MODULARISATION IN THE SCOTTISH EDUCATION SYSTEM: A VIEW FROM THE OUTSIDE

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SYNOPSIS

The article takes a look from the outside at the Scottish development and implementation of different modular systems like the *NC-Modules, SVQs, GSVQs* and the new *Higher Still system*. With the help of six different abstract criteria for modular and non-modular types of education (using the German apprenticeship system as a comparative basis) the four Scottish modular systems are categorised. The categorisation by grade of modularisation shows that many different types of modularisation exist. The profit from a detailed analysis of the Scottish modular approach in an international discussion is very high. The most important fact is the need for a clear definition of what modules are or should be.

INTRODUCTION

Scotland is a country with much knowledge and experience in constructing, implementing and running modular structures in education and training. Those modular developments make Scotland not only "a testbed for new policy developments in the UK" (OECD, 1987, p. 21), but also a very interesting example of modernisation and flexibilisation of education structures for other European countries. Despite the well known and described problems of cross national comparisons in the field of education and training (Schriewer, 1992; Noah/Eckstein, 1992; Macbeath, 1993; Raffe, 1998; Lauterbach/Mitter, 1998), the Scottish experience has the potential to provide an insight into what modules can look like and how they work in practice. Looking at Scotland from the outside the present article is an attempt to describe and judge modular approaches in relation to the Scottish education system as a whole, the structure and mechanisms of the labour market and other specific social and cultural implications (Epstein, 1992).

A VIEW FROM THE OUTSIDE

The reason for the discussion about modularisation in Germany is the fear that the traditional and more or less rigid apprenticeship system will not be able to manage the rapid changes in technology, the service sector and the qualifications needed in the labour market (Pilz, 2002a).

Following the German discussion about modularisation of the vocational education system we find various opinions on the matter (even just taking into account the discussion of German authors in the field with an international aspect in mind) (Pilz, 1999a, pp. 60-72 and pp. 204-211). If one imagines the German vocational education system as a boat at night in a stormy sea of many problems, then the scene can be observed from two distinct viewpoints. In the first, one sees the far away light of modularisation at the strange coast of an unknown education and training system. The light fired by pirates might attract the boat to the dangerous reef which could destroy the common and traditional German Dual System of vocational education. From the second viewpoint, modularisation is seen as the light in the darkness of uncertainty: the fire of a lighthouse which shows the way to a safe harbour at the coast of the new and helpful system of learning and training.

However, neither the protagonists of more modular developments in the German vocational education system nor its opponents and many authors or politicians

exactly know what modules are. Their knowledge about existing systems of modularisation in Europe is limited (Pilz, 1999a, pp. 73-88). In order to change this unsatisfactory situation some research was undertaken to gain greater understanding of the details and functions of modularisation (Gonon/Sgier, 1999; Reuling, 2000; Bruijn/Howieson, 1995; Howieson, 1992; Bruijn, *et al.*, 1993). One of the research projects looked closely at the Scottish developments and the some of the findings will be illustrated here (Pilz 1999a, 1999b, 1999c, 2000, 2001). For Scottish readers, the interesting parts of this study are the more abstract characterisation of modules in Scotland and the categorisation of different programmes of the Scottish vocational education landscape which were implemented over the last two decades. The outside view gives Scottish readers a new, and hopefully fresh perspective on modular programmes which have been implemented for a long time.

THE CHARACTERISATION OF A MODULE AS AN IDEAL TYPE

It seems to be very difficult to give a clear and well-accepted definition of modules and the process of modularisation inside the education and training system (Warwick, 1987, 1994; Theodossin, 1986; Roberts, 1987; Jonathan, 1987; Howieson, 1994; Raffe 1994, p. 141). One method to get closer to a definition is the development of more or less abstract criteria to describe an ideal type of a radical concept of modularisation (Rasmussen 1998, pp. 40-45, and a detailed theoretical explanation of the criteria and a more complex model of characterisation will be published in Pilz, 2002b).

The process to identify the relevant criteria included three steps: (1) about fifty different definitions of the concept of 'modularisation' in German and English publications were collected and screened in order to find out the relevant indicators which define modules in their purest form. (2) The most common indicators were located and similar ideas were joined together under one keyword (Pilz, 1999a, pp. 73-88) The following six following criteria were identified.

The first criterion is a clear starting point of a module and its definite end which is set by the learning content and/or qualifications in the curriculum. A determination of time to pass a module is optional. This structure allows a highly flexible combination of different modules, breaks between participation in different modules and no limitation to take modules over a period of time.

The second criterion is the large extent of standardisation of the learning curriculum, the qualifications and the methods of measuring the learning outcome. All aspects of standardisation are specified in the curriculum/descriptor.

Furthermore modularisation is an output-orientated system. This means the link between the formal learning process and the evaluation of the learning outcome is very weak. Modularisation in its purest form involves assessing someone's qualification against a standard without necessarily previously teaching this person or giving him or her advice.

Another criterion is the certification of each passed module. So every single module is well documented and has a value on its own in the education and training system or in the labour market. This is a crucial factor to give a module the character of a single standing unit.

A radical modular system, however, sets no restrictions regarding participation and the length of participation. Everybody is allowed to start the modules whenever she or he wants. Because every module stands on its own no previous knowledge, skills or qualification are required. Because of how each module is certified no one has to enrol in qualifying programmes (the meaning of the term "programme" here is "an officially implemented system" and not the specific combination of units/courses taken by an individual student).

Last but not least, there is no regulation on which training provider is allowed to offer what kind of programme. More detailed it is the question of the relation

between the curricular requirements and the ability of providers to teach, supervise and assess a module. Every approved school, college, private training organisation or company is allowed to offer modules.

(3) The criteria were brought in logic relation and integrated in a concept which covers all varieties of modularisation through relating them to different areas in the education system which they influence. The areas of the education system are parts of a structure of educational systems which was developed for international comparisons from Lauterbach/Maslankowski/Mitter (1998). Out of a wider range of different areas the most important were closely selected in relation to the relevance for modularisation (see table 1).

Table 1: Criteria for modules/modular systems as an ideal type (radical form)

Determined area in the education system	Criteria
Curriculum and the relation to other educational programmes (external view)	Restriction of learning content and/or qualifications, flexible combination of different modules
Curriculum and guidelines (internal view)	Standardisation of the learning content, the qualifications and the methods of measuring the learning outcome
Assessment	Output-orientation
Certification process	Certification of each unit
Participants	Unrestricted entrance and exit opportunities by participants
Providers	Unrestricted options to offer all types of modules by all kinds of schools and training providers

From an international point of view the Scottish non-vocational examples, like the school based Standard Grade Certificate, and the German system of vocational education are good examples of a non-modular system. The philosophy of vocational education and theoretical backbone of the German vocational system is the so-called "Berufskonzept" (vocationalism) (Deissinger, 1996). Deissinger (2000, pp. 606-607) pointed out that this "vocationalism means that training is workplace-led and predominantly practical by stressing the importance of the work experience during the training period. It also means that the system works in accordance with skill requirements defined 'around the workplace'. [...] Hence, the German 'training culture' is based on the notion that vocational training should not only be interpreted as a contractual duty, but also as an educational process." Beside the parallelity of training and education over a longer period of time the "Berufskonzept" also stands for a close framework—a set of different skills and complex knowledge in an occupational sector—which enables the holders of the qualification to transfer their knowledge within the different areas of an occupation without any further training. Furthermore, vocational qualifications in the "Berufskonzept" are certified and widely accepted e.g. by the government, industry, social partners. In this complex and wide range of vocations a certificate provides transparency in the labour market and allows

the individual to claim union rates earnings. Also the occupation still influence the status of people in the society (Blossfeld, 1994; Reuling, 1998; Sauter/Schmidt, 2002; Deissinger, 1997, 2000, 2001).

Without explaining the German Dual System (apprenticeship system) in detail (for details see the following informative and helpful publications in English: The Federal Minister for Education and Science 1992, The Federal Minister for Education, Science, Research and Technology 1996, Arnold/Münch 1996, Sauter/Schmidt 2002, Canning/Deissinger/Loots 2000, Koch/Reuling 1998, Deissinger 1994, 1997, 2001) we can argue, that within a wider range of different vocational education programmes the Dual System meets the theoretical criteria for the "Berufskonzept" very well.

In the Dual System the vocational curriculum structures and the learning contents are organised within a time frame of three years. The apprentice in a specific occupation should acquire a broad set of qualifications in a linear way. Because of the dual approach in the German system—a combination of two different places of learning and training, the workplace and the college (Berufsschule)—there is a strong link between the syllabus in college and the training regulations in the workplace. Despite the overall curriculum structures and the syllabus teachers and instructors choose the learning contents in detail, the learning aims, the methods of learning and the assessment methods (Koch/Reuling, 1998, pp. 21-26). The different Chambers, also called competent bodies (Arnold/Münch, 1996, p. 32), however, designed the interim and the final assessments of the apprentice.
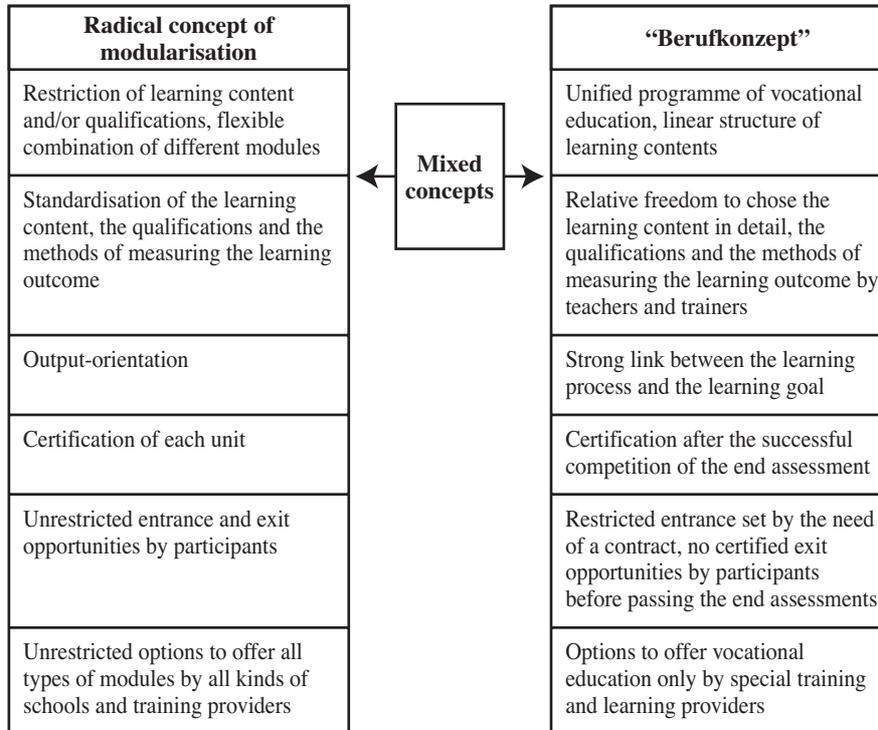
As in the Dual System the process of learning and teaching is linked with the learning goal it is only on rare occasions that candidates pass the final assessment without participating in the learning and training process as a whole. The successful completion of the external assessment is the prerequisite for the award of a certificate of vocational qualification. The philosophy of the "Berufskonzept" does not intend the assessment of single parts of the training and therefore, apprentices have no option but to stay on and complete the training if they are to achieve a certificate. The duration—but not the syllabus—of an apprenticeship might be reduced for those with high school-leaving certificates. On the other hand, employers have to commit themselves to a full provision of training, guaranteed to the apprentice by contract and accepted by the Chambers. Last but not least the Dual System is highly dependent on the existence of special learning and training environments. The "duality" of the system is created through the collaboration of companies and special training providers on the practical side and colleges (Berufsschule) focusing on the more or less theoretical side of the syllabus. The roles of the different partners in the system are clearly defined; training can only be provided by accepted companies or training providers.

According to this brief explanation we can argue that the Dual System and the underlying theoretical criteria of the "Berufskonzept" diametrically oppose the modular system (see also Koch/Reuling, 1998, p. 22). The following table gives a model in which the concept of modularisation and the "Berufskonzept" are extreme types of vocational education with a continuum of mixed concepts in between (see table 2).

CATEGORISATION OF DIFFERENT EXISTING PROGRAMMES IN THE SCOTTISH EDUCATION AND TRAINING SYSTEM

Following the development of abstract criteria and a very brief look at the realization of the "Berufskonzept" in vocational education in the German Dual System we move on to categorise different structured programmes of vocational education in Scotland. In Scotland the most common programmes include the *National Certificate Modules* (*NC-Modules*), which were introduced in 1984, the *Scottish Vocational Qualifications* (*SVQs*) implemented in 1989, the *General Scottish Vocational*

Table 2: Model for the categorisation of vocational education programmes between modularisation and the "Berufskonzept"

Radical concept of modularisation	Mixed concepts	"Berufkonzept"
Restriction of learning content and/or qualifications, flexible combination of different modules		Unified programme of vocational education, linear structure of learning contents
Standardisation of the learning content, the qualifications and the methods of measuring the learning outcome	← Mixed concepts →	Relative freedom to chose the learning content in detail, the qualifications and the methods of measuring the learning outcome by teachers and trainers
Output-orientation		Strong link between the learning process and the learning goal
Certification of each unit		Certification after the successful competition of the end assessment
Unrestricted entrance and exit opportunities by participants		Restricted entrance set by the need of a contract, no certified exit opportunities by participants before passing the end assessments
Unrestricted options to offer all types of modules by all kinds of schools and training providers		Options to offer vocational education only by special training and learning providers

Qualifications (*GSVQs*) which were piloted in 1992, and the new modular system of National Qualifications introduced by *Higher Still*. Today these different systems are not independent of each other. All *GSVQs*, and some *SVQs*, are based on *NC-modules*. The *Higher Still* framework incorporates *NC-modules*, as free-standing units or as components of new courses (for details and explanation of the different programmes see for example: Connelly, 1999; Raffe, 1997a; Howieson, *et al.*, 1997; Raffe/Howieson, 1998; Gunning, 1999a; Canning, 2001; Cloonan/Canning, 2000; Murray, 1997; SQA, 1999a,b,c,d, 2001).

Looking at the first criterion (see table 1) it is obvious that the *NC-modules* are single units each standing on its own. Although the *SVQ-system* offers a cluster of modules the student receives a certificate for each completed module which has a certain value on its own.

In contrast, although *GSVQs* are organised in clusters too, the value of a single module is low and only the certification of the whole cluster of modules has a value, for example as an entrance qualification for higher education. This is clarified through a final exam or project, which covers areas of knowledge and qualifications from all modules.

In the *Higher Still* system the accumulation of modules is even more important. It can be summarized that the certificate as a documentation of a complete set of modules and the final exam or the competition of a project work at the end of each course in combination with an external assessment is of central importance. But at the same time the opportunity to combine and link modules plays also an important role.

All four programmes are more or less standardised. The knowledge and qualifications to be acquired are defined in the curriculum or in a descriptor. In

comparison with the German curriculum in vocational education the freedom of a teacher/supervisor to influence the learning environment or to develop assessment methods is limited in Scotland.

The output-orientation (criteria 3 in table 1) can be found especially within the *NC-Modules and the SVQs*. Candidates are allowed to demonstrate knowledge or ability regarding a certain task without having participated in formal training before. In these programmes the link between formalised learning and assessment is not crucial. In *GSVQs* and *Higher Still,* however, participation in the formal learning process prerequisite the participation in an exam/assessment.

In all programmes each module is certified (criteria 4) even if the value of each certificate is very different (see above). From the Scottish point of view the single certification of each module might be regarded as the most natural thing in the world. In other countries, however, politicians and researchers try to implement their 'modular systems' without the single certification of each unit (see for example Davids, 1998).

The regulations for embarking or leaving the programmes differ. In the *NC-system* no entrance qualification in terms of general levels is required, each module stands on its own and no restriction on entering or leaving the programme exists. *SVQs* are much more restricted. Entrance to one of the five levels requires previous knowledge and/or the passing of an *SVQ* on a lower level. Although each single module (when it is an *NC-Module*) is of value it is the completion of all modules and the certification of the *SVQ* which is the objective of this programme. Even stronger are the restrictions to enter the three levels in the *GSVQs*. Because of the value of a *GSVQ* as a cluster of modules the feasibility for students to leave a course before finishing all modules is not very likely. In the *Higher Still* programme entrance restrictions in principle are set by a detailed structure of entry levels and exit restrictions are set by the strong value of the final certificate for University entrance or in the labour market.

The *NC*-system allows modules to be offered in different kinds of learning environments. In contrast *SVQs* are work based qualifications, *GSVQs* were developed by colleges and are offered mainly in those institutions, and in the *Higher Still* programme schools and colleges offer different, but overlapping, ranges of courses and modules.

The findings can be summarized as follows in table 3. But we must be very careful with the summary, because some of the criteria are open to interpretation and a simple yes/no classification is not always easy.

CONCLUSIONS FROM THE RESULTS OF THE CATEGORISATION

It could be shown that there exist many differences between the four modular programmes. In Scotland, therefore, modularisation is not a uniform way to develop a curriculum or to implement and run programmes of learning and/or training. The four programmes illustrate the various aims of the diverse programmes for different types of learners. Taking up again the allegory of the fire at the coastline it has to be stated that there is not only one single fire of modularisation but various fires. Some of them are huge and bright, others are softly glowing.

For the Scottish discussion it is of interest to combine the findings with two other aspects in order to show influence of modularisation inside the Scottish education system.

Firstly, is the range of the modular programmes in the vocational education system. It might be an oversimplification to use the term vocational education system in the Scottish context, but it would be too much to discuss the meaning of "system" in international comparative education here. Range as used here means the variety of different groups of users (for example pupils, students, adult returnees, employees,

Table 3: Comparison of different Scottish modular structured programmes by grade of modularisation

Criteria	NC Modules	SVQs	GSVQs	Higher Still
Restriction of learning content and/or qualifications, flexible combination of different modules	yes	yes	no	no
Standardisation of learning content, qualifications and methods of measuring the learning outcome	yes	yes	yes	yes
Output-orientation	yes	yes	no	no
Certification of each unit	yes	yes	yes	yes
Unrestricted entrance and exit opportunities by participants	yes	no	no	no
Unrestricted options to offer all types of modules by all kinds of schools and training providers	yes	no	no	no

retired people) who have a realistic chance to enter the programme. The accessibly and the utility to enrol in a programme presuppose the implementation of such a programme by different types of suppliers of vocational education. This in turn can only be achieved if the programme itself is of great flexibility.

SVQs were developed with the help of industry for industry and with regard to the workplace. Therefore this programme focuses strongly on the demands of employees and trainees. *GSVQs* are offered by colleges for certain type of learners, e.g. school leavers. *NC-modules,* in contrast, were developed and offered by different types of schools, colleges, training providers sometimes in co-operation with companies. Although other programmes and certificates of learning exist it can be stated that *Higher Still* (despite the problems of the integration of work based qualifications like the *SVQs*) and the *NC-modules* cover the needs of a huge range of different learning groups in the education and training system in Scotland (Raffe, 1997b; Raffe, *et al.*, 1999).

The second aspect is the process of the modular developments over time in Scotland. It can be observed that in the beginning of modularisation more radical developments took place and a switch in the programmes from a wide range inside vocational education to a narrow one and back (see arrows in table 4). Here we leave aside the well known aspect, that especially *Higher Still* not only includes vocational courses but has also a very strong focus on academic courses.

169

Table 4: Comparison of different Scottish modular structured programmes by grade of modularisation, range and by time of development

	Range of the programme inside the vocational education system	
Degree of modularisation	*Small range*	*Wide range*
Programme with some modular elements	GSVQs $\longrightarrow$	Higher Still
Radical modular programme	SVQs $\longleftarrow$	NC–Modules

SUMMARY AND IMPLICATIONS

It can be argued that the Scottish modular developments in vocational education and training tended to move from a pure modular system to a much weaker form. Only a few modular elements were integrated in current developments. Besides, the already mentioned aspects of different aims of the programmes, putting a radical modular programme like the *NC-modules* and the *SVQs* into practice causes problems (Black/Hall/Martin, 1991, 1992; Matlay, 1999; Beaumont, 1995; Croxford/Howieson/Raffe, 1991; Howieson, 1992; Clarke, 1992; Callender, 1993; Gunning 1999b). But one has to be very careful with these findings because the analysis of only four modular programmes and the limited number of criteria applied holds many dangers, e.g. oversimplification.

Furthermore, Scotland with the implementation of *Higher Still* has introduced a moderate modular system with a wide range of academic and vocational education (Raffe, *et al.*, 1998). This single framework more or less facilitates parity of esteem (SFEU/HSDU, 2001, p. 42), while from an international point of view it remains unclear if parity of esteem can only be achieved through modularisation (Raffe, 1994).

The last question to be addressed concerns the profit to be expected from a detailed view of the Scottish modular approach for an international discussion on modularisation and in particular for the German discussion. We have to ask what kind of advantage does international comparative research about modularisation have—especially the construct of extreme types—for Germany.

Three different sets of answers can be given. First of all, the research clarifies the different meanings of modularisation in different contexts. In the German discussion the weak knowledge and unawareness of different types of modules has developed an unbalanced interpretation and a single focus on the more or less radical forms of modularisation like in the N/SVQ-system. This narrow view was strengthened in the past through the uncritical use of the English term module in the German language. But as we know from the analysis and as Bynner/Chisholm (1998, p. 135) point out, "The use of English as the major *lingua franca* for international research communication might be viewed as unproblematic by many, but English terms can still take on different meanings depending on who is using them and where they are employed. Words have histories." The result of the uncritical use of the term modular was that nearly all participants in the Dual System of vocational training in Germany, even employers, fear that modules integrateted in the Dual System would destroy the well approved "Berufskonzept". Furthermore, in education policy the word "Modul" had a negative notion (and sometimes still has) and the

use of the term was often discredited. Recalling the allegory from the beginning of the article, imagining the German vocational education system as a boat at night in the stormy sea than modularisation can be compared with a pirate fire. However, this narrow view is dangerous as the German Dual Systems needs new impulses, more flexibility and modernisation to meet the challenges of new technologies, the different expectations of young people and to overcome the often noticed rigidity of the German vocational education system (Deissinger, 2001; Pilz, 2002).

The second answer concerns the implementation of a modular system. All in all in an approach of international comparative research the modular concept and the "Berufskonzept" can be defined as extreme types with a continuum of mixed models in between (Pilz, 2002b, 1999a, pp. 88-99). But what could the opposite of a modular system look like in practice? With regard to Scotland only modular programmes and systems with modular elements inside were discussed. By contrast for Germany we argued that the Dual System of training and education is an example of a more or less pure approach to follow the philosophy of the "Berufskonzept" as the opposite ideal type to a pure modular programme.

The German vocational education, nevertheless, is undergoing change though not through the implementation of a radical modular system. Over the last few years some elements of flexibility were integrated in the Dual System in order to match the needs of a rapidly changing and specialising labour market on the one hand and the requirements to give young people more individual choice to develop their personal talent on the other. One example is the implementation of optional learning units in the curriculum for some occupations e.g. in the IT sector or in laboratory (Deissinger, 2001; Pilz/Papenbrock, 2001). In these fields the regular three-year-apprenticeship is split into two parts: (1) the entrance phase in the first and second year of the apprenticeship. In this part the trainees are learning all together the basic and therefore compulsory aspects of the occupation. (2) In the second and especially third year of the apprenticeship the trainees in cooperation with the training companies and the colleges can choose some units from of a wider range of different specialised units which were added to the curriculum framework of the occupation. But even if this means more flexibility there is no separate certification of the each unit and only one overall assessment at the end of the apprenticeship resulting in one certificate.

Furthermore, the certification of some supplementary qualifications in the Dual System were developed like a special certificate for foreign language knowledge (Pilz, 2001, 2002a). This certificate is a single standing one and not part of the ordinary apprenticeship. The certificate is offered at three levels of competence and is defined by standards which were tested without offering special courses (no or only a weak link between learning and assessment) in the "Berufsschule" (college).

Therefore it seems to be possible to assume, that the German vocational education is shifting away from a radical model of the traditional "Berufskonzept" to a more moderate one. But given the totally different philosophies of vocational education and training in Scotland and Germany this is not automatically synonymous with a convergence of the two approaches.

The third set of advantages of the research is the aspect of learning from problems of already implemented approaches in other countries. If in the German vocational education system some aspects of the modular system were implemented, it would be crucial to look very closely at the Scottish experience in order to prevent the duplication of difficulties. It is, however, of great importance to gain understanding of the problems of modularisation in Scotland and to learn about the different types of modularisation as they differ from type to type. For example, the problem of unrelated modules and the "incoherent choice from an inadequate range of options" (Raffe, 1994, p. 149) in the former Scottish NC-system is of less importance in modular systems with a cluster structure which give coherence and guidance.

Summarising it can be stated that the most important fact is the necessity of a clear definition of what modules are or should be and the advantages and problems of developing, implementing and running of modular programmes in practice. Differing conditions in different countries could result in different meanings of modularisation and different shapes. Or in other words it is crucial for the success of the voyage that the helmsman examines the lights on the unknown shore carefully before taking a decision where to head.

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