

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/242770319>

The contrast between modular and occupational approaches to modernising vocational training

Article

CITATIONS

11

READS

807

1 author:



Matthias Pilz

University of Cologne

196 PUBLICATIONS 1,434 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Modularisation in VET [View project](#)



Japan Research Transition and Training [View project](#)



The contrast between modular and occupational approaches to modernising vocational training

Social, economic and technical developments present education and training in Europe with a major challenge. If a modern system of vocational training which meets the challenges is to be provided for young people, consideration needs to be given to how to modify and update that system. Two different approaches to modernisation are modularisation, practised particularly in the United Kingdom, and the further development of the occupational approach, which is taking place for example in Germany.

The Scottish NC modular program as an example of modularisation

It is helpful to look at specific examples in order to clarify the meanings of approaches. One country with a complex modular approach is Scotland, which is regarded as highly innovative, has longer experience of comprehensive modularisation than England and Wales, and has implemented particularly wide-ranging schemes (OECD 1987). Scotland has had a modular system since 1984. It adopts a purist approach and has led Raffe (1988, p. 162f.) to conclude that 'moves towards modularisation are found in many other countries, but rarely in the thoroughgoing form in which it has been applied in Scotland.'

The system currently consists of around 4000 different National Certificate modules (NC modules).¹ Each module has a standard length of 40 teaching hours and is set out exactly in a statement called a 'descriptor'. This contains precise operationalised details of the range of content

and of the knowledge and skills to be taught. These are checked and documented in accordance with specified procedures. The methodology and media to be used are laid down less precisely, the descriptor merely containing suggestions rather than binding instructions. Students are entitled to sit modular tests without having followed a formally regulated course of learning. Since the method of learning is open while the learning outcomes are standardised, these modules are also described as 'output-oriented'. The modules are developed by the quasi-governmental Scottish Qualifications Authority (SQA) in collaboration with experts in education. In addition, the development teams also check and update some 300 NC modules each year. The SQA is also responsible for certificating and documenting modules taken as part of the Scottish Qualifications Certificate, which is recognised by the State. Since the modules may be offered by a wide range of public and private institutions, such as secondary general schools, colleges, private educational providers and companies, the SQA monitors the quality of providers and approves them. The time taken to teach a module varies from place to place. In schools, modules are taught over a period of 13 weeks, each module requiring 40 teaching hours, while in industry the time taken is usually appreciably longer.

Anyone over the age of 14 years may participate, with no set enrolment requirements. There is no division into levels of ability, as occurs in other modular programmes such as the English NVQs and Scottish SVQs (NCVQ 1995; SQA 1997a and 1997b), nor do examination results allow for differentiation in performance,



Matthias Pilz
Co-ordinator of EC vocational education programmes at the regional government in Lower Saxony in Hanover (Bezirksregierung Hannover)

and lecturer at the University of Lüneburg

From the example of the Scottish 'National Certificate' modular system, and the German Dual System of vocational training, it is possible to identify the characteristics of two opposite archetypes of training: the pure modular approach on the one hand, and the pure occupational approach on the other.

A continuum of intermediate models of vocational training can be drawn up between these two contrasting approaches to training. The author then analyses two innovative examples, one in Scotland and the other in Germany. He suggests how each of these schemes differs from its reference model by incorporating elements of the opposite model. The author demonstrates that each case departs to only a limited degree from the norm and concludes that it would be dangerous to speak of a process of convergence.

(¹) With the introduction of a comprehensive reform of the Scottish education system in autumn 1999, the NC modules became part of the Higher Still system (cf. SQA 1999a, 1999b and Pilz 1999b) and are now known as National Units, though remaining largely identical in form. The NC modules outside the Higher Still system may only be started up until summer 2002, and must be completed by 30.09.2004 (SQA 1999c).

**Fig. 1****Indicators of a modular approach**

- Learning units restricted in time and content
- Flexible order of learning units
- Highly standardised objectives, content and testing procedures
- Output orientation
- Separate certificate for every learning unit
- Open access: freedom to join and leave at any time
- Not tied to a place of learning

since there is no grading system. Some prior knowledge is desirable but no evidence of ability is required for participation. Students are free to combine modules as they wish, as there are no restrictions on these. Because each module is certificated separately, it is possible to take just one module or to combine a large number of modules from different subjects, or from one subject area for the purpose of specialisation. Students may interrupt their learning or rejoin the NC modular system at any time, any modules already passed still being recognised (Howieson 1992; Connelly 1999 and Scotvec 1996a).

If the NC modular system is described as particularly radical, the question arises as to why it should be thought so. The typical features of the educational philosophy underlying the modular system can be summed up in terms of the following processes:

- Recognition of partial skills, and their certification, with quality guaranteed through standardisation.
- Teaching and availability of specific skills within companies.
- Focus on the individual needs and requirements of participants.
- Rapid adaptation to changed circumstances and/or the requirements of the labour market.
- A lifelong learning orientation.

In addition to the general features of a modular approach, specific indicators can

be deduced for the practical implementation of a modular system. It is evident that NC modules are learning units limited in time and content, and may be taken in a flexible order. At the same time, the information in the descriptors leads to considerable standardisation of objectives, content and testing arrangements. Attention has already been called to the heavy emphasis on output orientation, standardisation making it possible to divorce the learning process from the learning outcome. Another peculiarity is the separate certification of each module. Lastly, one of the features of a module, as laid down for NC modules, is that learners are not generally tied to a particular place of learning.

If the characteristics of NC modules are abstracted and generalised (see Fig. 1), they may be regarded as indicators of an ideal modular approach.

The German Dual System as an example of training using an occupational approach

The Dual System in Germany (the Federal Minister for Education and Science 1992) currently covers some 360 different occupations recognised by the State. Besides combining colleges and enterprises as places of learning, it focuses on both complex, transferable vocational training and the development of comprehensive operational competence and personal development for young adults, within a system sponsored on the one side by the social partners, and on the other by State agencies. The notion of occupations plays a key role in the design of both the content of the vocational training system and of its formal arrangements. The educational philosophy behind the occupational approach can be described in terms of the following indicators, which can only be summarised briefly here (cf. Blossfeld 1994; Steedman, Mason and Wagner 1991; Pilz 1999a, p. 91-93; and Deißinger 1994, 1996 and 1998):

- The range of skills taught is complex and transferable between employers.



❑ The State exercises a coordinating role and ensures transparency by means of recognised occupations.

❑ The scheme has long-term stability, thereby creating continuity in the vocational training system; at the same time, each individual training process is a lengthy and sustained process of learning and socialisation.

❑ Pay scale and status are governed by the recognised occupation in question.

❑ The training produces an occupational identity and sense of purpose, and the educational element fosters personal development.

Alongside the somewhat abstract determinants of the occupational approach, particular features of the application of that theory can be identified at the practical level (see Fig. 2). One of these features is that the syllabuses are very broad in terms of the acquisition of wide-ranging operational competence and take up a considerable length of time, the learning contents being arranged in a linear sequence. Another feature is that the syllabuses leave those teaching them appreciable freedom in choosing how they translate learning objectives, content, methods and examination procedures into practice. With the exception of a few special arrangements, the learning process and the achievement of learning objectives are very closely inter-related in the Dual System. It is generally not possible to take a final examination without having taken part in the learning process. Furthermore, it is not possible to obtain a certificate, which documents the skills and knowledge acquired and is guaranteed by the State, without successfully completing a course of training. Those who drop out or decline to sit the examination receive no credit under the Dual System for partial performance. This system also provides for a conditional right of access, which usually takes the form of commitment to a training contract with a company, and indirectly for a conditional right to leave, since a certificate is only awarded on completion of the entire training process. The final feature of the practical implementation of the occupational approach is that it assumes a particular place of learning. As a rule, training is tied to

Indicators of an occupational approach

Fig. 2

- ❑ Overall syllabus
- ❑ Linear arrangement of elements of learning
- ❑ Relative freedom of choice in objectives, content, methods and testing procedures
- ❑ Learning process linked to learning objective
- ❑ Certificate at end of course
- ❑ Restricted access, subject to certain conditions
- ❑ Right to leave indirectly subject to certain conditions
- ❑ Tied to a place of learning

the training company and the State vocational school (*Berufsschule*) under the Dual System.

Combining the Scottish and German experience into a general model

The modular and occupational approaches can be regarded, according to the indicators set out above, as ideal types forming opposite poles.

This makes it possible to express the two ideal types as opposite extremes, and to establish a continuum between them along which mixed forms can be located using the indicators developed above (see Fig. 3). These mixed forms may derive in their simplest form from one of the two extreme types, but adopt elements of the opposite approach, or may represent true mixed forms derived from neither of the two extremes. Which mixed forms of vocational training occur in practice will be analysed next.

The GSVQs as an example of moderate modularisation in Scotland

Another Scottish training programme will be described here by way of example, and located on the continuum.

Forty-six different General Scottish Vocational Qualifications (GSVQs) were devel-



Fig. 3

Model for defining training programmes

Occupational approach	Modular approach
Overall syllabus	Learning units restricted in time and content, and flexible order of learning units
Linear arrangement of elements of learning	Highly standardised objectives, content and testing procedures
Relative freedom of choice in objectives, content, methods and testing procedures	Output orientation
Learning process linked to learning objective	Separate certificate for every learning unit
Certificate at end of course	Open access: freedom to join and leave at any time
Restricted access, subject to certain conditions	Right to leave indirectly subject to certain conditions
Right to leave indirectly subject to certain conditions	Tied to a place of learning
Tied to a place of learning	Not tied to a place of learning

Occupational approach	Mixed approach	Modular approach
Dual System	?	NC modular system

particular places of work, and were complemented by general subjects such as mathematics and languages. One particular feature was that the final examinations at Levels II and III took the form of projects in which students had to demonstrate the knowledge and skills learnt from all modules forming part of their GSVQ. Unlike the NC modules, a grade was given, differentiating between 'not (yet) been successful to pass', 'passed' and 'passed with distinction' (Murray 1997 and Scotvec 1996b and 1996c).

When the GSVQs are examined in the light of the indicators established earlier, the following results are obtained.

On the one hand, the individual modules within the GSVQ are, like NC modules, subject to much standardisation of content because of what is laid down in the descriptor, while certification of each module is also guaranteed.

On the other hand, the emphasis in GSVQs is primarily on the overall context of a continuous learning process, on learning outcomes and on coherence between all modules. The final examination demonstrates this position most clearly. While the individual modules are documented in the Scottish Qualifications Certificate, it is only an overall pass in GSVQs which counts for anything in the education system (e.g. in admission to higher education) and in the labour market. The points system and the overall grade given in the certificate are evidence of this approach at an institutional level. From a teaching point of view as well, great stress was laid by the SQA and the colleges on students' gaining an overall qualification, and this was manifested in advice sessions and the structure of teaching. The learning process was constantly being adjusted to satisfy the nature of the examinations, and teachers were given greater freedom in ordering teaching content than in the case of NC modules. It cannot therefore be said that there was an output orientation.

As already indicated, GSVQs were developed primarily to be offered in colleges, and were therefore suited to college conditions. As a result, a focus on a place of learning was planned in from the start. The fact that students were not free to

oped from 1992 by the SQA and a predecessor organisation in collaboration with teachers, employers and other education and training experts, and it was possible to integrate a considerable number of NC modules into the new programme.⁽²⁾ GSVQs were sets of modules designed specifically for Scottish colleges and were offered at three levels of difficulty, each level requiring evidence of a higher degree of prior attainment to join, generally in the form of modules previously passed. At Level I, the lowest, a GSVQ consisting of 12 modules was offered, which allowed some choice out of a range of optional individual modules, thus allowing for a particular career direction. For the GSVQs offered in 14 different occupational fields, such as commerce and industry or care, a variety of modules had to be chosen at Levels II and III according to a points system, some from a compulsory core, and others from a group of options. Some modules were offered and therefore recognised at both Levels within an occupational area. The contents of the individual modules were job-specific but not tied to

⁽²⁾ The introduction of the Higher Still system meant that that GSVQs ceased to be independent from 1999/2000 (cf. SQA 1999a; 1999b and Pilz 1999b). In the Higher Still system they nonetheless appear in a different form, as part of the Scottish Group Awards for instance, and are particularly well suited to form the basis for investigation of lines of development.



join and leave a GSVQ programme when they liked was closely allied to this dependency on a place of learning: students were bound by what the colleges provided, which was usually simply a linear succession of GSVQs over one academic year. However, since the modules directly built on one another, it was frequently not even possible to join or leave during a year. Moreover, it was necessary to have taken all modules in order to pass the final examination, which further restricted flexibility of participation.

If the indicators of the modular approach are now looked at as a whole (see Fig. 4), it is evident that GSVQs are clearly moving away from a pure modular approach and towards a mixed approach.

A mixed system is suggested not only by the indicators at system level. The underlying educational philosophy also reveals a move away from that of a pure modular approach. Partial adoption of elements of the occupational approach is evident particularly in the priority given to a comprehensive and complex range of skills in GSVQs, both from a structural standpoint and in the assessment of students. There is therefore no evidence of any predominance of the teaching of partial skills or of any orientation towards extremely specific skills for a narrowly defined range of jobs in the educational philosophy underlying the GSVQs.

New recognised occupations in Germany as an example of a move away from a rigid occupational approach

Since 1997, some new recognised occupations have come into existence in Germany, and these demonstrate previously unknown degrees of flexibility. Occupations in the fields of information technology, the media and laboratory work differ, however, in the actual degree of flexibility (Dybowski 2000). The new structure of laboratory training in chemicals, biology and paints as from March 2000 will be presented here by way of example (cf. Bundesminister für Wirtschaft und Technologie 2000; and Reymers 2000).

Fig. 4

Presence of indicators of modular approach in GSVQs

Learning units restricted in time and content, and flexible order of learning units	O
Highly standardised objectives, content and testing procedures	X
Output orientation	O
Separate certificate for every learning unit	X
Open access: freedom to join and leave at any time	O
Not tied to a place of learning	O

X = Yes; O = No

The training is divided into three different skill areas. Six different integrated skills, such as safety at work, environmental protection and work organisation and communication, are taught throughout the entire training course, normally lasting 3.5 years, in all three laboratory occupations, albeit in varying breadth and depth. In addition, specific skills are compulsory for each occupation. These are indispensable if students are to acquire comprehensive operational competence, and they are taught largely during the first half of the course. Seven different areas of compulsory skills are laid down for laboratory trainees working in biology including, for example, how to carry out tasks in microbiology and molecular biology, and diagnostic tests.

The third area of skills relates to optional units, which are taken in the final third of the course and must be chosen from among a wide-ranging list of job-specific and more general skills. In the job-specific section, work in botany or parasitology is, for example, among the minimum of four and maximum of six optional skills laid down for laboratory trainees working in biology. In the general section, at most two skills may be chosen, e.g. the uses of chromatography or familiarity with quality management.

Despite the possibilities of choice, stress is laid on the teaching of comprehensive operational competence, and intermediate and final examinations remain an in-



Fig. 5

Presence of indicators of occupational approach in new arrangements for laboratory training

Overall syllabus, linear arrangement of elements of learning	O
Relative freedom of choice in objectives, content, methods and testing procedures	X
Learning process linked to learning objective	X
Certificate at end of course	X
Restricted access, subject to certain conditions, and right to leave indirectly subject to certain conditions	X
Not tied to a place of learning	X

X = Yes

O = No

tegral part of the new training arrangements. However, the optional skills selected are taken into account in the trainee's final examination.

If the indicators of an occupational approach are applied (see Fig. 5), the only shift away from the typical characteristics that can be seen is the greater freedom to choose which skills are learnt. A degree of specialisation in abilities and knowledge is available where practicable and within the competency of the training enterprise. Some account may also be taken of the particular interests and inclinations of the trainee. All other aspects remain as they were, however. It is, for instance, not possible to take a test or

receive a certificate in an individual skill, and it is still a compulsory requirement to enter into a training contract. This governs some of the key features of the occupational approach.

No differences can be seen in educational philosophy. The regulations even refer explicitly to training to carry out a recognised occupation, including the capacity to plan, work and check one's work independently (Bundesminister für Wirtschaft und Technologie, 2000).

Conclusion

The two approaches to modernising vocational training described above may be analysed using the indicators established. In the case of Scotland, the GSVQs are found to represent a retreat from a radical modular approach.⁽³⁾ The greater flexibility in the new German training arrangements, on the other hand, suggests a move away from a rigid occupational approach. Whether it can be assumed from this that vocational training systems are converging is questionable, however, given the fundamental differences in education systems, and will depend on longer-term developments. Careful observation and thorough analysis of the various European approaches to modernising vocational training can nonetheless provide useful pointers for future developments and can suggest how mistakes may be avoided in each country.

Bibliography:

Blossfeld, Hans-Peter (1994), Different Systems of Vocational Training and Transitions from School to Career - The German Dual System in Cross-national Comparison. In: CEDEFOP [Ed.], The Determinants of Transitions in Youth, Berlin, pp. 26-36

Bundesminister für Wirtschaft und Technologie (2000), Verordnung über die Berufsausbildung im Laborbereich Chemie, Biologie und Lack vom 22.03.2000 [printed in the Bundesgesetzblatt Teil I, p. 257 of 29.03.2000], Bielefeld

Connelly, Graham (1999), Curriculum Development in Further Education. In: Bryce, Tom G.K.; Humes, Walter M. [Eds.], Scottish Education, Edinburgh, pp. 594-604

Deißeinger, Thomas (1994), The Evolution of the Modern Vocational Training Systems in England and Germany: a comparative view. In: Compare, Vol. 24, No. 1, pp. 17-36

Deißeinger, Thomas (1996), Germany's vocational Training Act: its function as an instrument of quality control within a tradition-based vocational training system. In: Oxford Review of Education, Vol. 22, No. 3, pp. 317-336

Deißeinger, Thomas (1998), Beruflichkeit als 'organisierendes Prinzip' der deutschen Berufsbildung [Wirtschaftspädagogisches Forum, Vol. 4], Markt Schwaben

⁽³⁾ EA comprehensive analysis of all Scottish education and training programmes including the new Higher Still system shows a clear retreat from what used to be a radically modular approach (Pilz 1999a, pp. 145-156).



- Dybowski, Gisela** (2000), Dynamisierung und Gestaltungsoffenheit der beruflichen Bildung. In: Personalführung, Vol. 33, No. 7, pp. 16-22
- Howieson, Cathy** (1992), Modular Approaches To Initial Vocational Education And Training: The Scottish Experience [A Report for the Petra Research Programme], Edinburgh
- Murray, Jim** (1997), General Scottish Vocational Qualifications (GSVQs) in Relation to the Six Themes of the Post-16 Strategies. In: Lasonen, Johanna [Ed.], Reforming Upper Secondary Education in Europe [Institute For Research. Publication Series B, Theory into practice 92], Jyväskylä, pp. 219-223
- NCVQ** [National Council for Vocational Education] (1995), Your introduction to NVQs and GNVQs, London
- OECD** (1987), The Organisation and Content of Studies at the Post-Compulsory Level –Country Study: Scotland, Paris
- Pilz, Matthias** (1999a), Modulare Strukturen in der beruflichen Bildung -eine Alternative für Deutschland? –Eine explorative Studie am Beispiel des schottischen Modulsystems [Wirtschaftspädagogisches Forum, Vol. 9], Markt Schwaben
- Pilz, Matthias** (1999b), Die Modularisierung des schottischen Bildungssystems – Aktuelle Entwicklungen auf dem Weg zu einem einheitlichen System von allgemeiner und beruflicher Bildung. In: Die berufsbildende Schule, Vol. 51, No. 10, pp. 329-334
- Raffe, David** (1988), Modules and the Strategy of Institutional Versatility: The First Two Years of the 16-plus Action Plan in Scotland. In: Raffe, David [Ed.], Education and the Youth Labour Market: Schooling and Scheming, London, pp. 162-195
- Reymers, Margret** (2000), Neues Strukturkonzept in der Laborausbildung im Bereich Chemie, Biologie, Lack. In: Berufsbildung in Wissenschaft und Praxis, Vol. 29, No. 5, pp. 5-8
- Scotvec** [Scottish Vocational Education Council] (1996a), Catalogue of National Certificate Modules session 1996-97, 14th edition, Glasgow
- Scotvec** [Scottish Vocational Education Council] (1996b), Catalogue of Specifications for GSVQs National levels I, II and III -Session 1996-97, 4th edition, Glasgow
- Scotvec** [Scottish Vocational Education Council] (1996c), Guidelines on the new GSVQ additional assessments, Glasgow
- SQA** [Scottish Qualifications Authority] (1997a), SVQs –A User's Guide, Glasgow, Dalkeith
- SQA** [Scottish Qualifications Authority] (1997b), SVQs –The competitive edge, Glasgow, Dalkeith
- SQA** [Scottish Qualifications Authority] (1999a), Qualifications for Life, Glasgow, Dalkeith
- SQA** [Scottish Qualifications Authority] (1999b), A Framework for Lifelong Learning –A Profile of the Scottish Qualifications Authority, Glasgow, Dalkeith
- SQA** [Scottish Qualifications Authority] (1999c), Higher Still Update –Higher Still phasing. In: ontrack –The SQA Newsletter for Training Providers, No. 4, p. 4
- Steedman, Hilary; Mason, Geoff; Wagner, Karin** (1991), Intermediate Skills in the Workplace: Deployment, Standards and Supply in Britain, France and Germany. In: National Institute Economic Review, No. 136, pp. 60-73
- The Federal Minister for Education and Science** (1992), Vocational Training in the Dual System in the Federal Republic of Germany, Bonn