among the partners. This facilitated subsequent comparison and synthesis of the country studies. The questions are reproduced in Appendix B, although for the sake of brevity the accompanying commentary has been omitted. Each country study was written by the researcher(s) from the institute from the country concerned. However, partners worked in pairs, linking Germany and Luxembourg, Spain and France, and the Netherlands and Scotland. Each partner could make comments, ask questions, and offer new insights into the modular reforms covered by the paired partner's study, on the basis of preliminary drafts and of study visits to the partner's country.

In April 1992 all six partners met to discuss drafts of the country studies, and to suggest revisions and additions. Subsequently two versions of each study were produced: a full-length version, available from the authoring institute (see Appendix C), and a shorter summary. These shorter versions form the backbone of this report and are contained in chapters 2 to 7 below.

The April meeting also discussed themes and issues raised by a comparison of the country studies. It responded to a draft paper prepared by the coordinator of the partnership; this has since been rewritten and expanded to form the overview in chapter 8.

In its second year (1992/3) the partnership plans to investigate in greater depth the practical issues and problems faced by countries introducing modular reforms.

Chapter 2

GERMANY

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2.1 CONTEXT

Within the German system of education, modular structures are at present represented primarily in further vocational training. In initial vocational training on the other hand, while modules are certainly used in the organisation of content and method, their place is mainly within an already established framework of training; they do not lead to certificates in their own right.

A principal reason for the modest development of modular training concepts so far is to be found above all in structures that are long established as legal requirements of the German system of vocational training. These are characterised by a form of vocational training that is organised in a system of specific types and length of course which lead to final examinations marking nationally recognised qualifications. While the system can readily embrace new didactic and methodological ways of structuring content (fields of study, etc), this does not easily extend to a greater flexibility of the basic structure as a whole.

2.2 CHARACTERISTICS AND OBJECTIVES OF MODULARISATION

The extension of modular training

The term 'module' is not so far used in the training regulations and outline curricula for recognised trades and professions based on courses of training. Nevertheless, the prerequisites are there for allowing modular training concepts to be adopted within initial vocational training. This is evident particularly in the following cases:

- Where, for newly systematised (modern) trades and professions, the training regulations present a clear demarcation in basic, advanced and special training and thus facilitate the application of flexible forms of training. These involve fundamental content requirements respecting the communication of skills and knowledge, this being structured according to matter and length of course. The sequence, arrangement and also the didactic and methodological organisation of the courses are left to the specialised competence of the training staff.
- Where training centres are situated in large firms whose activities involve an extensive technological and organisational division of labour. In small and medium-sized firms, on the other hand, and also in servicing establishments, modular forms of training are difficult to organise, because the content and arrangement of the courses are influenced by, for instance, restrictive customer requirements, seasonal factors and so on. In this area, training modules are best developed and operated in limited courses of training which are run on a cooperative basis in training centres shared by several firms.

Vocational training schools face conditions that differ from the above. Their curricular structures (subdivided according to subjects, stages of learning and learning units) do certainly permit modular forms of training. Nevertheless a greater compactness of information and knowledge is demanded than in courses of training centred on firms. The result is that receptive forms of learning dominate along with established concepts of instruction that have evolved over a long period and are subsequently difficult to overcome.

Motives and aims of modularisation

The application of modularisation in initial vocational training is inseparably linked with other modern concepts of learning. These start out from the demands made by new types of qualification associated with the interaction of modern technology and ways of organising the work process. In initial vocational training, parallel to imparting specialised skills, forms of qualification are now required that will cover different occupations, which can be applied flexibly and which will generate self-reliant activity on the part of the trainee.

Modern concepts of learning are expected to engender the competence to take responsibility and to plan, implement and monitor activities unaided. At the same time, the applicability of qualifications to different occupations (e.g. within a specific trade or profession) increases the flexibility and versatile utilisation of knowledge and skills in the firm or occupation.

Definition and characteristics of modules

There is no generally valid concept of modular training in the German system of vocational training, and there is also no accepted definition of it. Based on practical experience, the following features may be suggested as a working definition.

Modules are learning units which are put together on a basis of subject, pedagogical and didactic needs, and which may be combined in different ways and varied chronologically. They can be structured according to the work techniques involved or as component parts of a qualification, according to training segments (e.g. basic or advanced module) or according to any one complex of activity. They permit flexibility in the way the training is structured, so as to take account of individual achievement potential. Their methodical arrangement of the various learning ingredients promotes activity-orientated learning as well as the acquisition of basic qualifications.

Modules are developed mainly in the context of new methods of teaching and learning, particular examples being the project method and 'Leittext' (Guide) method. Common to both is a basic conception of activity-orientated, self-regulated learning.

- The project method centres on a specific work assignment. The trainees have to carry out the task in question within a team, planning, implementing and evaluating the work independently. Thus they acquire abilities and skills in a complex process of training.
- The 'Leittext' (Guide) method aims to give guidance in acquiring self-reliance in the activity of a specific occupation. The learning process is organised as the model of a completed action: Inform -> Plan -> Decide -> Execute -> Monitor -> Evaluate. Training assignments are formulated as tasks capable of being accomplished. Within the framework of the course, the trainees have to acquire the information and capacity to take the particular steps needed, while the 'Leittext' (Guide) provides them with the help and orientation they require for this.

Examples of how these approaches may be combined are offered by the company-based training provided by TELEKOM and SIEMENS and the vocational school training at the Advanced Education and Training Centre (Oberstufenzentrum - OSZ) for communications engineering in Berlin. (See Appendix)

Responsibility for the development of training modules

A practice typical of German vocational training is that innovations are first tested in the form of trial experiments, these being invariably accompanied by scientific research. The principal

partner for the latter is the Federal Institute for Vocational Training (Bundesinstitut für Berufsbildung - BIBB). The introduction of modularised training at TELEKOM serves as an example of this approach.

There are, however, no unified patterns or viewpoints that determine how training modules are worked out. The approaches on which such structures are based have resulted from, for instance, the initiatives of training staff, research institutions or units associated with particular firms, the vocational training authorities of the various federal states.

As an example, the Institute for Vocational Development Ltd (Institut für berufliche Entwicklung - IBE) in Berlin, for instance, develops and distributes training modules in a number of different fields (including the training areas of wood and building technology and for the electrical and metalworking trades).

There is not much in the way of an exchange of experience among those who initiate and operate modular or other new training concepts, at all events little that extends beyond individual institutions or regions. In many cases the firms or vocational schools simply take over ideas or individual components (in the context of the marketing of modules) and apply these in forms adapted to their respective practical training needs.

2.3 PROBLEMS AND CONSEQUENCES OF MODULARISATION

The implications of modularisation are mainly to be seen in the didactic and methodological aspects of training.

The role of training staff

Implementing modular training and other modern learning concepts within vocational training makes considerable demands on those involved, particularly on the training staff. Their expertise has to be extended within a short time far beyond the limits of their original specialism. In addition they have to take on new roles as advisers and moderators in the training process.

For this reason special training programmes are being developed and tested to prepare the teaching staff and to give them support in this work. In the case of TELEKOM, for example, two-week courses have been organised in order to familiarise the trainers with the structure and requirements of the MAUSY project.

The attitudes of those involved

The trainees themselves appreciate the active role which modular training gives them. Nevertheless, some difficulties have been experienced, particularly at the start, relating to the independent planning of the training process and self-reliant evaluation of the results.

The relative degree of freedom offered by modularisation has on occasion caused trainees to feel that too little was demanded of them. The criticism was indeed sometimes voiced that in modular projects more time was devoted to the pleasures of discussion than to developing solid practical skills.

However, aspects such as these need to be understood in the context of substantial levels of expectation. At the training centres considered in detail, the trainees at all events showed themselves to be of a high standard and well motivated.

2.4 CRITERIA OF EFFECTIVENESS

A number of criteria need to be taken into account in assessing the effectiveness of modular training as of other new concepts:

- In the first instance, the criterion of quality needs to be the one already established in consequence of the success of the existing traditions of vocational training. Reliable specialised knowledge, solid skills and work discipline are values which may be expanded by introducing new individualised concepts of training, but which must not be either displaced or adversely affected by them.
- A relevant factor is the degree of applicability of the newly acquired qualifications in the work of the firm in question. In cases where skills acquired in the course of activity-orientated learning and the self-reliant solving of problems are in demand at the workplace, the advantages of modular and other modern concepts of training make themselves felt; in other cases the effect is not so obvious.
- Finally, an important criterion for judging the effectiveness of modular training is to take account of the differentiated learning needs and interests of those being trained. Among other aspects, the trial experiment at TELEKOM demonstrated the capacity of modular forms to take variations in the speed of learning into consideration (including the opportunity they give trainees of above-average achievement to complete their courses early), a factor of advantage both for the individual and for the management of firms.

APPENDIX

Examples of the practical application of new curriculum models/modularisation

TELEKOM

In the field of telecommunication engineering at TELEKOM, the traditional training, which was organised on the basis of separate course units, has given way to subject-overlapping projects or modular forms of training. In the case of the trial experiment 'MAUSY' (module training system - 'Modulausbildungssystem'), modules are equated with projects or subjects, which may in turn be defined as work assignments, pieces of work, investigations or tasks. They are divided up into three groups:

- basic module (for approx. 70% of the period of training)
- supplementary module (to extend the training)
- compensatory module (to make up for any parts of the course that may have been missed)

The completion of one module takes on average 20 to 30 hours.

By means of a careful selection of modules offered, it is also possible to allow for differences in levels of school attainment and in the learning tempo of the participating trainees. In the final outcome the modules chosen must be able to take account of all the qualifications required in the training directives.

The TELEKOM modules represent a flexible manner of organising training. This is characterised by tasks relevant to several qualifications within the one module and, between

modules, by individual possibilities for how they are selected and combined. On the other hand, even in the framework of training within one firm, these modules have no individual status in their own right as part qualifications.

SIEMENS

In offering a trial experiment in project and transfer-orientated training under the designation 'PETRA' (not to be confused with the EC programme!), SIEMENS has also set new standards in vocational training.

The objective in this case is again the development of both specialised and overlapping qualifications. It centres on self-regulated learning, which is supported by guidance questions and texts and by other work facilities. Exercises set to be carried out in various forms of individual or group work are divided into 6 working operations. These are:

1. To inform (related to tasks/objectives, and new contents)
2. To plan (the learner plans the working steps and means needed)
3. To decide (about procedure, together with the trainer)
4. To execute (the task in question)
5. To monitor (both learner and trainer assess the work done)
6. To evaluate (trainer and learner consider the results in a final talk).

There is not the degree of modular flexibility that characterises the trial experiment at TELEKOM, but it is nevertheless potentially present.

OSZ

The Advanced Education and Training Centre (Oberstufenzentrum - OSZ) in Berlin has developed a concept of instruction for vocational training schools with a bias towards problem-orientation and activity-orientation. At the present time a pilot project is being tried out on an experimental basis, centred on a model designated 'PAULE' (pedagogical working group in further vocational training in the electronics field - 'Pädagogische Arbeitsgruppe zur Lehrfortbildung Elektro'). Its basis is a subject-overlapping sequence, each week of which has three phases:

- In the orientation phase the trainees get to know the assignment and, together with the trainer, set out the plan of work on a weekly basis.
- In the implementation phase the trainees, with the help of information sheets, guidance questions and textbooks, do the planning and theoretical analysis of the job of work and then actually carry it out - all of it for the most part on their own.
- The monitoring phase is for an evaluation conducted by the trainees themselves, along with evaluation and checking by the trainer (test).

In this concept the material is subdivided into learning units or areas, although these are conceived to run in sequence in a fixed succession. More room for a flexible application of learning units is allowed for in the laboratory - an opportunity for modularisation of which, however, little use is made.

Chapter 3

SPAIN

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3.1 CONTEXT

Nowadays in Spain students receive a common education up to the age of 14 (*Enseñanza General Básica = EGB*).

Training of youths and adults for their entry to the labour force has been done in Spain in two different ways:

- Through the educational system (*Regulated Vocational Training*) when the student ends his general education (at the age of 14). It lasts for 5 years divided in two periods:
 - First Grade (FP-1) : students aged 14 to 16
 - Second Grade (FP-2) : students aged 16 to 19

The *Ministerio de Educación y Ciencia* (Ministry of Education) is in charge of it, along with other authorised private educational centres which are supervised by the Ministry.

- Outside the educational system (*Occupational Vocational Training*), focused on adults. This consists of short courses (less than a year) to train people to make them able to work at a very specific job.

The *Ministerio de Trabajo* (Ministry of Employment), through the *Instituto Nacional de Empleo* (a national institution in charge of employment), is responsible for its development.

The speed at which social and technological changes are taking place in developed countries has created an important challenge to educational institutions. Therefore, Spain is affected by them and, at the same time, it is also affected by a process of modernization of its production structure (a consequence of joining the EC) which makes it necessary for it to face the new *qualification needs* of its labour force.

The Ministry of Education is in the middle of changing the general educational system, in particular the *Regulated Vocational Training*.

The vocational training model aimed at through the reform of the educational system consists of two formative components:

- *Basic Vocational Training*, which includes a set of basic knowledge, aptitudes and abilities related to a large range of occupations. Therefore, it does not include studies specifically focused on a particular occupation, but includes general studies (Language, Mathematics, Natural Sciences, Foreign Languages, General Technology, etc.).
- *Specific Vocational Training*, which stands for a set of contents and skills needed to fill out job posts with a varying degree of affinity. The structure of this training must have a 'MODULAR' character; it must be provided by a short-cycle training module with narrowly defined contents for each profession.

Specific Vocational Training is organised at two levels:

- MIDDLE LEVEL VOCATIONAL TRAINING (*Level 2*)
- UPPER LEVEL VOCATIONAL TRAINING (*Level 3*)

3.2 CHARACTERISTICS AND OBJECTIVES OF MODULARISATION

The scope of reform

The Spanish experience of modularisation is exclusively based on MIDDLE LEVEL and UPPER LEVEL VOCATIONAL TRAINING (*Level 2* and *Level 3*) of the future Educational system. It was started in the academic year 1988-89 (with few students) and during 1990-91 the following students took part:

MIDDLE LEVEL VOCATIONAL TRAINING (*Level 2*)

. Students involved	1,350
. Number of groups	85
. Ratio	15.88

The groups of students were distributed through different production sectors: *Agriculture, Trade, Electricity, Chemistry, Mechanics, Health.*

UPPER LEVEL VOCATIONAL TRAINING (*Level 3*)

. Number of students	2,545
. Number of groups	130
. Ratio	19.57

The different production sectors through which the students were distributed are: *Services, Mechanics, Electronics, Management, Image and Sound and Hotel trade.*

Objectives of modularisation

- To respond quickly to the demands of the productive system, providing people (young or adult) with the knowledge, skills and abilities needed to achieve European and international qualification levels.
- To make permanent training and promotion to higher level qualifications possible for everyone.
- To respond to the expectations of individuals, increasing their ability to adapt when they face changes in demand in the labour market.

Characteristics of modularisation

The new educational system will be implemented gradually between 1992-2000. In this new educational system, *Vocational Training* is based on a model that can meet the needs, present and future, of rapid technological change - quick changes in occupational qualifications. This model must be **flexible** and with possibilities for **permanent remodelling**; in this way, it will be able to maintain a close link with the production system without having to change the whole educational system each time it is updated.

The Ministry of Education thinks that the features required for this type of Vocational Training can be achieved by means of a **modular education**.

This modular education is organised in different practical and theoretical knowledge areas which enable people to acquire the capacities needed in each job. In this way, the training aims of each area can be defined more accurately.

The modular structure for a particular job involves two different but related types of training:

1. Training in Educational Centres, which includes several areas of specialisation in each different job.
2. Training in Job Centres, which includes programmed practices between the Educational and Job Centres by means of previously established agreements.

The duration of this training period is variable in each case, but the general tendency is to develop it in a period of time which does not exceed one academic year.

Definition and design of modules

By 'Professional Module' we refer to the teaching of knowledge and skills - organised in *areas* which group practical and theoretic contents - that enable young people to acquire the abilities needed for a certain job.

These Professional Modules are generally one year long and their contents and categories are established according to *Levels 2 and 3* from the Annex of the Decision of the European Council dated the 16th of July 1985 (85/368/EEC).

The structure and features of each Professional Module (approved on an experimental basis by the Spanish Ministry of Education) are described in a **Basic Document** in which the following aspects are established:

1. *Occupational Field* corresponding to initial training.
2. Description of *Occupational Features*, specifying the most significant activities.
3. Minimum *length of time* (in hours).
4. *Training at the Educational Centre*, divided in 'knowledge Areas'. For each Area will be specified:
 - General aims
 - Contents
 - Length of time
5. *Training at the Job Centre*, which will specify:
 - General aim
 - Activities which will take place
 - Length of time
6. Requirements for students' *access*.

One of the features of the arrangement of initial vocational training into Professional Modules is the obligatory inclusion of *Training at Job Centres* (up to now this training was optional). This enables students to become familiar with the most advanced technical equipment, production techniques and the general atmosphere at work. This will surely make easier their transition from the Educational Centre to the world of work.

The actual Professional Modules - which are, as already indicated, an experimental pilot for the future MIDDLE LEVEL VOCATIONAL TRAINING (*Level 2*) and UPPER LEVEL VOCATIONAL TRAINING (*Level 3*) - have been designed and developed by a team of experts from the Spanish Ministry of Education. This team detected certain educational needs which were related to needs in the different production sectors.

In this way, approximately 50 Professional Modules (*Level 2 + Level 3*) have been developed and with them, the approach to 'modularisation' is being implemented.

3.3 PROBLEMS, CONSEQUENCES AND IMPLICATIONS OF MODULARISATION

Access to Modules

Access to Professional Modules is direct if the student has the required academic level; in other words, when he has finished 'secondary education' (for *Level 2*) or the 'Baccalaureate' (for *Level 3*).

If we allow for the fact that Professional Modules are not just designed to train young people (so that they can join the workforce) but are also designed to provide or improve the vocational qualifications of present workers, access to them must also be possible for people with a different academic level from that required by the educational system. Therefore, access to Professional Modules must not be denied to any present or future worker who may benefit from them.

The main problem related to this second way of access to Professional Modules is to establish the '*entry requirements*' which can be considered as a valid alternative to the academic levels previously mentioned.

The Spanish Ministry of Education will establish these requirements in each case. The candidate must show he meets them in an **Access Test** that takes into consideration his knowledge, abilities, maturity and his capacity for the professional sector in question. The test will also evaluate his technical experience in relation to the studies he wants to do.

The link between Modules

Due to the fact that Professional Modules exist at two different levels, the question has been raised of the possibilities of access to Level 3 Modules for students coming from Level 2 Modules.

One possibility is the access to a Level 3 Module coming from a Level 2 module by means a '*bridge course*'. This makes the vocational training system more flexible but has the problem that it has to be structured in a way that its contents are similar to those of the Baccalaureate, therefore creating parallel studies to it.

For this reason, it seems to be convenient that access conditions to Level 3 Professional Modules are only determined by Baccalaureate studies, except for workers, for whom the Access Test is designed.

In this situation, the student who has finished his Level 2 Professional Module studies, if he wishes to join a Level 3 Professional Module, must first complete Baccalaureate studies taking into consideration that he has no need to study again the subjects already studied for the Professional Module.

Implications for the training of teachers

The renewal in the curriculum of the future MIDDLE LEVEL VOCATIONAL TRAINING and UPPER LEVEL VOCATIONAL TRAINING implies the need to train the teachers that will teach it.

For this reason the Spanish Ministry of Education is developing a '**Knowledge Updating Plan**' for the teachers who in future will teach vocational training in the new educational system. It is intended that 7000 teachers will participate throughout 5 years.

But, apart from this project, the implementation of Professional Modules on an experimental basis has shown the need of the teachers participating in them of special training. The Ministry of Education has tried to solve this problem in two ways since 1991:

1. Long courses at enterprises

These have been developed by agreements between the Ministry of Education and entrepreneurial institutions with experienced teachers who are available to offer a quality training to teachers from Educational Centres.

These courses aim at the *technical updating* previously mentioned, specially in the real processes related to production. The training programmes last for 2 months approximately (with a minimum of 200 hours). In the first of these courses, around 150 teachers from sectors such as *Health, Electricity, Mechanics and Management* have been involved. The results of this first experience have been considered to be satisfactory, both by the Ministry of Education and by the teachers who took part in it.

2. Short courses (30-100 hours)

These courses are focused on the *updating in new techniques, capacities and knowledge* which are necessary for teaching the different subjects in the Professional Modules that are being developed on an experimental basis. Their contents aim to cover the **most urgent** updating demands.

In these courses, around 1000 teachers have participated for Professional Modules related to sectors such as *Management, Trade and Marketing, Electricity and Electronics, Mechanics, Health and Services*.

The attitudes and reactions to modular reform of different actors

We think that, since modular reforms started in Spain, it is still too early accurately to evaluate the attitudes and reactions of the different actors involved in modularisation.

Students seem to be getting on fine with them as they are courses with more specific training contents compared to traditional vocational training, which was longer and with more basic contents in its curriculum.

We cannot generalise from **teachers'** reactions to this new experience as their participation is voluntary. Evaluation of their reactions will be possible when the number of teachers involved is higher.

It is too early to know **employers'** attitudes in relation to young people who have been trained by this new system. The number of students who are now working is relatively low and there are still no studies in Spain of how these people are getting on at work.

Other important consequences and implications

Possibly, when implementation of modular reforms is at a more advanced stage, we will see changes in the structure and organisation of Educational Centres.

These changes are related to the need for a closer link with the production system. The following are some of the things which could be done:

- Organise the students' training at enterprises; this will mean the need of agreements with them.
- Hire 'experts' from the enterprises as teachers for certain Knowledge Areas of the Professional Modules.
- Establish agreements for the teachers to update their technical knowledge at enterprises.

3.4 CRITERIA OF EFFECTIVENESS

Probably the most effective method of evaluating modularisation as a vocational training system would be to establish a system to monitor the adaptation to work and the career development of the students who have received this type of education.

Spain has been experimenting with this model of modular education for a short time. We still lack relevant data which will enable us to value the effectiveness of this educational model.

We still do not know the opinion of entrepreneurs about the extent to which the training received by students involved in this type of education meets the qualification needs of the world of work.

The Ministry of Education intends to create the *Instituto Nacional de Calidad y Evaluación* (National Institute for Quality and Evaluation) which should be able to evaluate the quality of vocational studies in the future educational system.

3.5 ISSUES

In Spain, modular reforms imply:

1. A total *reorganisation and updating of the contents of the curriculum* so that they can meet new occupational qualification needs.

This includes the designing of a **Catalogue** containing approximately 300 degrees of Medium Level Vocational Training (*Level 2*) and Upper Level Vocational Training (*Level 3*).

2. A *plan for updating the technical knowledge of teachers* in charge of teaching this type of education.

These teachers will participate in long or short courses at enterprises with the necessary equipment to guarantee the technical updating of these teachers.

3. *A change in the structure and organisation of Educational Centres* because it is necessary to maintain a closer link with the production system. Students must receive part of their education at enterprises and teachers must also spend periods of time at enterprises to update their technical knowledge.

Chapter 4

FRANCE

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4.1 THE CFI CONTEXT

The object of our study is to analyse modularisation in vocational training, and more specifically in the CFI ('Individual Training Credit') system. The CFI, introduced in 1989, is a vocational training scheme for young people who leave school with no qualification. The aim is to help them to acquire a vocational training, at a level equivalent to the CAP (Certificate of professional capacity, a level V French degree), which can lead to entry to stable employment. The scheme was widened in 1990 to cover unemployed adults with no qualification. Therefore it is not, strictly speaking, an initial vocational education scheme.

Established in France in 1971, as the product of various influences, continuing vocational training was, at the time, considered as a means to promote equal opportunities, to articulate vocational training with employment problems, to get training 'out of school' and to increase the status of technical and vocational culture.

Since 1973 and the beginning of the economic crisis, vocational training has been used more and more as a solution to the instability of certain jobs, to the steady increase in unemployment and to the difficulties of young people's entry into employment. While these objectives already existed in the 1971 Act, they nevertheless induced a restructuring of vocational training and led to new measures, and particularly to various schemes to promote young people's entry to employment.

It is also from that date on that modularisation was applied to vocational training. A system with training periods of forty hours, based on objectives negotiated with the trainees, was piloted by the French Ministry of Education during the sixties in the Lorraine region, and concerned people facing economic redevelopment problems. This system was extended during the seventies and applied by a network of organisations, all related to the Ministry of Education (GRETA - Group of Continuing Vocational Training Establishments, CAFOC - Academic Center for Continuing Vocational Training), to provide various training opportunities for adults.

Since 1978, the Credit Units system (UC) has organized training in terms of coherent units, corresponding to units of assessment, in a hierarchical system which covers general and vocational fields. It offers preparation for a range of certificates, from the CAP to the BTS (Superior Technician Certificate - a level III degree), and including the BP (vocational certificate), in a large number of vocational branches. It is also applied to various vocational degrees in the agriculture sector (CAPA, BEPA, BPA), where it has been used in experiments in initial training.

At the same time, modularisation developed in different organisations for continuing vocational training, such as AFPA (Association for Adult Vocational Training, which comes under the Ministry of Labour, Employment and Vocational Training) in order to increase the responsiveness of the system to the diversity and evolution of training needs. Each module offers training periods based on skills and knowledge and is considered as a qualifying module. It can lead by combination or credit accumulation to vocational degrees (CFP - vocational training certificate; CPP - further training certificate, level V - IV - III degrees).

The CFI organization

The CFI is not a new training system. Its aim is to organize an individual training route for each trainee, based on existing measures such as the training programmes financed by the State and the employment agreements which include a training period and receive financial help from the State. The CFI is characterized by a territorial system and by an individual training route logic.

The territorial basis

The territorial basis finds its justification in the fact that the CFI caters for people with a low level of qualification and with little geographical mobility, and for whom it is necessary to offer locally available training and employment services (reception, information, orientation, training...).

Therefore, 400 training areas have been defined, to provide a local context for effective action. These areas are based as much on employment criteria as on the existing infrastructure for reception, orientation or training. Area co-ordinators have been engaged in each area, and new structures have been set up (Local Employment and Training Committees) which bring together the different partners involved in the scheme in order to organize, manage and coordinate their activities in each area.

The individual training routes

This aspect of the system is necessitated by the extreme diversity of people with a low level of qualification, and by their lack of clear occupational goals. Individual reception and guidance is therefore needed. Individual training routes are based on the application of five separate functions, which are found in each training area:

- ***a reception and information function***, the responsibility of a network of different reception organisations.
- ***a guidance function***, the responsibility of the 'correspondents' who work in these organisations and whose mission is to help young people to plan their training routes, and to follow their progress.
- ***an assessment function***: several assessment structures help the correspondents to clarify the occupational goals of the trainees and to plan their study paths.
- ***a training function***: various alternance training courses are provided by private or public training bodies. These bodies offer groups of modules in order to define or confirm occupational goals (called mobilization actions), or to acquire basic general or vocational knowledge in a family of occupations (pre-qualifying training), or to acquire a level V qualification (qualifying training).
- ***an assessment and certification function*** (in relation with the Attainments Validation Committees, located in each Department). Each trainee can have his acquired skills certificated as he progresses through his training. The training routes should therefore all lead to a level V certificate or to a qualification recognised by a professional branch.

The training paths can comprise combinations of different groups of modules, according to the trainee's initial level, his occupational goals and his capacities and skills. They can offer, if necessary, periods for competence assessment (to help the trainee in his orientation and in planning his training route); they can also offer in-company practice periods (with specific work agreements). Modularisation applied to this system (that is, of mobilization, pre-qualifying and

qualifying training) should allow individual training routes within each group of modules.

4.2 CHARACTERISTICS AND AIMS OF MODULARISATION

Even if traditional training courses are still widely dominant among the provision of training, modularisation is nevertheless developing, in order to improve the responsiveness of the training to the needs and expectations of the individuals or of the companies, and in any case, in order to fulfil the requirements of the CFI and, more generally, of public policy. But modularisation does not develop in the same way among all training bodies. The efforts of rationalization and the transformations that modularisation induces cannot be identical everywhere.

The concept of module

Initially conceived for qualifying training courses, modules are supposed to respect the existing skill levels and learning rhythm of each person. Modules divide the training into 'elementary segments'; only a combination of these segments allows the trainee to reach his final aim, by following his own personal progression path. Each segment or module is defined by its objectives, pre-requisite skills, content, and length, but also by the capacities to be developed more than by the knowledge to be acquired, in order to adapt to various occupational situations. Each module allows for assessment of the skills that have been acquired and can lead to a certificate corresponding to the level which is reached.

In the credit units (UC) system, modules can be obtained either by continuous assessment or by specific tests, and they are valid for five years. In addition to the different concepts of modularisation implied by the design and contents of individual modules, there are other important differences concerning the flexibility of training routes, according to the pedagogy - collective or individualized - which is applied.

In the case of a collective pedagogy, it seems that often the only choice in terms of objectives concerns the trainee's position in the hierarchical system of modules, and it is difficult to negotiate individual rhythms and learning paths. By contrast, if the module is disconnected from the learning group, it can be the basis of a pedagogy centred on the trainee, and allow negotiation of the objectives, learning rhythms, methods and periods of study.

Nevertheless, if individualized pedagogy (which relies on the management of training places more than of training groups, and is based on learning methods which put the trainee directly in relation with the learning object) is still weakly developed in schemes designed for people with a low level of qualification, pedagogical differentiation within each module (by the use of diverse learning methods or of work groups centred on different objectives) often allows for a certain flexibility in the process of learning.

Objectives or reasons for modularisation

For the financing bodies, modularisation is considered as a means:

- to improve the efficiency of the previous measures,
- to solve the increasing imbalance between the high demands placed upon continuing vocational training and the means available to it; in particular to allow people with a low level of qualification to register for a qualifying learning procedure and to encourage their participation by taking into account their existing skills,
- more generally, to give greater attention to individuals and to acknowledge their diversity.

That is why the CFI is considered as a way of promoting equal opportunities, of reducing social inequalities, or as a 'second chance' for young people leaving school with no vocational qualification.

It should provide for flexibility in training paths, in terms of objectives, training periods, learning rhythms and methods, even if these training paths must all lead to a level V degree and are to some extent constrained by a predefined combination of modules. The modules are also considered as an accompaniment for pedagogical changes, even if these changes are not explicitly required by official legislation.

In the case of this scheme, whose aim is to help young people's entry to the labour force through alternance training, the modules also appear as way to improve the articulation between training and working periods, by defining objectives related to the competences required at work, by defining a learning progression path and by allowing learning methods to be adapted to the constraints of production. Modules are also seen as a means to offer recognition of competences to the trainees after each period of training, in order to help them obtain a job at any time, or to resume further studies.

For the training bodies, who are conscious of the inadequacies of vocational training, modularisation is considered as a means to rationalize the educational process in order to reduce costs and to increase the quality of the training and the satisfaction of their various 'clients'.

Nevertheless, this rationalization works differently according to the training bodies; the level of flexibility as well as its formalisation differ according to their capacity to control the standards and criteria for training and assessment, particularly for the training that is already modularised, according to the relation they have with their environment (population concerned, fields of action, partnership strategies), according to their size (which determines their reception capacity), according to their system of values and according to the pedagogical methods which are used.

4.3 IMPLEMENTATION OF MODULARISATION

The consequences of modularisation, especially for the practices of the training bodies, vary according to the model of modularisation which is applied (individualized or collective and differentiated pedagogy). The consequences of modularisation for the organisation and management of training in each area vary less, because the provision of training is not homogeneous within most of the areas.

Organization of the supply of training

The main difficulties concern, on the one hand the organisation of a supply of training that is coherent with the economic context and the social demand, and on the other hand the organization of an integrated supply of training based on a quadruple coherence:

- **pedagogical**: coherence in the definition and application of the modules by different training bodies.
- **mechanical**: coherence in the distribution of training places across modules and groups of modules.
- **organical**: coherence in the articulation between the pre-requisite knowledge of a module or a group of modules, and the objectives of the previous modules.

- *chronological*: coherence in the timetable and in planning the dates when modules or groups of modules begin and end.

As previously mentioned, few areas have managed to harmonize their pre-requisite skills and objectives, their concepts of modules, and even less their pedagogical procedures. This quadruple coherence requires that the different partners agree on the terms which are used (pre-requisite skills, pedagogical objectives, modules, individualization...), that the different training bodies who participate at various levels are able to organize a real partnership, and that the expectations of the policy makers are always clearly expressed. What is more, the policy makers must be able to enforce these requirements.

Apart from the various internal logics of the training bodies, several elements are often seen:

- the weakness of pedagogy based on objectives;
- different concepts of modules, which raise questions, not only about the organization of knowledge, but also about the meaning and aims of the modules. For instance, mobilization or social integration modules have different aims from those of qualification modules;
- a lack of communication tools and even of technical or training techniques among the training bodies and trainers;
- difficulties in the management of trainees' movements; this management is important for the rational use of training provision, and depends on the capacity to plan training at the area level as well as for each training body.

Organization of training routes

The difficulties concern several points such as :

- *The negotiation of training routes* between the trainees and the correspondents. There are questions concerning the adequacy of information on local training and employment opportunities. In addition, the negotiation of study paths and of progression routes inside each group of modules is obstructed, on the one hand by the weak professionalization of the different partners in charge of this negotiation, and on the other by the system of constraints in which the negotiation takes place. The training opportunities in the area are not always coherent with the trainee's occupational goals; and even a modular training programme cannot always, for pedagogical as much as economic reasons, differ from a traditional training course.

The negotiation of study paths also raises the question of the trainees' capacity to express their expectations in a clear and realistic way. This question concerns more particularly the period which precedes qualifying training. The new PAQUE scheme (Active Programme for Qualification and Employment), which is being introduced and which precedes the CFI, should solve some of these problems. It provides new training opportunities focusing on the acquisition of basic knowledge, and on the elaboration of occupational goals. This training is more thorough (in terms of content, methods and length) than the mobilization training currently provided.

- *The organization and diversification of the study paths*. A certain linearity of the study paths sometimes appears. This is variously due to a very narrow organisation of the pre-qualifying periods, based on one occupation more than on a group of occupations, to a weak articulation between modules for social or cognitive learning and the qualifying modules, and to a still dominant collective pedagogy.

- ***The assessment and certification of the study paths***

The articulation between training and the assessment and certification of skills is an essential element of the scheme, which seeks to provide young people with certificates recognised in the labour market. Nevertheless it seems that, after 2 1/2 years, many aspects must be reconsidered. Examinations are still more frequent than continuous assessment, and the timetabling of training is still very rigid compared to the flexibility which is aimed for. Different approaches among the major validating bodies (Ministry of Education, Ministry of Agriculture, AFPA) restrict the harmonization of procedures and the broadening of assessment and certification. At the same time, several partners have expressed some doubts concerning the extent to which most of the certificates are appropriate either for the characteristics of the people concerned, or for the requirements of enterprises.

The practices of the training bodies

The restructuring of training, to allow for individualized progression among groups of modules, is based on a prior dialogue between the trainer and the trainee, on a certain deconstructing of the training group, on new relationships between the trainee and the object of learning, and on the organization of a system of guidance. Important differences nevertheless appear in the application of these elements, according to the training bodies and to their position in the training market.

Three types of training bodies exist:

- ***qualifying training organisations centred on employment more than on assessment and certification.*** Modularisation is here mainly theoretical than actual. The offer is based on alternance training more than on modularisation, which is seen as a means to differentiate objectives and methods if not learning rhythms.
- ***qualifying training organisations centred on assessment and certification.*** These innovating organisations differ from the previous group in that their training is generally modular. Even if their pedagogical approach can more often be defined as differentiated than as individualized, with no ongoing entry and exit points, nevertheless the existence of permanent organisations which regularly offer identical training modules, allows for a certain flexibility in the planning of study paths. Some of these organisations have even conducted experiments in individualized pedagogy (Resource Centres which belong to training bodies, or permanent centres of the Ministry of Education).

In that case, the restructuring of training is generally accompanied by a restructuring of the teaching team, with new posts of 'reception tutors' whose mission is to help young people define their training progression paths, of co-ordinators or pedagogic instructors, of guidance tutors and of partners in charge of relations with enterprises. Therefore the training profession itself covers new occupational specialisms which require proficiency in the use of specific tools, and the development of new competences, and call for the development of training courses for these different trainers.

- ***Organisations providing pre-qualifying training.*** According to their size, to the diversity of the population concerned, and the diversity of the schemes in which they participate, and more generally to the quality of the network in which they are partners, these organisations are more or less committed to the CFI procedure in following its specific requirements.

Some of these training bodies which often work in close relation with the reception organisations and which have a good knowledge of the trainees' characteristics have reconsidered their training provision, which had previously been something of a rag-bag, and defined new objectives and complementary modules, based on a wide range of pedagogical methods and on a partnership set up with different members of the social environment.

4.5 EVALUATION OF THE PROCEDURE

Out of the 150,000 young people who registered in the CFI between September 1989 and December 1990, more than 45,000, that is to say nearly one third, had obtained either a complete qualification, or the first phases of certification, by the end of 1991. Nevertheless, given the particular character of the CFI, it seems difficult to restrict the evaluation to the outcomes (number achieving total or partial certification, number entering employment). The study routes having no fixed length, it is not easy to decide when is the best moment to evaluate their effectiveness. Even if these outcomes could be measured, it seems more important to explain the variations between outcomes and objectives. Therefore, in order to analyse the quality of the scheme, it seems necessary to examine the articulation between functions, between modules (provided by each training body) and between groups of modules (inside each area), as well as the articulation of each function with its context (economic, social, institutional and training context). This analysis can be defined as a 'qualitative evaluation' which relates the quality of the scheme, and consequently its effectiveness, to its internal coherence, its external coherence, and the extent to which its means are appropriate for its aims and for the characteristics of its context.

Chapter 5

LUXEMBOURG

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5.1 CONTEXT AND FOCUS

The responsibility for pre-school, primary, secondary and higher education lies with the Ministry of Education. All sectors are covered by legislation drawn up by the Ministry. Management of the schools is shared by the government and local authorities and, in some cases, by private institutions. All pupils are required to sit public examinations in order to obtain recognised certificates.

Formal education in the Grand Duchy is compulsory from the age of five until the age of 15. At six the child enters the primary cycle, which in principle consists of six years. At the age of 12 the child passes into the secondary cycle and stays at least until the age of 15, the end of compulsory education. There are therefore nine years of compulsory primary and secondary education.

Secondary education is generally divided into two main branches, general secondary education and technical secondary education. A third category, the 'complementary classes', are available for pupils in the 12 to 15 age group, who have not managed to pass the entrance examination to the secondary cycle.

As in a number of Member States, recent reforms of the secondary cycle have occurred. The most recent concerning general secondary education was enacted on 22 June 1989. Technical education was reformed by the Law of 21 May 1979 and was recently revised by the Law of 4 September 1990.

In 1990-91 Luxembourg had approximately 22,000 pupils in secondary education, 18,930 in the public sector schools, some 2,100 in private Luxembourg schools, about 2,000 in alternative schools (international type schools) and between 1,400 and 4,000 were in schools in neighbouring countries, namely Belgium, France or Germany.

Of the total, 7,639 pupils were in the general education sector, 11,359 were in the technical sector, of which 2,188 were part-time.

Admission to general secondary education is by examination at 12 and if the cycle is completed, the pupil will sit the examination which awards the 'diplôme de fin d'étude secondaire', the Baccalaureate, which entitles the holder to enter tertiary education either in Luxembourg or abroad.

The main alternative to the general education stream is the technical stream, where again admission is by examination at the age of 12. There are some 14 technical high schools throughout the country serving approximately 12,000 pupils. Those not passing the examination are granted direct entry into the complementary cycle.

As with general education, the technical stream has a lower cycle comprising three years, classes 7, 8 and 9. The first year (class 7) is a general year with the curriculum covering the traditional subjects, languages, maths, natural sciences, human sciences, artistic, musical and physical education. In the 8th class (14-15 year old pupils) pupils are offered the choice of two streams, technical and vocational.

The 9th class offers further streaming and its conclusion marks the end of compulsory education. At this stage pupils may enter an apprenticeship and, subject to the favourable opinion of the class council, may enter a further stage of study.

Satisfactory completion of the 9th class work allows pupils to enter the intermediate classes. The young person enters specific initial vocational or technical training allowing him/her to obtain the CATP (Certificat d'aptitude technique et professionnelle), the 'Diplôme de Technicien' or the 'Diplôme de fin d'études secondaires techniques'.

In the structure of the general reform of secondary education a modification to the above formula is being introduced according to article 12 of the Law of 4.9.1990. Recognising that some pupils have more difficulty with the theoretical aspects of learning, a two-level programme is being introduced. The pupil will normally hold an apprenticeship and will in parallel follow the theoretical part of the programme at his/her own speed, using a series of modules which will permit a flexible learning programme.

This will last anything from two to four years and will lead to the award of the CITP (Certificat d'initiation technique et professionnel). It is hoped that once a pupil has achieved this intermediate stage he/she will go on to gain the CATP. It is in this sector that modularisation is to be introduced in the first instance.

5.2 THE CHARACTERISTICS AND OBJECTIVES OF MODULARISATION

The scope of reform

The sector of initial vocational training to use modular units is that forming the new CITP. The introduction of modules is experimental and will only be introduced in four or five training courses and will probably develop six to eight modular programmes. The introduction is planned for 1992-93.

Mention should also be made of a pilot scheme which is being carried out in the framework of the EC Petra programme for cooperation between large companies in the field of vocational training. The programme involves cooperation between the Ministries of Education in Luxembourg, France, Germany and Italy and five large companies, Arbed, Siemens, Electricité de France, Gaz de France and Olivetti.

This project has just concluded its first trial year. It concerns approximately 50 pupils in one technical high school in Luxembourg. All the pupils are working on modules in the electro-mechanics field and are working towards their CATP.

As well as the two projects mentioned above the Minister of Education has recently, 26 March 1992, announced the project 'Self', which is also destined to promote those qualities that are associated with modularisation, such as project work, working in groups and self assessment.

The reasons for modularisation

The linguistic factor

Luxembourg has a uniquely complex linguistic structure, which has a significant influence on the education system. Pupils are expected to master a minimum of three languages and children of foreign workers will have at least one more language, namely their mother tongue. Approximately 28 per cent of the school population is foreign and it is frequently these children who have the greatest difficulties in the school system.

Admission examinations for the secondary cycle depend on passing exams in both French and German. For some pupils, this has had a considerable impact on their academic achievement, and the failure rate in the admission examinations is much higher for the foreign pupils than for Luxembourg children. Solutions at both primary and secondary level are currently being explored including language streams and modular teaching for languages in the technical sector.

The industrial and commercial context

Luxembourg has an exceptionally high number of immigrants, who have over the years been integrated into the national economy. Immigration has always been a feature of the demographic structure of Luxembourg, but in recent years the trend has accelerated. In 1960 15.6 per cent of the active population was not Luxembourgish; by 1981 this figure had grown to 30 per cent and in 1991 approximately half of all salaried staff were foreigners.

In 1992 the resident active population is 160,000. In addition, Luxembourg calls upon the services of a further 34,000 trans-border workers, who thus comprise 20 per cent of the total labour force.

Unemployment is estimated by EUROSTAT (using the ILO definition) at 1.8 per cent; according to STATEC figures registered unemployed are 0.6 per cent of the work-force. Whichever figure is used, unemployment is minimal and the economy is drawing in many workers from neighbouring states.

Current demographic trends show that the ageing Luxembourgish population in work will not be fully replaced by native Luxembourgers in the near future. Luxembourg shares this phenomenon with many other EC member States - a low birth rate accompanied by increased life expectancy, which has serious implications on the future size and composition of the labour force.

The Luxembourg government has recognised that immigration will continue to be one possible answer, as in view of 1993 and beyond Luxembourg educators and employers realise that the present labour shortage in certain areas will continue. This situation has encouraged a re-examination of the school-industry interface, to see how the human resources of the country can be better harnessed and used to their full potential.

All parties acknowledged that educating the resident young to a high level was essential, if the country was to meet the growing demands for a highly skilled labour force.

All wished to see the school-industry interface improved. It was hoped that the introduction of modularisation would provide a more flexible approach, which would encourage young people to enter and continue with vocational training and meet the demands of industry.

The need for educational reform

Luxembourg has until recently been traditional in its approach to education; selection at 12, strict criteria for promotion and course-centred. This has produced good results for the most able, but has resulted in high failure rates, pupil demotivation and the associated drop outs for some of the weaker pupils. The problem is compounded for the foreign children who may be struggling linguistically as well. The relatively high level of scholastic failure combined with low birth rates and low unemployment, creating a labour shortage, have caused educators to reflect on possible improvements in the school system, which would make optimum use of the abilities of the Luxembourg young people.

Modularisation is seen as part of the new teaching methods and as a means of providing individual pupils with a tailor-made teaching package. It would in particular allow those pupils, who find the theoretical aspect of a course difficult, to work at their own pace rather than follow the current practice which is based on collective teaching and full scale examinations at the end of each academic year. Teachers would become trainers and become responsible for guiding rather than instructing their pupils.

The system of modular teaching units would bring greater flexibility to vocational training for both educators and employers. With the current speed of technological change, course work needed to be frequently updated and in the longer term all workers would need regular re-training, modular learning was seen as a means of achieving these objectives. Modular learning, would also bring 'learning through participation' combined with a greater degree of self reliance and motivation. Pupils would become active participants in the training process rather than mere passive receivers of information. Teachers would have to become coordinators rather than traditional school masters.

The concept of modularisation

Modularisation is seen as part of a new educational approach. It is defined as a learning unit which is self contained in terms of the content and which will be examined at the end of the study period, the length of which is variable. Depending on the subject modules may be taken in a flexible fashion or may require a sequential approach.

In the CITP programme, the scheme would in the first instance cover only four or five career options. There would probably be two or three from the CCM programme and two or three from the CATP, creating at most six to eight modules in the first two years.

In the Petra pilot scheme the concept of the module has been seen in a different context. Here the introduction of modules is related to the research programme directed at the development of core qualifications or skills. These are skills in part necessary for the specific activity namely in electro mechanics, but also in the broader sense developing transferable skills, such as the ability to analyse and take decisions. Thus there are both subject and learning elements in the modules used.

The modules currently being used have been taken from the Siemens programme, and they are based upon the approaches already developed by that company in its own training department. These modules are well structured and planned and have simply been transposed to the Luxembourg school.

The basic educational concepts which are developed are those which promote the transferable skills already mentioned. The objective of self regulated learning is achieved through a series of processes.

1. Information stage
2. Planning stage
3. Decision stage
4. Realisation stage
5. Evaluation stage
6. Final stage

In this form of teaching the pupils' work may be organised in one of three ways;

- individual self-directed work
- individual work prepared in a group, or
- work in group

In the early period of training the emphasis is on the individual self-directed work. As the pupils gain confidence they move onto the second stage preparing their work in groups and then executing the project themselves. The third and final stage is learning to work in a group; here the work is more complex and is divided into a number of sub-projects which have been planned by the whole group.

In this programme the trainer has the choice of methods open to him, broadly directed apprenticeship, the pupil remains largely passive or self-directed apprenticeship, requiring active participation by the pupil. Trainers are required to select the appropriate method according to the objectives set in the framework of the module.

The responsibility for the development of course design and assessment

The overall responsibility for the design of curricula, text books and course materials lies with the Commission nationale du programmes. While this body holds ultimate responsibility, it may call on schools and members of the educational establishment to help it in its tasks.

The developmental work for the CIP is scheduled for the early part of 1992, and will take place with the help of one or two pilot schools. The pilot Petra project will clearly provide valuable information, and the experience gained by the teachers involved will be exploited. In addition the Ministry will be looking to other countries, which already have well developed modular teaching programmes, for guidance.

The considerable work on the development and presentation of course material will involve the professional chambers, as they do by law have a direct role in the development of course content and their active participation is an important factor in the development phase.

All interested parties hoped that teachers might spend some time in industry so that they would more readily appreciate the needs of employers. The Ministry has already been working with industry to establish job profiles for certain sectors in the CATP and these could be a useful element for the development of the modular programme.

On assessment, there will be a move to an evaluation at the end of a module rather than at the end of an academic year or a final qualifying examination. The nature of evaluation in all contexts is being reviewed. Assessment should become part of the formative process and therefore corrective; it should encourage the pupil to self awareness and hence self-motivation. These qualities are seen as particularly relevant to the vocational sector and will accompany the introduction of a modular system.

Nevertheless the essential modalities of the existing system will remain the same. By the laws of 1929 and 1945 the professional chambers are required to participate in the examination process and this will continue.

5.3 THE PROBLEMS, CONSEQUENCES AND IMPLICATIONS OF MODULARISATION

At this early stage of implementation it is not possible to determine the real problems that the introduction of a broader modular system may pose, but in the context of the Petra pilot some practical difficulties have been encountered and these will be outlined below. In general terms, some of the partners have reservations about its application and these may be divided into two categories, those relating to recognition and value, and those relating to educational practice.

Recognition

Employers' representatives were generally more reticent about the introduction of modular

learning than the other participating parties. They were concerned that the qualification might be devalued, unless care was taken to ensure standards were maintained.

Certain industries and /or types of job were seen as less suitable for modularisation than others, particularly the highly skilled jobs and those in advanced technology or commerce. This led to the proposal that in the initial stages the most suitable candidates would come from the old CCM or selected subjects from the CATP.

Mention was also made of the need to extend the work being done on job profiles, so that the modules would correspond to the real skills required by industry.

Educational practice

While there was some reluctance on the part of the employers' representatives, education managers were generally much more positive about the introduction of modularised teaching, despite their recognition of certain difficulties which might arise in the short-term. On the positive side, modularisation would offer greater flexibility and offer pupils a tailor-made course responding to their personal needs and aptitudes, but there was concern about maintaining the balance between flexibility and viability.

The organisation of modular courses was not generally seen as a problem, for schools already dealt with complex timetabling for the current system of 'alternance' for example, and the extension for the scheme would not in their view be a major hurdle.

The move to modularisation will require from both Heads and teachers a new flexibility and understanding of individual pupils' needs and capacities. Careful guidance and counselling will have to accompany this so that pupils can build up a useful training profile.

The Ministry recognises the key role that will be played by Heads and the need for adequate in-service training of teachers, if the scheme is to succeed. Employers suggested that teachers should be encouraged to spend time in the work place observing directly the jobs they are preparing their pupils to fill. Bearing in mind that the project is directed to the less able and children with possible learning and social problems, it will be imperative to prepare teachers well.

The need for appropriate course material is certainly a priority. At the conclusion of the first stage of the Petra pilot the main practical difficulties cited by the teachers concerned was the lack of material. Schemes needing research required libraries with good, up-to-date reference material. This was rarely available.

Teachers had also found that it was difficult to cover the required course content in the time allocated. The more active role required of the pupil meant that the teacher or trainer was required to move at the pace of the pupil rather than the reverse.

The influence of the different partners

The tripartite vocational training partnership between employers, teachers and the Ministry of Education will not be amended.

Teachers will develop modules and adapt their teaching methods. The supervision of their work will lie with their Headmasters or Headmistresses. The Ministry will continue to give guidance and direction on overall policy, while employers will maintain their right to ensure that the examinations and final qualifications meet the needs of the professions and the labour market.

Nevertheless, all partners voiced concerns about the general coherence between what is taught in the classroom and what is required on the job. Stress was laid on the need for improved communications between industry and school. Some felt that industry was at times ahead in its pedagogical approach, promoting concepts such as learning to learn, team work, self-motivation and self-evaluation. The Siemens example was good one. Nevertheless many companies were much smaller and did not dispose of the resources of the big multinationals. They were more dependent on the Ministry of Education developing the appropriate pedagogical approaches.

The influence of pupils was only reflected indirectly through their teachers and Headmasters. Parental opinion appears to be more difficult to gauge although their participation has recently been statutorily recognised.

Attitudes to modular reform

With its broad mandate to ensure the adequate education of all young people, the Education Ministry clearly sees the introduction of modularisation as a positive step towards improving the prospects of some of the less able pupils, promoting as it does a more personalised teaching environment.

The teaching establishment appears to be more divided in its opinion, but Heads were positive. While recognising that there might not be unbridled enthusiasm from all their staff, they were prepared to work to put the programme in action.

Some employers had reservations on possible quality decline, and a concern that existing standards might not be maintained.

Other consequences, implications and problems

As Luxembourg is only just embarking on its pilot scheme it was difficult for respondents to pinpoint potential difficulties in specific terms. At this stage much developmental work needs to be achieved, which will call upon the experience of educational systems and indeed that of large firms, which have already introduced a modular approach.

The practical need to develop appropriate teaching materials in the necessary languages was urgent. The training of teachers in the new methodology by such schemes as 'Projet prof' was going to be essential to the successful introduction of the modular approach.

The current reforms have proposed to offer tuition in either French or German. This will certainly ease the situation for some migrant children who have experienced learning difficulties because of the heavy linguistic demands of the Luxembourg system.

5.4. THE CRITERIA OF EFFECTIVENESS AND ISSUES ARISING

At this early stage in the programme the Ministry could only indicate in broad terms how the modular system, and in more general sense the new teaching methods, would be judged and this could only be done after the project had run for two or three years. In essence the success of the introduction of modularisation could be summed up in the change in staying-on rates for 16 to 18 year olds.

If Luxembourg could increase its staying-on rate by, say, 15 per cent, and ensure that those leaving had a useful vocational qualification, then the introduction of new teaching approaches including modularisation would be considered effective.

A second factor for judging modular reform would be the transfer of pupils from the lower level courses up to higher level ones. Any increase in the quality of qualifications of young people leaving school would be considered a very positive result by all interested parties.

The Luxembourg study has provoked a number of thoughts concerning modular learning, some general and some relating specifically to the Luxembourg situation. The themes maybe divided as follows:

- modules and different levels of achievement and for different courses
- the value of flexibility
- new learning methods
- modules as an appropriate tool for a heterogeneous population.

The use of modules for different levels of achievement and different courses

While currently undertaking significant educational reform, Luxembourg is confining the introduction of modular learning to its low achievers. Nevertheless other systems already use modular learning for the most able; many universities work on a system of credits as do certain distance learning institutions.

Does modular learning respond to different levels of achievement and does it permit the upward mobility of young people more easily than traditional methods? Can modules be used for different courses providing a saving for the system?

Flexibility

'Flexibility' is the catch word of the 1990s. Requests for flexibility in programmes and approaches are often mentioned. Do modular methods provide that flexibility? Do they allow the education system to respond more quickly to the rapidly changing needs of the labour force and will they encourage people to continue training throughout their working lives? Do these flexible modules guarantee the quality of training that more traditional approaches are believed to provide, or do they lead to fragmentation?

New learning methods

The modular system as part of the new learning methods lays stress on the autonomy of the student, self-assessment, self-motivation, an ability to adapt and to work in project/topic-centred themes. Are these goals achieved in a modular approach and is there a difference between young people in initial vocational training and those in further training?

Modules an appropriate tool for heterogeneous population.

With its unique population structure, Luxembourg highlights some of the difficulties encountered by an education system when it has an unusually high number of migrants in its population. No other member state can claim to have nearly 30 per cent of foreigners in its school population.

With the overall demographic trends in the EC - declining birth rates and ageing populations - training as many of our young people as possible to as high a level as is practicable is vital.

Falling birth rates combined with longer life expectancy will raise dependency ratios. While Luxembourg will probably continue its policy of welcoming migration, other Member States are

also confronted by similar trends and do not so far show quite the same readiness. The pressure of migration following the opening up of eastern Europe and the high levels of unemployment there will no doubt increase. Many observers believe the push-pull factor in east-west migration will continue for at least the next ten years. Schools all over the EC may then be confronted with the imperative of training many more young migrants than they currently do.

Can European modules be created which would facilitate the integration of these young people and in parallel allow young EC nationals the job mobility provided for by the 1993 single market? Finally can such modules receive EC recognition in the same way as other professional qualifications?

Chapter 6

THE NETHERLANDS

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6.1 CONTEXT AND FOCUS

In the Netherlands, full-time education is compulsory for the first ten years (six years of primary education and four years of secondary education). As for the eleventh year (roughly age 16 or 17) part-time education is compulsory for one or two days a week.

Dutch secondary education is exceedingly hierarchical in structure. At the end of primary schooling, pupils are allocated to junior secondary vocational education (LBO, duration four years), junior general secondary education (MAVO, duration four years), senior general secondary education (HAVO, duration five years) and pre-university education (VWO, duration six years). Selection and allocation are based chiefly on pupils' proven learning abilities in the abstract/theoretical subjects. The curriculum in the first year (sometimes two years), known as the transition class, differs as between AVO/VWO and LBO. The current policy followed by the government is to introduce a common curriculum within the first three years of junior secondary education.

The admission to vocational education and training occurs after ten years of full-time education. LBO should be regarded as a preparatory branch of vocational education at junior stage which is a combination of general and pre-vocational education. The implications of introducing comprehensive education for LBO are not clear yet.

Vocational education at senior level falls chiefly within three different categories of provision: senior secondary vocational full-time education (MBO, consisting of long and short courses; the short courses were formerly called KMBO); day-release courses (BBO)/apprenticeship system and higher full-time vocational education (HBO).

The Dutch education system is divided into public and private education. However, both public and private schools are financed by the State. Public schools are set up and maintained by the State or by municipal authorities, private schools by artificial persons in private law such as foundations and associations. Virtually all public schools (especially those providing vocational education) are run by the municipal authorities. Private schools can be divided into denominational and non-denominational. Of the Dutch education system as a whole, some 2/3 currently falls into the category of private education. The distinction between public and private education is embedded in the Constitution and elaborated in various educational statutes.

The consequence of this so called 'freedom of education' (for private schools) which is embedded in the Constitution and the high proportion of private schools is the lack of a national curriculum. Government (eg. the Ministry of Education and Science) just monitors the quality of teaching and controls the 'outcomes'. Despite this 'freedom of education', the curriculum and teaching methods at the different schools are in many respects very similar.

This study focuses on modularisation within senior secondary vocational education which students enter at the age of fifteen or sixteen (after completing ten years of full-time education): MBO (short and long courses) and BBO/apprenticeship system.

6.2 CHARACTERISTICS AND OBJECTIVES OF MODULARISATION

The scope of reform

In the Netherlands, the date of introducing modularisation and the degree of implementation varies across the different types and branches of vocational education and training.

In August 1991, the KMBO-courses (the short MBO-courses covering two school years) were (formally) integrated with the long full-time courses into institutions for vocational education and training (the first step towards 'regional education and training colleges'). These short courses had started in 1979 as pilot projects. They were considered necessary because the admission requirements for long full-time courses and for courses provided within the apprenticeship system were too severe. The programmes of all these (eighteen) vocational courses provided within the pilot projects were designed in a manner that would now be called 'modularised'. The curriculum was divided into programme units (modules) related to relevant and realistic units of occupational practice. The pilot projects experimented with this type of vocational course (and modularisation) for eight years until 1987.

As for the apprenticeship system, the situation is much more complex. In 1992, there are 31 so called branch-specific national bodies (run by social partners and representatives of the educational world). These bodies are responsible for and provide apprenticeship courses within a specific branch. Some of them provide a large number of courses, others provide rather few, depending on the share of the specific branch in the national economy. The off-the-job part of the apprenticeship training is provided by regional BBO-colleges which are not branch-specific. The extent and rate of introducing modules has varied across the branches. Most of the national bodies started modularising their training system around 1985. In most of the cases, they started by introducing pilot projects. Approximately half of the national bodies (including the largest ones) can presently provide a revised branch-specific system of modular training courses within their apprenticeship system.

Within senior secondary full-time vocational education (the long MBO-courses), only some courses have been modularised; there are only scattered experiments on modularisation.

Reasons and objectives of modularisation

Modularisation has its roots in a number of developments; there are both school-based, curriculum-oriented reasons and industry-oriented reasons for modularisation. Important reasons for modularisation within vocational education and training can be located around 1980, when an economic recession started to develop. The problems concerning vocational education and training were formulated as follows: inadequate transition from school to work; high level of youth unemployment; shortage of well qualified professionals; a diversified, fragmented, not client-oriented and rather obsolete vocational education and training system.

The reason why the curriculum of the short full-time courses (KMBO) was modularised has to do with the origin of the courses. The short full-time courses were developed to fill a gap in the (vocational) education system, especially with regard to dropouts (or disadvantaged) in the 16 to 18 age group. The aim of these short courses was to offer students who, for some reason, did not fit into the more formal educational system, a basis of professional competence. The objectives of structuring the contents into clear and 'realistic' units were, on the one hand, to make individual routes possible and, on the other hand, to offer a meaningful programme.

With respect to the BBO/apprenticeship system, in the early 1980s it was stated that the courses within the apprenticeship system had become somewhat obsolete (did not meet the changed requirements for professional competence) and inefficient (too many youngsters dropped out). According to leading employers, industrialists and the government, the links between

education and industry were severely disturbed. Flexibility is an important aim as far as the modularised apprenticeship based courses are concerned. Additionally, objectives mentioned in the case of KMBO apply here too.

Modularisation as such is no major policy of the government. Its two main concerns are: re-structuring the vocational training system in a coherent and flexible system for vocational education and training for youngsters and adults, employed and unemployed; secondly making courses more relevant and responsive to (changes within) occupational practice. Modularisation is regarded as just one of the means to reach these goals.

The current policy, however, focuses mainly on the creation of different forms of dual learning courses: MBO-colleges (in the future 'regional education and training centres') and enterprises will be stimulated to create courses which consist of combinations of on-the-job and off-the-job learning. Those 'dual' courses are considered to be an important instrument to create a flexible vocational training system which should respond to the specific needs of students/clients and the (ever) changing needs of industry. Also, the transformation of the full-time courses into 'dual' courses is considered as very important with regard to the integration between BBO and K/MBO and other part-time courses.

Concept and characteristics

Modularisation, as implemented in the Netherlands, primarily focuses on re-arranging the content of courses. It has historical roots going back to the time when people were striving for equal opportunities in education. One of the activities within this movement was that of reforming the curriculum by 'thematically' re-arranging the content of teaching. By 'thematic' is understood that the content (of courses) should not be divided into artificial units that do not exist as such in reality (as is the case with the traditional subjects) because it is not the way children/students/people experience reality. Rather than division into artificial units, the content of teaching should be divided into meaningful units which should have a clear relation with (themes of) real life.

As far as vocational education and training is concerned, the pilot projects on KMBO are the best example of this curricular innovation. Within these full-time courses, (a watered-down version of) the concept of 'learning by participation' was implemented. This concept implies a kind of education or training which consists of providing or creating guided experiences in practical and realistic settings which have to be transformed into (new) learning experiences. Implementation of this concept of 'learning by participation' within full-time courses (instead of part-time - non-formal - education as was the intention) implied adjusting the concept to educational and 'didactic' principles, stressing its curricular implications (ie stressing the 'thematic organizing of content') and developing new teaching methods.

The modularised apprenticeship based courses also bear the signs of this - transformed - curricular concept of 'learning by participation'. Even considering some of the experiments within MBO we can see this. In the course of time, however, a change of concept has gradually emerged, which is best expressed by replacing the phrase 'thematic organizing of content' by modularisation (which seems to stress flexibility and efficiency instead of quality of teaching).

Characteristics of a programme unit (or module) within KMBO can be described as:

- a thematic collection of learning objectives concerning actions and activities that exist in actual occupational practice
- specification of the learning objectives in job specific goals and social-normative and communicative goals such as attention to labour and power constellations, cooperative working, formulating opinions and so on

- learning activities that consist of theoretical learning, experimenting with practical skills, application of theory and practical skills at work experience places and reflecting on as well as assimilating these work experiences
- (possibilities for) individual learning routes
- assessment of learning outcomes (process and product) and certification

The length of the programme units varies within and across KMBO-courses

Most of the modularised courses within apprenticeship training resemble the short full-time courses. Each module consists of (integrated) learning off-the-job (at school) and learning on-the-job (at the workplace). An important similarity between the short full-time and the apprenticeship-based courses is that much attention has been paid to designing clusters of modules (ie complete courses). Especially in the case of the apprenticeship system this is a major feature. Every complete course or cluster of modules is accredited by the social partners (organized in the 31 branch-specific national bodies) and the Ministry of Education and Science. Single modules have no value in terms of agreed national standards of competence for a specific job. Naturally, single modules have a certain value for individual employers and employees, for instance with regard to updating knowledge or improving performance in relation to changed operating procedures and methods.

Design and development of modules: roles and responsibilities

As for the responsibilities concerning modularisation, there are major differences between the various types of vocational education involved.

In 1979, when the pilot projects on the short full-time courses within senior secondary vocational education started, no curriculum or teaching methods were available. Projects started with self made provisional programmes. At the same time, a broad framework for developing the courses and especially the programme units was set up, combining national and local initiatives (design, experiment, evaluation and implementation had to be a continuous process). This massive operation of developing curriculum documents and programme units was a totally education-based development. No organizations of employers or employees were systematically involved.

In the case of the apprenticeship system, the branch-specific national bodies are the central actors. In principle, the national bodies are responsible for the quality and assessment in respect to the on-the-job part. Also they are responsible for developing the curriculum documents (outline and attainment targets) for the courses (these must have the approval of the Ministry of Education and Science). BBO-schools are responsible for the off-the-job part.

In modularising the apprenticeship based courses, the national bodies have broadened their influence. They coordinate the total process and they plan and set out the activities. They are also responsible for the development of the modules including the assessment instruments. Each national body has (created) a department for curricular development in which educational specialists and branch-specific professionals, with expertise in the relevant occupational practice, work together. These departments have actually developed the modules or rather coordinated their development (in most cases, groups of teachers and supervisors were involved).

With respect to the long (and short) full-time courses within senior secondary vocational education (MBO) a new structure of responsibility for (the quality of) courses and curriculum reform has recently been developed. This process started in the mid 1980s when a reform of the MBO (including integration of long and short MBO courses) was thought necessary. In 1987, national branch consultative bodies for full-time vocational education were set up.

For the K/MBO especially, the involvement of industry and of the social partners is a new aspect. Also new for the K/MBO is the fact that the national bodies are not organized according to the main distinction within the MBO (four main sectors) but according to occupational branch.

Now, in 1992, there are 19 such bodies which consist of a well-balanced representation of all the institutions involved in vocational education: social partners, unions of teachers (segregated by denomination) and organizations of school boards (also segregated by denomination).

The procedure is that the social partners deliver the job profiles and the national consultative bodies translate these into course profiles and attainment targets (which have to get the approval of the Ministry of Education and Science).

The process of implementing the revised education or course profiles (curriculum documents) will start after the summer of 1992. At that stage, modularisation might become one of the instruments used to translate the course profiles into a curriculum.

6.3 PROBLEMS, CONSEQUENCES AND IMPLICATIONS OF MODULARISATION

Access and progression

During the eighties, both KMBO and apprenticeship based courses were responsible for widening access to vocational training. However, this is not entirely due to modularisation; designing modularised 'orienting and bridging courses' is a more important factor in this.

As far as progression within vocational training is concerned, assessment and certification are major problems. This is not accomplished yet. It is important to notice that every actor involved in vocational education and training agrees upon students completing at least a certain number of modules which offer them a minimum, nationally recognized standard of competencies. This minimum standard of competencies should enable students to practise a job independently. Modularisation seems to have improved the number of students who complete this minimum qualification (although no exact figures are known).

The planning of training programmes

One of the major problems is the tension between flexibility (flexibility of choice, flexible progression and flexible adjustment to changing occupational practice) and quality aspects of the modularised courses (quality of learning and teaching; quality of learning goals for the training programme as a whole; quality of future prospects offered to students by the training programme).

In the Netherlands, these aspects of tension between flexibility and quality are considered to be important issues and problems that have to be dealt with in relation to modularisation.

Courses within KMBO, as well as within the apprenticeship system, are not as flexible as firstly intended. Modularisation, in general, turned out to be an innovation within courses. To some extent, modules even got a fixed place in a course due to 'didactic' reasons and because of efforts to avoid 'fragmentation' of courses or learning processes.

An important characteristic of a training course is the fact that it provides a specific route towards a specific ultimate goal (a particular profile of competencies). It involves a learning process which calls for the structuring of teaching methods. Learning processes and their educational design have a logic of their own. This can result in the need to make different choices in defining and delineating units (ie modules). A direct translation of clusters of activities

of practitioners in a field of work into teaching modules is thus neither possible nor desirable.

In recent SCO-research a number of criteria and considerations were formulated for the process of designing modularised courses. The first question that deserves an answer is: What should the profile of competencies achieved by students at the completion of a course or a certain cluster of modules be? Furthermore, four types of considerations should be taken into account: 1. educational psychological considerations (focusing on the characteristics of learning processes); 2. (occupational) logical considerations (focusing on the characteristics and rhythm of occupational practice); 3. considerations related to teaching methods and strategies (focusing on the selection of content and the planning of the learning process throughout the modules); 4. emancipatory considerations (meaning that a training course is more than just a preparation for a job).

Pedagogy and the role of teachers

Teaching materials for a programme unit or module consist of study programmes and exercises for school and workplace. Each module starts with planning a 'learning path' that has to be designed by trainers and students 'in negotiation'. Teachers (on different subjects) and trainers have to work together to realize this planning. Students have their own responsibility to work and learn according to this planned learning route.

This cooperative planning and organizing of the (individual) learning process causes lots of difficulties. On the one hand, students and trainers are not used to it; on the other hand, the rhythm of school based learning and workplace based learning is different and it is not always possible to match the two.

Teaching and guiding modularised courses appear to be placing fresh demands upon the teachers and practical trainers involved.

As far as teachers are concerned, changes are taking place in four areas: the organization of the learning process; supervision of students (focusing on individual student guidance and counselling); support of the content (teachers must continually keep their knowledge up to date about all aspects and all parts of the entire programme); broadening individuals' experience (for example by project teaching, cooperative learning).

The increase in workload for practical instructors is concentrated in four areas: bearing responsibility for the planning and organization of the learning process in the workplace; giving shape to the relationship between theory and practice; broadening individuals' experience (expanding, updating and so on); evaluation and assessment.

The influence of different actors on modular programmes

With respect to the content of courses within the Dutch education system the influence of the national authorities (eg. the Ministry of Education and Science) is limited, because of the so-called 'freedom of education'. No curricular innovation which affects the teaching methods and the organization and planning of the learning process can be imposed by the Ministry. The Ministry is only able to stimulate certain curricular innovations, put a little pressure behind them and create pre-conditions or set good examples, for instance by using the education support structure.

Concerning KMBO, the influence of the educational world on content and standards of the modularised courses was dominant. As regards modularised apprenticeship based courses, the influence of social partners and the educational world is rather balanced (although organizations of employers manage to have greater influence than organizations of employees). This rather balanced influence will be the same with the new MBO.

The method used to modularise the courses is very influential on the content and standards of modularised courses. This method starts with an extensive study of the activities of practitioners in the field carrying out the job which students are being trained to perform, resulting in job profiles. It is important to note that these job profiles are based upon a breakdown of the activities performed by people working in the field. Clusters of activities are distinguished in the job profile. These are the units from the occupational practice to which the training programme is supposed to refer. The connecting link in the job profile (between the clusters of activities) is the fact that a particular functionary performs all these activities.

A problem is the fact that putting together these clusters of activities does not in itself yield a definition of the content of the whole thus produced (this also applies provisionally to the modularisation of training courses). In some respects, the profile in question is a task profile rather than a job profile (profile of necessary competencies): it is concerned with 'what' a person does rather than with 'how' s/he does it. This question of 'how' in fact characterizes the fully-trained professional, or 'expert'. The risk of this method used as a starting point for modularisation is that this type of competence (which is less 'visible') will disappear 'amongst the modules' because the method only focuses on the 'visible' activities (eg. tasks) of practitioners/professionals.

This method prevails currently. It has been used for apprenticeship-based courses, although national bodies used and 'translated' the outcomes of this kind of research of occupational practice to different extents. Many national advisory bodies for MBO (for revising the long and short full-time courses within MBO) have also used it.

Attitudes and reactions to the modular reforms

As far as teachers are concerned, significant changes are taking place in their role because of modularisation. However, their opinions regarding these changes differ: some teachers complain about the devaluation of their competence, while other teachers say that they primarily see a new challenge in the different approach which they have to use.

Trainers, practical instructors, in general, affirm that the modular system offers them more structure and support in guiding and training their students/apprentices. At the same time, practical instructors find it more difficult to train students within the modular system. Practical instructors clearly express the need for more support and training with respect to their work of guiding and training students within the modular system (for example on assessment procedures, individual guiding, pedagogical competence).

Students seem to have major difficulties with the independence that modular courses ask from them. They have problems with planning and organizing their own learning process. They also report that the on-the-job and off-the-job parts of the course (ie of a module) are not sufficiently integrated yet and that these parts are handled (trained and assessed) too independently of each other.

Implementation strategy

In the Netherlands, an implementation strategy for implementing modularisation within vocational education and training is non-existent. However, in 1988, the Ministry of Education and Science produced a policy paper on modularisation. It stated that modularisation had to be implemented in all types of senior secondary education (both general education and vocational education and training). Despite this policy paper, the current situation is that in general education (HAVO/VWO) as in MBO, only scattered experiments on modularisation have been carried out. Because modularisation has to do with organizing and planning the learning process and with teaching methods, the Ministry cannot force this innovation. It is up to the schools or colleges to decide whether they want to modularise their courses or not.

The consequences of this lack of pressure coming from the Ministry (either because they are unable to do so or because no priority is given to modularisation) can be felt within MBO as well as within the apprenticeship system/BBO. BBO-teachers have been offered less support than they ought to receive. Concerning the (new) MBO, support on implementing the new outlines and attainment targets of courses, for example by modularising the courses, is lacking.

6.4 THEMES AND ISSUES ARISING FROM THE COUNTRY STUDY

Key issues arising from this study on modularisation in the Netherlands are related to defining criteria of effectiveness of modularisation and, secondly, to aspects concerning development, design and quality of modular courses and systems.

Primarily, criteria of effectiveness of modularisation should focus on its initial goals. Presently, with the coming reforms within senior secondary vocational education (MBO and BBO) we might add another goal: Modularisation as an instrument for developing a coherent and flexible system of vocational education and training. Therefore, to evaluate the effectiveness of modularisation, a distinction between 'internal' and 'external' results has to be made.

Criteria of the 'internal results' might be: 1. widening access: offering a vocational training course to a varied client group, which leads to - at least - minimum competencies for practising a profession and which are, at national level, recognized by social partners; 2. improvement of the success-rate: increasing the number of clients/students who successfully complete a cluster of modules (ie a modularised course), whose standards are nationally recognized by social partners; 3. improvement of progression within modules and modularised vocational training courses (ie lines of study).

Criteria of the 'external results' might be: 1. improvement in the number of clients/students who find a job or enter further (vocational) education and training; 2. improvement of the students' or clients' capacity for learning and of their capacity for adaption to changing or new situations (mobility within and across jobs; career development).

As far as the Netherlands is concerned, the evaluation of effectiveness should also focus on the results with respect to the implementation of modularisation (ie of its goals); for instance regarding the quality of the outline and goals of modularised courses; the quality of teaching and counselling; type of assessment procedures; support for teachers and trainers and the possibilities for transition.

Other themes that might be of interest to explore and which relate to the development and design of modular systems are for example:

1. The extent to which modularisation can be an instrument in creating a flexible and coherent system of vocational education and training that meet national standards of competence. In deepening this issue, the tension between flexibility and quality as has been mentioned in section 6.3 ('the planning of training programmes') might be of interest.
2. The quality of the (design of) modularised courses (ie lines of study, clusters of modules). It would be most interesting to compare modularised courses (lines of study, clusters of modules) in different countries with respect to similar criteria and considerations as has been mentioned in section 6.3 ('the planning of training programmes'). This implicates a study of (a number of) modularised courses (lines of study, clusters of modules) on formulated learning outcomes (competencies) for a course/cluster as a whole, the way these courses/clusters have been 'split up' into modules (or gathered together) and - possibly - the advocated sequence of taking up modules.

Chapter 7

SCOTLAND

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7.1 CONTEXT AND FOCUS

In Scotland full-time education is compulsory up to age 16; most is provided in public, comprehensive schools. At 16, young people may: continue at school for either one or two years; enter a full-time course at a further education college; enter Youth Training (a two year programme of integrated work experience and training); find a job or an apprenticeship; or become unemployed.

The curriculum in schools is pre-dominantly academic but there is considerable overlap between the academic and vocational curricula. The traditional academic qualification is the subject-based Higher grade but many students also take other qualifications including vocational National Certificate modules. Most courses in further education colleges provide vocational and occupationally specific training for semi-skilled, craft and technician level jobs. Attendance can be full-time or part-time. Certification is mainly through National Certificate modules.

The Scottish Office Education Department (SOED) controls the system but local education authorities have considerable scope to determine organisational and curricula matters. The SOED shares responsibility with the Department of Employment of the UK government for vocational education and training.

The predominant concern of the British government over the last decade has been to raise the qualification and skill levels of 16-18 year olds by encouraging greater participation in education and training. Although participation has risen over the past decade, rates are still below government targets. In addition, the quality of some part-time training is questionable and participation at the 18 and 19 year old stage is particularly low in comparison with other industrialised countries.

The study focuses on non-advanced vocational education and training in Scotland; this was modularised in 1984 with the introduction of the National Certificate.

7.2 CHARACTERISTICS AND OBJECTIVES OF MODULARISATION

The scope of reform

Over the period 1983-85, all existing non-advanced vocational courses for post-compulsory students were reformed. The reforms moved the curriculum away from knowledge-based courses determined by nationally set syllabuses to a system of modules based on statements of competences. Teaching and assessment methods were also changed. There are now 3,000 modules covering all occupational areas. Although modules are essentially vocational in nature, there are also general modules and they can be taken in schools by students following a mainly general education as well as by students in further education. Modules are accredited through the National Certificate (NC); the system is the responsibility of the Scottish Vocational Education Council (Scotvec).

Modules can be taken by young people in school or on full-time courses in further education, but also on a part-time basis by those in a job, on a government training scheme or who are unemployed. The NC provides a single, cohesive national framework for this diverse

client group, offering a common basis for curricular planning and for integration and progression.

Initial vocational education is concentrated at the 16-18 stage in Scotland; in 1989/90 approximately 44% of all 16-18 year olds were registered for the NC.

Reasons, aims and objectives of modularisation

The NC was introduced because of low participation rates, a lack of suitable non-academic courses in the upper stages of secondary school and of certificated provision for young people on Youth Training, and a confusing range of outdated and inflexible courses in further education colleges.

Aims and objectives included: more choice for individuals; increased participation through easier access and progression and because of improved motivation through the new teaching and assessment methods; higher skills levels among the workforce; a system more responsive to industry's needs; rationalisation of provision; the extension of national certification to more students; the encouragement of more student-centred approaches to learning; and assessment to prescribed national standards.

The NC is part of the debate since the mid 70s about the need to reform education and training to improve Britain's economic performance. Central themes in this debate are: the need to design training on the basis of nationally agreed standards of competence; the concept of 'core skills' common in a wide range of tasks and central to skill transfer; the desirability of a flexible modular form of delivery to improve participation and bring in new groups of students.

Definition and main characteristics of modularisation

NC modules are self-sufficient units of study that have a notional duration of 40 hours. Each module is defined in a 'module descriptor'. The learning outcomes which specify what is to be learned, assessed and certificated are the most important parts. Learning outcomes cover three areas: knowledge and its uses; key skills; and behaviour. The descriptor also includes performance criteria and recommends assessment procedures. Assessment is criterion-referenced, internally set and carried out on a continuous basis; modules are not graded. Participative, student-centred teaching and learning methods are suggested.

Single modules can be taken as free-standing units or combined in different ways to meet individual needs. In many cases students' programmes are largely determined by national agreements with employers groups but students in school can choose a few modules simply for interest. A National Certificate is awarded for even one module. Until 1990 Scotvec did not accredit a group of modules. Since then group awards of certain combinations of modules can be accredited. The most significant category of group awards are Scottish Vocational Qualifications (SVQs): nationally recognised qualifications for a particular occupational sector, made up of NC modules and other types of units. The move away from individual awards has continued with the development of General Scottish Vocational Qualifications (GSVQs). GSVQs, based mainly on NC modules, provide a broad foundation in a vocational area, and will be offered on a full-time basis in schools and colleges from September 1992. The introduction of SVQs and GSVQs is likely to have an impact on the design of students' programmes.

National standards are achieved through the learning outcomes specified for each module and through a process of validation and moderation carried out by Scotvec. This process is currently being changed to give institutions more responsibility for the standard of their provision.

Design and development of modules: roles and responsibilities

Scotvec's Sector Boards, which include representatives from industry, commerce and education,

are the executive level for decisions about the curriculum; they work through Development Groups which manage Writing Groups which produce new or revised modules. Each Writing Group includes staff from college and/or school, a Scotvec officer and, depending on the module area, a representative from industry. Initially difficulties were found in expressing learning outcomes in competence terms but with training and experience Writing Groups have become more expert in how to write modules. Provision is regularly reviewed (300 modules each year); centres offering modules can submit comments to Scotvec which also actively seeks reaction.

With the introduction of SVQs, industry now has the responsibility for setting standards of competence so that where NC modules are being re-written to meet SVQ requirements, Scotvec must base their revision on these standards. Although industry has been involved in the development of NC modules from the outset, until the introduction of SVQs the process had been education-led.

The module descriptor is only a skeleton; the centres offering modules must develop learning, teaching and assessment materials. This might be done by individual lecturers or teachers or on a group basis within colleges, by education authorities, or by national agencies.

Local authority colleges and school are responsible for the bulk of NC provision. The extent of workplace delivery of NC has been limited but is likely to grow because of SVQs which stress assessment in workplace conditions. Initially the provision of modules in school was expected to be limited but it has grown dramatically (in 1989, school students made up 40% of NC candidates). Although the NC has enriched the school curriculum and weakened academic and vocational boundaries, there are problems about the low status of modules in school and the poor success rate of certain students.

Other relevant features: the Scottish context

It has been argued that a desire to preserve Scotland's separate education and training system was one of the implicit objectives of the introduction of the NC. The more centralised nature of the Scottish system also meant the NC could be implemented rapidly. But Scotland has not been immune from developments in England and Wales. The introduction of SVQs has largely been brought about by the need to keep in line with developments in England and Wales.

7.3 PROBLEMS, CONSEQUENCES AND IMPLICATIONS OF MODULARISATION

Access and progression

The wide variety of students taking NC modules indicates some success in improving access. But access is limited by *external* factors such as employers' willingness to train their young workers.

It is possible to move within the NC system while changing statuses. In CES research we found that in 1989 more than a third of 19 year olds who had taken modules had studied modules in more than one status. We identified four main progression routes: school and full-time further education; school and Youth Training; school and employment; and Youth Training and employment. Our research revealed a high level of curriculum continuity between school and post-school modules. However we also found that a high proportion of students duplicated modules taken at school in a later status. The need both to structure modular provision in school and establish clearer routes of progression has been recognised and several projects are tackling this issue. We found a sharp fall off in participation and hence progression in the NC after the age of 18 especially among young women. It is at the 18-19 stage, rather than the 16-17 stage, that British participation rates are lowest by international standards but in Britain, priority in training matters is given to 16 and 17 year olds. A flexible and open modular system alone is not enough to overcome the social, economic and labour-market factors that control access to, and

progression within, vocational education and training. The institutional context needs to be changed if modularisation is to realise its potential.

In our research we also examined progression *outwith* the NC system. We found major differences in the destinations of NC students depending on the status in which they had taken their modules and the subjects they had studied. In general there was a reasonably strong match between subjects students had studied and their occupation or industry of employment. The reluctance of higher education and especially the universities to recognise NC modules has been a continuing problem although recently they have taken a more positive approach. NC students who did go on to higher education were most likely to go into full-time non-degree courses and few entered university. Scotvec has almost finished modularising its advanced courses which will enable smoother progression from the NC into this sector of higher education.

The planning of training programmes

Flexibility and choice for both students and employers are key concepts in the NC although it is questionable whether these aims are compatible. Flexibility and choice for students depend partly on the availability of guidance. The NC has led to more systematic guidance provision in further education; most students now receive some guidance although the extent and quality varies across colleges. Schools already had a well-established guidance system before the NC and students' choices are not determined by employers' requirements although they are more likely to be restricted by the limited range of modules available in school and their secondary position in the school timetable. In further education, typically, 70-85% of modular programmes are fixed with the rest as elective elements. But students' choice of elective modules can vary from three to 100. A particular problem in modular programmes in further education is repetition of previous education and training, including repetition of NC modules already completed in school.

In general, the extent of choice and differentiated individual training programmes has been limited by institutional and organisational factors (timetabling problems, staff costs, etc); the demands of employers and industry bodies leading to the use of standard packages of modules; and the limited development of flexible learning systems. Although examples of flexible learning and innovative timetabling confirm the NC's potential for flexibility, the trend is moving away from student choice with the shift towards recognition of group awards of modules. The pressure from some industrial groups to devise mandatory sets of modules raises the question whether, in practice, flexibility is really valued by most employers.

The issue of 'whole programme' design is a continuing difficulty; some of the benefits of the NC relate to the availability of modules as free-standing units but the division of the curriculum into modules may lead to the fragmentation of learning. An SOED evaluation of the NC found that too often the module rather than the programme was the major focus of attention. The delivery of core skills was particularly affected by staff's focus on individual modules. They recommend the integrated delivery of modules.

Pedagogy and relations between students and teachers

The SOED evaluation concluded that in further education colleges there had been a major shift from traditional to more practical, activity-based learning approaches under the NC although they found variation across colleges and, in particular, differences depending on subject area. The greatest single negative influence on learning and teaching was the way staff interpreted assessment requirements. In some subjects the main approach was to teach and test each learning outcome discretely, leading to a fragmented learning experience. Nevertheless, the NC had led to the use of a broader range of assessment instruments and coverage of more aspects of student achievement than had the previous system.

The NC has changed professional practice in relation to the planning of teaching and especially in relation to assessment. Before the NC, examinations were set and assessed externally; now lecturers and teachers devise and carry out assessments.

Although the NC reforms implied the need for extensive staff development, it had to be implemented within existing resources. This has had a negative effect on staff development although colleges have generally adopted a more systematic approach since the introduction of the NC. The large uptake of modules in secondary schools has had little impact on initial training courses for teachers.

The influence of different actors on modular programmes

While the modular system may have allowed students more flexibility in their programmes, it has not increased their influence. The principal actors are still staff in colleges and schools and employers. Until recently industry exerted more influence on the construction of programmes than on individual modules. Such influence was not new. The NC has not itself radically changed the relative influence of education and industry on the vocational education and training. The recent changes result from deliberate government policy to give industry the central role in determining the content and standards of vocational training via SVQs.

Attitudes and reactions to the modular reforms

Research indicates that in general students have responded positively to the active student-centred learning of the NC and to its assessment procedures, although students in school were inclined to question the status and value of modules compared with the main academic certification. Market research for Scotvec found a low level of awareness among employers about the NC. Other research with employers who used the NC found that they were generally positive about it. They thought it had improved the relationship between theory and practice and provided better assessment of students; there was some demand for graded assessment.

Both students and employers were more positive about the NC than lecturers in colleges (there has been little research on the attitudes of school teachers). But there were differences in lecturers' attitudes depending on their subject area, and also between staff in different colleges. It seems that staff's responses are determined as much by the managerial and training support they receive as by the modular reforms themselves. Some of the lecturers' criticisms of the NC were also misconceived, based on a misunderstanding of the system. In general staff welcomed the changes the NC had brought about in teaching and learning. Researchers found that lecturers accepted the principle of criterion-referenced assessment - a shift from earlier attitudes - and identified advantages to continuous assessment. Nevertheless, lecturers were critical of the NC assessment model because of excessive paperwork, the (perceived) negative effects on student learning and the lack of grading; they expressed concern about quality assurance and national standards. But under the NC, lecturers are much more directly involved in assessment and therefore more aware of its imperfections than under the previous system. They have also had insufficient training in this area. The SOED evaluation concluded that the low self-confidence of some staff about assessment was not well-founded.

Overall, while employers and students were more positive than lecturers, all three groups believed that the NC had resulted in a significant improvement on the system it replaced.

Other consequences, implications and problems

The NC has meant that institutions have needed to develop responsive student record-keeping systems to keep track of students' progress through their modular programmes. The NC has also led to the development of a computerised guidance information system for users.

7.4 CRITERIA OF EFFECTIVENESS

A starting point is the original aims and objectives of the modular reforms and the extent to which they have been achieved. These aims can be categorised on the basis of the extent to which their achievement is subject to external factors or within the control of the 'actors' in the NC system. The compatibility of the various aims should also be considered. Additional criteria that could be used include: equal opportunities; the impact on staff; and the impact on institutions.

7.5 KEY ISSUES

The NC has achieved considerable success and has generally been received positively by students, employers and, to a lesser extent, by staff in colleges. Nevertheless, there are a number of key issues that need to be addressed.

One issue is whether most employers value the potential of modular systems for constructing flexible training programmes; whether student choice is a realistic aim and the implications of the trend to specified groupings of modules.

Another issue concerns the decline in participation in the NC after the age of 18 after high levels at the 16-17 stage; the sharp gender differences in participation and progression; the poor NC achievements of young people with few formal qualifications; and the influence of external factors in limiting participation and progression.

While the extensive use of NC modules in schools is one of the NC's achievements, it also raises critical issues such as the relatively low status of modules in the school curriculum and the wider implications of this for the status of vocational education and training; the extent to which modules taken in school are recognised by colleges and the implications of this for the NC as a common currency across the different sectors of the education and training system.

The NC has resulted in major changes in pedagogy and assessment but staff in colleges are still concerned about assessment and national standards. Their concern is related to a lack of training and emphasises the importance of adequate staff development to the introduction of modular reforms. Staff also need to address issues of programme design; how to deliver modules in a more integrated way and to respond flexibly to students entering colleges with modules taken in school.

The likely impact of the introduction of SVQs with a consequent shift of influence from education to industry is another issue that faces the NC system.

CHAPTER 8

OVERVIEW: THEMES EMERGING FROM A COMPARISON OF THE SIX COUNTRIES

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8.1 INTRODUCTION

In this report we have described some aspects of modularisation in initial vocational education and training (VET) in six EC countries. This final chapter offers an overview of this experience, and identifies some themes which emerge from a comparison of the six countries. The structure of the chapter follows four main questions, addressed in sections 8.2 to 8.5 below: When and where have modules been introduced? What are the objectives of modular reforms? How are modules (and modular systems) defined and specified? And what practical and other issues are raised by the experience of modularisation?

8.2 WHEN AND WHERE HAVE MODULES BEEN INTRODUCED?

The six country studies describe the following modular reforms:

Germany : Within the dual system, modular concepts have been introduced in a few innovations by large companies or training schools (although they have not usually used the term 'module'); most other modular innovations are in continuing training, although some of these - notably in new technologies - are available to young people in initial training as well;

Spain : One-year vocational modules at EC levels 2 and 3 are planned for students leaving compulsory secondary education and baccalaureate study respectively, as part of a national reform of the education system to be implemented in the 1990s. Currently the modules are being piloted with 4500 students. A third set of modules is planned for students who experience difficulties within compulsory general education.

France : The Credit Formation Individualisé (CFI), a scheme introduced in 1989 primarily to enable unemployed unqualified young people to obtain French level 5 qualifications and stable employment, is organised on a modular basis. (In many cases it uses modules from two systems for adults: Unités Capitalisables and AFPA.) Apart from the CFI there has been limited modularisation in initial VET.

Luxembourg : Modules will be introduced in 1992 in the Certificat d'Initiation Technique et Professionnel (CITP), a new programme for young people whose social, linguistic or other disadvantages make it difficult for them to achieve EC level 2 qualifications through conventional routes.

Netherlands : The study focuses on senior-secondary VET: KMBO courses (modular short full-time courses introduced in 1979 for dropouts and other disadvantaged 16-18 year olds); MBO (long full-time) courses, recently integrated with KMBO, but whose own experience of modularisation has so far been limited; and apprenticeships, where a process of modularisation which started in the mid 1980s (in some cases, earlier) has now covered half the occupational fields, including the largest ones.

Scotland : Almost all non-advanced VET (below university degree level) has been modularised since 1984; the National Certificate (NC), a single national framework of modules, covers initial and continuing vocational education; the modules are studied by young people in

both full-time education (including secondary school) and part-time education (including apprenticeships and training schemes).

Our study does not provide a complete overview of modular developments in the six countries. In particular, it focuses on developments at a national, rather than a regional or local, level. Subject to this, it suggests that the experience of modularisation in initial VET has been limited. In many countries modular reforms have only recently been introduced, or are still at the planning and development stage, or consist primarily of local experimental initiatives. Only in Scotland and the Netherlands (with respect to KMBO and some apprenticeships) can we draw on experience of nation-wide modular systems over several years. The experience of these two countries also draws attention to an important feature of modularisation: that modular systems change and develop, probably faster than other systems; modular reform should not be seen as a one-off process of change, but rather the start of a continuing process of reform, whose end point can never be seen clearly at the time when the reforms are set in motion.

Explaining differences across countries

Countries vary in the proportion of VET courses, and of VET students, affected by modularisation. In Scotland and Spain, nearly all initial VET courses are (or will be) modularised. In Scotland, where many students in general education take a few vocational modules, a large majority of the age group take NC modules (60% in the late 1980s, even more among more recent cohorts) although only a minority take a large number of modules. In Spain the modules are being introduced as part of a major restructuring of secondary and post-secondary education, and the numbers of students who will take the modules is not known. In France, the CFI has catered for around 150,000 students since 1989. In Germany only a small number of initial VET students are affected. In the Netherlands, modularisation started with the relatively small KMBO sector, but is being progressively extended to most of VET at the senior-secondary level, which currently caters for more than 40% of the age group. In Luxembourg, modularisation is starting with the CITP, a small subsector of vocational education, but it may eventually be extended to other sectors of vocational and technical education.

Two factors help to explain the different pace and extent of modular reforms across countries. The first is the legal and governmental context. In Germany and Luxembourg the number and contents of training courses and the mode of certification are tightly regulated; the pace of modular reform has been slow. In the other countries studied, initial VET has been less closely regulated. Systems with strong central governments can modularise more easily, but the link between governmental structures and modularisation is less clear cut. In the Netherlands the limited powers of central government may have resulted in a slower pace of modularisation, but they have not prevented it; and in several countries, modules or their outcomes have been a basis for negotiating among training providers, social partners and other interested bodies over the content of training.

The second factor affecting the extent and pace of modularisation in a country is the level of satisfaction with existing VET arrangements. Modularisation usually accompanies wider reforms, and is intended to promote or reinforce them. Modularisation can be seen as an indicator of dissatisfaction with initial VET within a country. The scope of modularisation is an indicator of the prevailing diagnosis: where modularisation is restricted to small and specific sectors of VET, as in Germany, Luxembourg, France and (initially) the Netherlands, the basic structure of the system is not questioned; system-wide modularisation, as in Spain and Scotland, reflects a more radical diagnosis of the current problems.

There is little evidence that reforms at a national level have been strongly influenced by the experience of other EC countries. However, some of the enterprise-based experiments have been conducted cross-nationally, and there is strong interest among policy-makers in learning from EC partners, especially in the countries whose own experience of modularisation is more recent.

Modularisation within countries

Two types of courses have been most likely to be modularised. The first type comprises courses with close ties to continuing VET. For example, the CFI in France makes use of modules from the Unités Capitalisables and the AFPA, systems for the pursuit of vocational qualifications by adults; and in Germany, modules in new technologies such as CNC are available to young apprentices as well to adults. In Scotland NC modules are available to all age groups, although they were initially planned for 16-18 year olds.

Second, low-status courses have most frequently been modularised, or have been modularised first. These include courses for low-status students such as the unemployed, the unqualified and students for whom conventional courses are too difficult. Conversely, there have been few attempts to modularise high-status general or academic courses. Most modular reforms have targeted students at the bottom of the educational status hierarchy, even if they have varied in the proportion of the hierarchy that is covered. We can speculate about two possible reasons for this. On the one hand, low-status courses may have fewer vested interests to resist radical change; and because they cater for the weakest and disadvantaged students they are most often perceived to be 'failing' and in need of reform. On the other hand, the benefits of modularisation in providing individualised training routes and flexible forms of learning (see 8.3 below) may be most important in respect of these students; other students in initial VET may have less need of the 'flexibility' achieved through modularisation. Whatever the reason, there is a danger that modular training may be 'stigmatised' and become more difficult to introduce to other parts of the system. For this reason, the development of exemplary modular projects in high-status sectors of initial VET, notably by large companies in new-technology occupations, is of particular interest.

Modules have been introduced for full-time, school-based students, for apprentices (in both the school and the enterprise-based sides of the dual system) and for trainees in other institutional contexts such as the CFI in France or youth training schemes in Scotland. The institutional context of learning does not appear to be a major factor in determining whether or not modular reforms are introduced, although it may determine the design and perhaps the objectives of the reforms.

8.3 OBJECTIVES AND STRATEGIES OF MODULAR REFORMS

Objectives

At least seven proximate objectives are being pursued through modular reforms in most of the countries studied.

- (i) *Economic responsiveness*: to increase the system's responsiveness to changing skill needs. These changes may arise from changes in technology or in the organisation of production. Modules are easier to revise and update than full courses; for example, 10% of Scottish NC modules are revised each year. Moreover, where modules are defined in terms of learning outcomes they provide convenient units for planning vocational curricula. In addition, modules may be used to develop the transferable skills which are widely perceived to be more important as a result of technological and economic change (see ii below).
- (ii) *Pedagogical change*: to encourage more student-centred, self-regulated, participative and active learning. There are two main emphases in respect of this objective. First, modules based on projects or tasks are used to encourage 'learning to learn' and to develop 'transferable skills' such as personal autonomy, responsibility, decision-making and the ability to exercise initiative. These modules offer opportunities for self-regulated and

participative learning: examples include several of the modules being developed in large companies. Second, modules are used to support independent study and to allow students to work in their own way and at their own pace. This objective is typical of modular programmes designed for dropouts, the unemployed, the socially or linguistically disadvantaged and those who find it difficult to satisfy the demands of more 'conventional' courses. Examples include the KMBO in the Netherlands, CFI in France, CITP in Luxembourg and the 'module 1' which is planned for Spain.

- (iii) **Individual training routes.** Modules also cater for the diversity of individual student needs by providing combinations of modules to suit individual needs and circumstances. Again, this is felt to be of particular importance for disadvantaged students (notably in the case of the French CFI); but the flexibility of modular programmes has also been regarded, for example in Scotland, as an incentive to participate for all kinds of students, including those who are not disadvantaged.
- (iv) **Integration:** to integrate school-based and enterprise-based learning. This has been an important objective of modular reforms in Luxembourg, the Netherlands and Spain, and has been a major consideration in France and Scotland where the institutional arrangements for delivering modules are more variable. Modular reforms have also sought to bring schools closer to the world of work and to make them more 'businesslike'.
- (v) **To increase efficiency.** In several countries modularisation has been seen as a way to increase the efficiency of training. It is variously perceived to do this by reducing the high cost of conventional training, by rationalising the curriculum and reducing duplication, and by increasing success rates and reducing dropout.
- (vi) **Co-ordination:** to promote the coherence and flexibility of the vocational training system, or of a part of it. Modules are used in Scotland to promote the coherence and flexibility of a system where training is delivered by a variety of institutions, and where sources of initiative and control are dispersed. Increasingly modules are being used to perform this function in the Netherlands, to support the integration of the different branches of senior secondary vocational education, and the development of regional education and training colleges. In France the CFI is organised on a territorial basis; within each zone several functions, and the work of several agencies and individuals, must be coordinated; modules support this coordination by providing units for planning of an appropriate size and flexibility.
- (vii) **Catalyst:** to support wider changes in vocational training. In almost all countries modularisation has accompanied wider reforms of training, typically involving the curriculum, pedagogy and assessment, and sometimes changes in institutional structures. Modularisation may contribute directly to these other changes; it may also act as a catalyst for change, since the process of modularisation involves a radical reappraisal of the objectives and organisation of training. As a result it can be difficult to distinguish the consequences of modularisation from the consequences of other reforms that are carried out at the same time. Once introduced, modular systems may be more responsive to further pressures for change. For example, Scotland has been able to introduce a new system of occupational standards and qualifications much more easily than it could have done had traditional courses still been in place; the modules have also supported other education and training initiatives. In the Netherlands modules have been used to serve new objectives, with an increasing emphasis on the objectives of efficiency, economic responsiveness and coordination. In France the modular character of the CFI is facilitating the introduction of a new scheme (PAQUE) which is taking over some functions of the CFI and building on its first-level modules.

Two further possible objectives have been less frequently pursued though modularisation in initial VET in the six countries studied.

- (viii) ***Credit accumulation and transfer.*** Of the six countries studied, only France and Scotland have sought to raise participation and attainment through pursuing the principle of credit accumulation and transfer. (However this has been an objective of modular reforms in other European countries, including Portugal.) Young people receive credit for relatively short periods of learning, and can build on this credit if they subsequently return to education or training. This encourages dropouts from training, or those whose training is interrupted, to return to the system; and it provides an incentive to participate for those who may feel unable or unwilling to commit themselves to a long period of training. However, in the majority of modular reforms studied higher participation is pursued through one of the other objectives listed above (notably through pedagogical reforms), rather than by enabling students to accumulate credit incrementally. In this respect the objectives for modularisation in initial training appear to differ from those in continuing training, where credit accumulation and transfer are more important.
- (ix) ***Linking academic and vocational tracks.*** Linking academic and vocational tracks, by providing flexible pathways between them and modular programmes combining the two, has not been a major objective of modularisation in the six countries. To some extent this has happened in Scotland, where modules can be combined relatively flexibly with academic school courses; but this was not a major objective at the time that modules were introduced.

Strategies

In listing the objectives of modular reforms we have made somewhat arbitrary distinctions. In practice, different objectives are combined in different ways in any programme of modular reform, and one objective (eg pedagogical change) may be a means to achieve another (eg economic responsiveness). Moreover the objectives of modular reforms vary over time, across sectors or reform programmes within a country, and even across different actors involved in the same programme of modularisation.

At the risk of over-simplification, modular reforms may be classified in terms of their principal focus:

- (i) ***Focus on disadvantaged students:*** Several reforms, including KMBO, CFI and CITP have had as their main emphasis the support of disadvantaged students - including low-attainers, the unqualified, dropouts and the unemployed - by providing more flexible learning methods and individualised training routes. These reforms aim to help students achieve the same results (qualifications) as mainstream courses, but by different means.
- (ii) ***Focus on skills:*** Other reforms have mainly emphasised new skill demands: either in terms of the responsiveness of the VET systems or in terms of the pedagogical approaches required to develop transferable skills. This is the case of the Spanish reforms, and of most reforms and innovations in the 'dual systems' of the Netherlands and Germany. By contrast with reforms focusing on disadvantaged students, these reforms are more concerned with changing the results than with changing the means by which they are achieved.
- (iii) ***Focus on the VET system:*** The third emphasis is on the efficiency, coherence, flexibility and coordination of the VET system itself. So far Scotland is the principle example, but this may increasingly become the main emphasis of modular strategy in the Netherlands, which is moving towards an integrated system of upper-secondary VET.

These three 'foci' are not mutually exclusive; moreover, the main emphasis of modular reforms in a country may change over time. Among the six countries studied we can observe a tendency for modularisation strategies to shift over time from (i) to (ii), or from (i) or (ii) to (iii).

The three 'foci' also help to clarify some of the tensions within modular strategies: for example, between 'individual' and 'economic' goals (i and ii) or between the differentiating and unifying functions of modularisation (i and iii).

8.4 HOW ARE MODULES (AND MODULAR SYSTEMS) DEFINED AND SPECIFIED?

In most systems modules are specified in terms of most or all of the following: objectives or outcomes, content, learning processes and activities, typical duration, assessment procedures and criteria, entry requirements. Nevertheless, the concept of a module, and the design of modular systems, vary widely across the systems studied.

The literature on modularisation identifies at least four characteristics which might be used as criteria for defining modules. First, modules are small units of study. Second, each module is self-contained, in the sense of being both delivered and assessed separately. Third, modules can be studied in varying combinations and/or sequences. Fourth, the process of modularisation involves a (re)division of the curriculum.

If we applied these criteria stringently to the innovations studied above, we would probably conclude that several were not modular. However the criteria themselves are not precise. (How small is 'small'?) It is more useful to see the four criteria as dimensions of variation; in these terms we can observe considerable variation across, and within, the countries studied.

Size

Among the countries studied, the length of an individual module varies from 20-30 hours, as in the case of modules developed by Telekom in Germany, to one year or 1100 hours in the case of 'module 2' and 'module 3' in Spain. Most modules are at the lower end of this range. For example, the Scottish NC modules, and the modules in the French Unités Capitalisables system, are typically 40 hours in length; in the Netherlands modules vary from 4/6 weeks to 2/3 months. The length of modules varies within most countries; and often, notably in modular reforms with a 'disadvantaged student' focus, the length of an individual module may itself be very flexible as a major objective of modularisation is to allow students to study at their own pace.

Self-contained: separate delivery and assessment

Modules are frequently delivered in groups or clusters, rather than as separate units. In some countries, including Scotland, this is actively encouraged in order to provide better integration across modules and to structure student choice, although in principle each module can be delivered separately. Clusters can also provide convenient units for designing qualifications to match job profiles as in the Netherlands. While the concept of cluster is a loose one, it is helpful to think of modular systems as being potentially hierarchical, with clusters being more 'self-contained' than the individual modules within them.

There is similar variation in the extent to which modules are separately assessed. In some countries, including Germany, only part of the assessment is separate; there is terminal assessment at the end of the course or programme of modules, in addition to separate assessment within each module. Most systems are working towards full, separate assessment, although in several cases this is not yet fully realised. For example, most apprenticeships in the Netherlands still rely on national examinations once or twice a year, although module-based assessment is gradually being introduced.

Principles of combination

Nearly all the modular systems in our study allow in principle for some flexibility either in the combination of modules studied or in the order in which they are taken. However, we can identify at least four different principles of combination. First, in some systems, typically in the Netherlands, Germany and Luxembourg, this flexibility is likely to exist only within a particular course. Second, the same module might be studied by students on any of a wide range of courses. This is the case in Scotland and France, at least with respect to general modules. In such cases the concept of 'course' itself has less meaning, since students' occupational and educational goals may change as they progress through the modular system. Third, an individual module may be self-sufficient. This is the case in Spain (where no regular progression route is planned between modules 1, 2 and 3) and in Scotland, where a module has credit either on its own or as part of a programme. Fourth, a module or group of modules might be designed to 'add on' to a course (either a particular course or one of a range of courses) the rest of which might not be modularised. Such modules tend to be more or less self-sufficient and to have a 'skills' focus: they typically refer to particular skills or technological fields - particularly new areas or those requiring frequent updating - or they develop additional transferable skills through projects. Many modules developed in cross-national projects may be of this kind.

These principles of combination have implications for the content of modules. If a module can contribute to different courses or qualifications its contents and learning outcomes must not be defined in terms of the requirements of a particular occupation or qualification.

Principles for dividing the curriculum

There is variation in the principles by which the designers of modular systems have approached the task of dividing the curriculum. There is a loose distinction between reforms which break courses down into modules (eg the Netherlands) and reforms which create modules and then build them up into courses (eg Scotland). The latter typically have a 'system' focus: many individual modules are defined independently of particular occupations or applications, allowing the same module to be used for a variety of qualifications. The Spanish reforms reflect a somewhat different approach to the division of the curriculum: general education is being extended to 16 years for all young people, so the modules embody a new division of the curriculum between general (comprehensive) and vocational sectors.

We may also distinguish between modules defined primarily in terms of learning outcomes and modules defined primarily in terms of learning processes. These represent two different principles for dividing the curriculum. Outcomes and processes do not coincide: the same outcome may be achieved through a variety of processes, or the same process may contribute to a variety of outcomes. Most modular systems emphasise outcomes: modules defined in terms of outcomes provide a convenient basis for planning and updating the curriculum; they are more easily assessed; they allow individual training programmes to be defined following an assessment of needs; and they allow for flexibility in the means by which students, especially the disadvantaged, can reach given skill targets. However some modules are defined primarily in terms of learning processes; this is particularly true of modules based on projects or activities, such as the German 'Leittext' method. It may also be the case with modular reforms, such as those in the Netherlands, which have increasingly stressed 'manageable units of learning' as the principle for designing modules. Moreover, all modular reforms have sought to achieve reforms of teaching and learning methods, resulting in a tendency to prescribe both processes and outcomes.

Modular systems differ in several other respects, including:

Standardisation

Only in Scotland and Spain is there a nationwide currency of modules in which the length of a module, and the principles of its design, are standard across the whole system. Elsewhere the length and design of modules varies across courses, and sometimes within them. The degree of standardisation reflects the scope and strategy of the modular reform. It is likely to be greatest in reforms (as in Scotland) with a 'system' focus and where coordination, efficiency and credit accumulation and transfer are important objectives. Conversely, reforms which focus on disadvantaged students or on skills are more likely to accept a variation in the design of modules, on the grounds that each module must be designed to match variable criteria such as the requirements of a particular pedagogy, the structure of knowledge and competences within a skill area, or the need for modules to be meaningful units of learning.

The degree of standardisation may also reflect governmental factors. In some countries, such as the Netherlands and Germany, the power of central authorities to prescribe a standard format for modules is restricted. Moreover, there is a distinction between countries where modularisation is an explicit objective of policy, and those where modularisation is simply a possible method for achieving other policy objectives. In the latter case, central authorities are less likely to define standard formats for modules.

Responsibility for designing modules

Modular reforms vary in terms of the role of central government or authorities in designing and introducing modules, although in most of the reforms studied here this role has been very substantial. Second, modular reforms vary in the relative role of education ministries and other parties such as labour ministries and social partners. Third, in some modular reforms occupational standards and qualifications are revised at the same time as the new modules are drawn up. Examples include the Spanish modules and apprenticeships in the Netherlands; Scotland represents a variation on this theme, since new occupational standards have been introduced since the modules have been in place.

Where modules are delivered

We may distinguish four types of modules. The first two consist respectively of modules delivered in schools (including colleges and education centres) and of modules delivered in enterprises (including company training centres). These two types include most of the modules that have been developed in Germany, where separate training regulations make it difficult to design modules that can be delivered in both 'sides' of the dual system. The third type of module is designed for delivery in both the school and the enterprise, often with the specific intention of achieving better integration between the two types of training. (In practice this has not always been easy.) The modules delivered in the Dutch apprenticeship system, the modules proposed for Spain and Luxembourg, and many of those used in France, are of this type. The fourth type of module (exemplified by the NC in Scotland, and many CFI modules in France) allow, in principle, greater flexibility concerning where they are studied; so far most modules have been delivered in schools or colleges but in both countries there is a policy goal of developing enterprise-based learning.

Implications of different concepts of modules

There is, therefore, a wide variety of concepts of modules and of designs of modular systems represented in our study. I conclude with two further observations. First, although the dimensions listed above provide a convenient way to analyse these differences, no simple typology of modules or modular systems appears to be possible; the variations are multi-dimensional and complex. Second, although the design of modular systems reflects their objectives, the relation between objectives and design is a loose one. Similar objectives are often pursued by very

different concepts and designs of modular systems. Our study does not provide a full explanation of these differences.

8.5 WHAT ISSUES ARE RAISED BY THE EXPERIENCE OF MODULARISATION?

In the final section of this chapter I discuss some practical and other issues in the implementation of modular reforms. These issues are expressed as questions and problems. There is too little experience of modular reforms to provide certain answers and solutions; and too little of this experience has been systematically evaluated. Moreover, the great variety of objectives of modular reform, of designs of modular systems, of target groups, of institutional contexts and of innovation strategies, make generalisation difficult.

This raises the first, and perhaps the most important issue raised by our study: *to what extent are the concepts of module and modularisation sufficiently precise and agreed* to be useful tools either for the policy-maker or for the researcher analysing education and training systems? Our study has revealed a wide variation in these concepts across (and even within) countries, although it has also shown that different modular reforms have often pursued similar objectives. It has failed to identify a clear typology of modules or of modular systems, although it has suggested some dimensions for comparison.

There is another, closely related, general issue: *how can we distinguish the effects of 'modularisation' from the effects of other changes (in pedagogy, curriculum, assessment etc) which frequently accompany it?* Modular reforms have often been introduced as part of - and to support - wider changes. To what extent should these other changes be treated as necessary, or merely contingent, aspects of the modularisation process?

In this report we have not attempted to define 'modularisation' too rigorously; nor have we sought to abstract the 'essence' of modularisation from other concomitant changes. We doubt that these would be sensible tasks in our present state of knowledge and understanding. In the rest of this chapter I discuss some of the practical - and other - issues raised by the reforms studied in our research, which appear in at least some ways related to the process of modularisation.

Issues relating to flexibility

There are many types of flexibility associated with modular reforms. Here I focus on the individual student, and the flexibility either to select modular programmes, or to vary the pace and method of study to match a student's needs or interests. (These could be defined as flexibility across modules and within modules respectively.) Issues include

How desirable is flexibility? Is it of more value to adults, with their greater variety of circumstances, than to young people? Among young people, it is mainly of value to dropouts, the unemployed and other 'disadvantaged' students? Or do the weakest students benefit least from flexibility?

How easy is it to achieve? The experience of the French CFI and the Scottish NC suggests that considerable resource and organisational problems are involved in providing individually tailored programmes. In nearly all systems, the flexibility of modular combinations is less in practice than in principle. It appears to have been easier to achieve flexibility within modules than flexibility across modules.

Implications for guidance. In the French CFI there are complex arrangements for reception, assessment, guidance and follow-up; the central role of the *correspondant* reflects the importance of these functions in individualised training. Nevertheless the CFI experience points to practical

issues, such as how to prevent guidance from merging into manipulation, and the need to maintain the necessary databases.

Implications for the status of modular education. If modules are primarily seen as a way of 'tailoring' vocational education for individuals who cannot cope with more conventional courses, is it necessarily stigmatised? Are the individuals who have followed modular programmes themselves stigmatised?

Issues relating to quality

In addition to the other issues raised, which nearly all concern quality indirectly, the following issues arise:

Assessment. What additional quality assurance procedures are required, in view of the different methods of assessment (decentralised, continuous, often workplace-based) of modular training? Is it acceptable to modularise courses but to retain traditional forms of assessment (end-tests, examinations) at the end?

Confidence. Problems of quality are as much sociological as technical. When modules are used as alternative routes to regular qualifications, they may be perceived as second-class and they may be stigmatised because they serve disadvantaged students. Even when modules are used in high-status training programmes, they may be perceived as a way of cutting the cost (and therefore the quality) of training. How can modular training win public confidence and recognition?

Fragmentation and general competences. Both in the Netherlands and in Scotland there are concerns that modular qualifications focus too much on specific tasks and competences. More general and strategic skills are less visible, and get 'lost among the modules'. In addition, it is feared that effective learning may depend on a sequence of study that can be disrupted in a modular programme, and that the process of 'teaching to the module' gives few opportunities for integration. On the other hand, it is felt (especially in respect of the French CFI) that the concept of quality only has meaning in relation to an individual's own needs and interests; and in several countries modules have been used to develop general and transferable competences. Is there any necessary connection between modular training and the inclusion or omission of more general and strategic competences?

Issues relating to organisations

These issues include:

School-enterprise links. Modular reforms have frequently been used to improve the links between school-based and enterprise-based learning. In many cases the division of labour between schools and enterprises is itself changing, with more formal learning and assessment taking place at work. Creating and maintaining these links has almost everywhere proved difficult, particular in respect of small and medium enterprises, and particularly in occupations where the rhythms of work do not closely match the organisation and sequence of learning.

Organisations delivering modules. Size appears to be an important factor in the ability of both schools and enterprises to deliver modules; for small organisations, modular training can be very uneconomic. It is widely recognised that organisations (especially schools) delivering modules will need to change, although the country studies suggest that the precise nature of this change is not well understood. Some of the necessary changes reflect the changed role of teachers and trainers.

Issues relating to teachers and trainers

Gaining the support of teachers and trainers. The studies suggest that teachers and trainers are often among those most resistant to modular reforms, or most critical of them once in place. Yet their support is essential to the success of these reforms. Too often modular reforms have been 'top-down' in their approach and have failed to consult teachers or involve them in the process of modular reform. Changes in the status and remuneration of teachers and trainers - especially those teaching the least advantaged students - might also help. A system where the teachers with the lowest status and remuneration have the most demanding jobs (teaching the disadvantaged) may not be conducive to modular (or any other) reform.

Changed roles. A universal theme of the country studies is the change in the role of teachers and trainers, and the need for additional training, consequent on modularisation. The role of the teacher in a modular system typically moves away from didactic teaching, towards the organisation of students' learning, the monitoring of progress, guidance and assessment. Teachers need to update their knowledge of the subject more frequently; they also need a greater breadth of knowledge if they are to guide students' choices in a modular curriculum. They may also require to maintain closer links with enterprises or schools.

Issues relating to the system

Finally, the country studies identify several issues concerning how education and training systems should manage the modularisation process, and how modular reforms can enhance the coherence and flexibility of systems themselves. As elsewhere, the issues are closely related.

Roles. Where, if anywhere, should the main responsibility for introducing modular reforms lie? What should be the respective roles of education and industrial interests, or of central authorities and local initiatives?

Qualifications and standards. How closely should the process of designing modules be integrated with the process of specifying occupational standards and qualifications? Do modules provide an acceptable 'currency' for designing standards (as in the Netherlands or Scotland)?

Updating. Modules may facilitate the rapid updating of curricula to meet changing skill needs; but modules alone will not do this. What organisational arrangements are required for this to happen?

How 'versatile' are modules? Scotland and the Netherlands are the two countries with most experience of system-wide modularisation, but their approaches have been different. In Scotland a single framework has been designed for different sectors both of education and of employment; in the Netherlands modules have tended to be developed separately in the different sectors of education (KMBO, apprenticeship and MBO) and for the different sectors of employment. To what extent can modules be designed for flexibility and 'institutional versatility' across sectors?

Links with continuing training. Modules have often been introduced in sectors of initial training which already had close links with continuing training. Can modules be used to improve the links between all sectors of initial training and continuing training?

How can modular reforms take account of future needs and objectives? Earlier, I pointed out that the objectives of modular reforms changed over time; I also speculated that they tended to acquire a greater 'system' focus. Given the link - albeit loose - between the objectives and the design of modular systems, how should new innovations be designed to allow for future changes in objectives?

APPENDIX A

MEMBERS OF THE PARTNERSHIP

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APPENDIX B

QUESTIONS ADDRESSED IN THE COUNTRY STUDIES

CONTEXT

- 1.1 What features of the country's education and training system, of its social, economic and technological context, and of related problems and policy priorities, are relevant to this study?
- 1.2 On which sectors of the country's initial vocational education and training system does this study focus, and why?

CHARACTERISTICS AND OBJECTIVES OF MODULARISATION

- 2.1 Which sectors/types of initial vocational education and training have been (or are being) modularised? How many students are involved? What is the stage of implementation?
- 2.2 Why have these sectors/types of education been modularised? What are the aims and objectives - implicit or explicit - of modularisation? What place has modularisation within policies and models for the curriculum as a whole?
- 2.3 How is the concept of modularisation defined? What are the main characteristics of the modular system(s)? What is the scope of the modular reforms?
- 2.4 Who is responsible for the design and development of modules? Where are they provided? What are the roles of educational and work institutions, and how is collaboration between them organised?
- 2.5 Are there other relevant features of the modular reforms?

PROBLEMS, CONSEQUENCES AND IMPLICATIONS OF MODULARISATION

- 3 What problems have been experienced in implementing modular reforms? What are the (intended or unintended) consequences and implications of modular reforms? How do these problems, consequences and implications vary according to the characteristics of modular systems and the social, economic, labour-market and technological context? Answer in relation to:
 - 3.1 access to, and progression within, modular systems;
 - 3.2 the planning of training programmes;
 - 3.3 pedagogy and relations between students (trainees) and teachers (trainers);
 - 3.4 the influence of different actors on the content and standards of modular programmes and on participation within them;
 - 3.5 the attitudes and reactions to modular reforms of different actors;
 - 3.6 other important consequences and implications, or problems encountered in implementing modular reforms.

CRITERIA OF EFFECTIVENESS

4 What criteria should/could be used in evaluating the effectiveness of modularisation?

ISSUES

5 What key issues are raised by the study of these modular reforms?

APPENDIX C

FULL REPORTS OF THE COUNTRY STUDIES

(See Appendix A for full addresses of institutes)

Sigrid Jordan, Sabine Manning and Ingrid Weissflog, *The Effectiveness of New Curriculum Models for Initial Vocational Training: Modularisation*, WiFo, Berlin, May 1992. English (summary also in French).

Rosa María Gonzalez Tirados and Pedro Ortega García, *La Eficacia de Los Nuevos Modelos Curriculares para la Formación Profesional Inicial: Estudio de la Modulación*, ICE, Madrid, June 1992. Spanish and English. (Tel: +34 1 5490896)

Catherine Froissart, *La Modularisation dans le CFI (Credit Formation Individualisé): Theme 8: Petra*, FORS, Paris, June 1992. French (summary also in English). 50F. (Tel: +33 1 40091512)

Jacqueline Spence, *Modularisation in Vocational Training*, ILReS, Luxembourg, June 1992. English (summary also in French). 5ECUs. (Tel: +352 475021)

Elly de Bruijn, *Modularisation in Vocational Education and Training in the Netherlands*, SCO, Amsterdam, July 1992. English (summary also in French). (Tel: +31 20 5550357)

Cathy Howieson, *Modular Approaches to Initial Vocational Education and Training: The Scottish Experience*, CES, Edinburgh, June 1992. English (summary also in French). £10. (Tel: +44 31 650 4186)

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