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Competence-based VET in the Netherlands: background and pitfalls[*]

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1   Introduction

The concept of competence has become very popular in the Dutch Vocational Education and Training (VET) system, both at the level of policy-making and the level of educational practice. Competence-based education is the leading paradigm for innovation, both at the system level and at the level of learning environments. This is one of the main conclusions formulated by Van Merriënboer, Van der Klink and Hendriks (2002) in their study on the concepts of competence and competence-based education, carried out for the Educational Council of the Netherlands. An example of this trend is that competence-based professional profiles are currently being developed in Dutch secondary vocational education at the national level. These serve as a basis for designing competence-based education programmes. In higher vocational education, many educational programmes can already be described as competence-based (Mulder, 2003). Therefore, the introduction of competence-based vocational education in the Netherlands is an interesting case for educational researchers. Competence thinking also appears to have made its way back into education in the United Stated (U.S. Department of Education, National Center for Educational Statistics, 2002) and in various countries in Europe (Descy and Tessaring, 2001).

An important reason for the popularity of the concept of competence is the expectation held by many stakeholders in the VET field that the gap between the labour market and education can (and will) be reduced through competence-based education. The underlying idea is that vocational education should enable students to acquire the competencies needed in their future professions, and in society as a whole. Additionally, while working as professionals, they should continue to develop their competencies so that they are able to react to and anticipate future developments in their work (and outside) (Jenewein, Knauth and Zülch, 2002). In this respect, lifelong learning can be defined as "a continuous, stimulating and supporting process, initiated in regular education, supporting needs, possibilities and experiences of persons, to develop their ability to acquire competencies necessary for

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personal development and professional functioning in their own organisations and the rapidly changing society" (Lans, Wesselink, Biemans and Mulder, 2004, p. 77). Thus, there is a growing recognition of the need for vocational education to be directed at developing competencies, and not just at acquiring a diploma; the emphasis has to be on capabilities and not on qualifications. Capability is an important prerequisite for employability. Shifting the emphasis to developing capabilities is therefore assumed to improve the link between education and the labour market (Mulder, 2004). Moreover, according to Mulder (2004), recognition of informally gained competencies and the testing of these competencies acquired outside the educational system also play an important role, not only in the Netherlands but also in many other countries (Descy and Tessaring, 2001). Additionally, there is public interest in recognising these informally gained competencies, as unnecessary costs can thus be avoided. Finally, the tendency to design vocational education on the basis of competencies is influenced by the current Dutch government policy to only determine the global outlines of future vocational education programmes and not to define fragmented qualification structures.

The notion of competence-based education also receives a lot of attention in the research on Dutch VET (see e.g. Van Merriënboer, Van der Klink and Hendriks, 2002). The Dutch Programme Board for Educational Research formulated the following main questions to be examined in VET research carried out in 2003: How do processes of competence development take place in learning environments in vocational education? How can these processes be conceptualised and explained? Which factors have a direct influence on these processes, and how can competence development processes be optimised? These main questions refer to three different themes that are all related to processes of competence development and determining factors of such processes: 1) learner characteristics and competence development; 2) design of learning programmes and environments; and 3) the role of teachers and supervisors of practical internships in the learning environment. Research on competence-based assessment can be integrated in each of these themes (PROO, 2002).

This article provides a critical reflection on the usefulness of the competence movement for the development of Dutch VET. The article starts with an historical analysis of competence-based education in various countries to shed light on the attractiveness of competence-based education for Dutch VET. The concept of competence is explored and possible pitfalls and roads for future development are sketched.

2 Background

2.1 Competence-based education in retrospect

Interest in competence-based education and training arose in the 1960s and 1970s as a result of various publications on competence-based organisational training and competence-based teacher training in the United States. In their study "On competence. A critical analysis of competence-based reforms in higher education", Grant et al. (1979) concluded that

competence was a broad term, and that the competence-based education programmes that he and his colleagues had studied were very diverse with respect to their theoretical orientation, their scope, their intentions and their scientific focus (see also Mulder, 2004). Grant et al. defined competence-based education as follows: "Competence-based education tends to be a form of education that derives a curriculum from an analysis of a prospective or actual role in modern society and that attempts to certify student progress on the basis of demonstrated performance in some or all aspects of that role" (Grant et al., op cit, 6).

Competence-based education and training have a long history. Achtenhagen and Grubb (2001) trace the first task analysis approaches back to Moscow in the 1860s. Victor della Vos developed methods for task analysis, partly based on the conditioning theory of Pavlov, and soon these methods found their way into the American movements for manual and technical training. Competence-based approaches usually start with a task analysis in which jobs are broken down into single tasks, resulting in skill-based instruction and training. Nijhof (2003) also stresses a long history of competence-based education, referring to Bobbitt's approach in the 1920s of a scientific analysis of human actions to identify underlying abilities needed for high performance. A behaviourist approach for directly translating task descriptions into behavioural attainment targets in the 1960s led to single S-R responses in programmed instruction chains. Cognitive learning theories replaced these programmed instruction models in the 1970s.

During the 1970s, the "competency movement" (see e.g. Friedlander, 1996; Lucia and Lepsinger, 1999; McAshan, 1979; Parry, 1998) was characterised by detailed analysis of the various behavioural aspects of professional tasks. Tasks of professionals were dissected in the particular component parts, resulting in long lists of fragmentised behavioural elements. Competence-based education became primarily associated with behaviourism, mastery learning and modular teaching (Mulder, 2004). This approach turned out to be unfruitful, which resulted in decreasing interest in the original competency movement in the 1980s (Mulder, 2003).

In Australia and the United Kingdom, competence-based education has been implemented as a crucial part of national training reform agendas. In Australia, the National Training Framework was implemented to increase Australia's competitiveness in the marketplace (Velde, 1999). According to Velde, reform in Australia is now settling in two broad directions: a fundamental reform of the Australian System for Apprenticeships and Traineeships and the transformation of upper secondary school. In her opinion, "Australia and the United Kingdom possess many similarities both in the method of implementation and the behaviouristic stance adopted towards competence-based training ...... both systems appear to have been based on the behaviouristic approach to competence, with little thought given to other, more holistic approaches. Although research attempts are being made to explore more holistic conceptions of competence (….), these appear, in the main, not to be applied to actual practice" (Velde, 1999, p. 438-439). James (2002) states of the Australian scene that competence-based training tends to be conservative in nature: it enhances the development of procedural, technical knowers and adaptable workers, instead of reflective

problem-solvers and innovators. The cause of this conservatism is the standardisation involved in the curriculum development methods (backward mapping from job requirements to learning trajectories; cf. Den Boer and Nieuwenhuis, 2002).

With respect to competence-based VET in the United Kingdom, Boreham (2002) argues that the competence-based training model behind the UK National Vocational Qualifications (NVQ)-system is 'mechanistic, reductionist and denies the importance of human agencies in processes of learning'. In the NVQ-system, school-based learning is erased because of the claim that any theory taught in college would be inert because active knowledge is necessarily constructed through performance in the workplace. In a Taylorist industrial age this leads to empty skills in a low-skilled economy (Payne, 2000). Modularisation often goes along with competence-based curricula. This reinforces the disintegrative approach to job analysis. The same argument applies to the use of behavioural assessment techniques: these tend to measure only the overt, routine aspects of tasks.

So, in the Anglo-Saxon literature, competence-based education does not generally have a positive connotation. A rigid backward mapping approach, in which the state of the art on the shop floor is the untouchable starting point for the definition of occupational competencies, leads to routinised job descriptions, in which the proactive and reflective worker is left out (cf. the canonisation process, mentioned by Brown and Duguid, 1996). Achtenhagen and Grubb (2001) conclude that competence-based training is appropriate for a Taylorist world, but is an inadequate preparation for the highly-skilled workplace, where flexibility and problem-solving abilities are required.

Despite the objections made against competence-based education and training, countries have continued to adopt competence-based systems during the last decades. According to Arguelles and Gonczi (2000, p. 9), "the educational framework for addressing the deficiencies of vocational education and training has become, in an increasing number of countries, competence-based education. This can be defined as education based on outcomes and pre-determined standards, on what students can do ….". Moreover, competence-based education has continued to evolve in countries where the system has been in place for some time. For example, in Australia, competence-based education is now quite different from how it was originally introduced (Miller, 2001).

Arguelles and Gonczi (2000) examined the implementation of competence-based education and training in a number of countries. They provided case studies of the application of competence-based education and training to VET systems in countries including Mexico, Australia, Costa Rica, France and New Zealand. According to Miller (2001), these case studies provide insight into the implementation of competence-based education into various cultural and educational systems and show the importance of having the various stakeholders (particularly government, industrial bodies, the education profession and enterprises) working together with a common purpose.

In the ongoing debate on competence-based education, Arguelles and Gonczi (2000) clearly support the continuation of an integrated approach to competence-based education. In this

respect, Hyland (2001) suggests that the authors have expressed a general and sometimes uncritical commitment to VET reform along competence-based education and training lines. According to Miller (2001), there are still many unresolved issues and much more research is needed before competence-based education can be regarded as meeting the expectations of its proponents.

In the recent German and Dutch discussions on competence-based education, a more holistic approach is advocated, to overcome the risks of the disintegrative approaches. In these discussions, competence is regarded as the integrated abilities required to cope with complex tasks. Boreham (2002) suggests work-process knowledge as an innovative approach, embedding and integrating specific jobs in full production processes. Work-process knowledge should enable workers to have an idea of the meaning of their job in relation to other tasks and jobs. In the recent policy debates on Dutch VET the same holistic approach is seen as a vehicle for educational innovation and the introduction of lifelong learning. Toolsema (2003) concludes, however, that although the policy device is a holistic approach, the practical design of learning processes and assessment procedures is still based on a narrow definition of tasks and competencies. Van der Klink (2003) describes the same movement: the holistic approach is often used as window dressing for behaviourist instruction. He argues that assessment is the drawback to a holistic competence-based education approach.

To conclude, competence-based education was historically based on a behaviourist model of training and learning, within a Taylorist industrial model. In the recent competence-based movement, a holistic approach is normatively put forward, but in practice the pitfalls of a disintegrative S-R model are still great. Modularisation and assessment techniques are pushing educational practice back to the traditional mechanistic and reductionist approach. In his critique of Bastiaens and Martens (2003), De Jong (2003) argues that implementing IT tools in vocational education is reinforcing this tendency, by delivering virtual, individual training trajectories. De Jong states that competencies "… should not be acquired, but should be developed in a collective community of practice and knowledge." In this view, competence is not only a technical aspect of work, but should be seen as culturally embedded.

2.2 The current popularity of the concept of competence

Competence-based education has rapidly become very popular both in vocational educational practice and in the policy field in the Netherlands and other countries as well. Its attractiveness to schools and other VET institutes lies first of all in the emphasis that the concept places on the positive side of education and learning. Making people competent has a more positive, and also a more practically relevant, connotation than making up for their knowledge deficits. The approach matches well with the culture of advancement and empowerment espoused by many in educational practice. VET teachers also feel that, because of its practical relevance, competence-based education can motivate students to finish their school much more than traditional education can. Moreover, through their direct contacts with work organisations, VET institutes notice immediately how modern companies,

occupations and jobs are changing, encouraging schools to deliver graduates with broad skills in addition to specific knowledge.

As mentioned above, the main reason why competence-based education has gained so much popularity in the VET policy arena is its alleged capacity to reduce the gap between the school system and the labour market. There is a belief among policy-makers that graduates educated under a competence regime will be better able to perform in jobs required by modern organisations than those with traditional qualifications. Also, the notion of competence-based education fits very well within the policy discourses of employability and lifelong learning. Competence systems carry with them the promise of rendering learning processes and outcomes that are measurable and manageable throughout their life span. On a related note, the concept of competence can easily be linked to the performance approach of learning and education made popular by ideas on core competencies of organisations (Prahalad and Hamel, 1990). The latter reason is another example of the perceived potential inherent in the concept of competence to bridge the education-work divide.

An interesting phenomenon in the whole competence discussion at the practice and policy level is the tendency to largely ignore the disadvantages that may be associated with it. Over the last five years a major bandwagon effect has been visible among Dutch schools and VET institutes, when it comes to shifting to the competence paradigm. From an academic point of view, this is all the more pressing because of the serious lack of scientific research and theory to underpin its claim to fame. What we do know from the earlier competency movement that peaked during the 1970s, but also from more recent UK experiences with National Vocational Qualifications and Investors in People programmes, is that the risk of bureaucratisation of an essentially good idea is very real. The question is warranted to what extent competencies are perhaps viewed as a panacea for all problems of an educational and labour market nature. For example, can one system, whether competence-based or not, realistically serve all stakeholders in the practice, policy and political arenas? Can student dropout rates really be substantially reduced by introducing another educational model? Such questions deserve to be asked and answered, but to date they are not very prominent in the competence discussion at the practice and policy level.

A final, rather different take on the popularity of the concept of competence revolves around the question to what extent schools are already working according to the competence arrangement without referring to it as such. In other words, when does competence-based VET 'officially' become competence-based VET? The lack of a clear definition does not help much in this matter, but it seems that many schools have been using teaching practices and methods that are at least compatible with competence-based education for some time already. Notions around self-directed, participatory and project-based learning, for instance, may differ from each other but are similar – and compatible with competence-based education – in that transferring subject matter is no longer their primary concern. Instead, they focus on the way in which learners (co-)construct situated knowledge and learn to learn (collaboratively) by doing so. To a certain extent, therefore, the popularity of the competence approach may be a case of old wine in new bottles.

2.3 Defining the concept of competence

As mentioned above, the concept of competence has a fairly long history in education and training research and practice. Nowadays, the notion of competencies as integrated capabilities has become very popular. Reviewing the many studies on competence development, however, it is possible to conclude that the concepts competence and competence-based education are still very diffuse and require clear definition and conceptualisation. It would therefore not be prudent to present a fixed definition of the terms competencies and competence, so we adopt a working definition from which to proceed. In this connection, Mulder (2001) formulated the following working definition for the term competence, taking the opinions of other relevant VET researchers into account: Competence is the capability of a person (or an organisation) to reach specific achievements. Personal competencies comprise integrated performance-oriented capabilities, which consist of clusters of knowledge structures and also cognitive, interactive, affective and where necessary psychomotor capabilities, and attitudes and values, which are required for carrying out tasks, solving problems and more generally, effectively functioning in a certain profession, organisation, position or role. Building upon this definition, competence-based education implies creating opportunities for students and workers, close to their world of experience in a meaningful learning environment (preferably professional practice) where the learner can develop integrated, performance-oriented capabilities for handling the core problems in practice.

Van Merriënboer, Van der Klink and Hendriks (2002) carried out a study to determine whether it is possible to harmonise the concept of competence. After a literature study and expert consultation, they also concluded that many conceptions of competence exist, both in theory and in educational practice. Competence as a concept turned out to be (too) elastic. This raised the following question: what are the commonalties with respect to the concept of competence in various sectors and contexts? They derived six common characteristics of competencies, as defined by relevant authors in the field: 1) competencies are context-bound; 2) they are indivisible (knowledge, skills and attitudes are integrated); 3) they are subject to change; 4) they are connected to activities and tasks; 5) competencies require learning and development processes; and 6) they are interrelated. Therefore, in their opinion, the concept of competence is valid, although the relationships with other concepts such as key qualifications and expertise can be quite strong.

3 Pitfalls in competence-based VET

This section discusses several possible pitfalls in applying competence-based education. The overview starts with conceptual and institutional problems, then several technical issues are presented, and finally problems related to the implementation of competence-based education within the context of Dutch VET are dealt with.

3.1 The concept of competence

As Van Merriënboer, Van der Klink and Hendriks (2002; see also Toolsema, 2003) have shown, there are many conceptual definitions of competence and competency. There is little consensus on the meaning of these concepts among the many researchers and authors (see also Van der Sanden, De Bruijn and Mulder, 2003). Also in practice, institutional actors and colleges use different descriptions. This sometimes serves as an excuse for defining competencies as one likes, decreasing the trustworthiness of the concept (Mulder, 2000, 2003). According to Nijhof (2003), designing competence-based curricula, learning processes and assessment procedures can only be done fruitfully, when competence is operationalised as unambiguously as possible. Therefore, it is necessary to understand the underlying learning processes (cf. Van der Sanden et al., 2003; Onstenk, 2003; Simons, 2003). On the other hand, it is important to avoid competence jargon while actually designing and implementing competence-based education and to choose a more practical approach (Mulder, 2003). In this respect, a common vision of the desired competencies should be reconstructed in interaction with all actors involved (students, teachers, social partners, government; Simons, 2003).

3.2 Standardisation

A second pitfall is an over-reliance on standardisation of competencies, whereas the power of competence-based education lies in its context-embeddedness. Usually, the reality of work is quite different from job descriptions and organisational regulations on paper (Klarus, 2003). Using overly standardised competencies is really missing the point, since every abstraction from actual practice makes them less applicable. Related to the problem of standardisation is the belief in forecasting techniques: competence standards should describe jobs in the future, for which students are educated, but they can only describe jobs from the past (cf. Den Boer and Nieuwenhuis, 2002). Too strict a use of competence standards leads to conservative training, instead of preparing students for innovative developments.

Competencies are more than the sum of their composing parts, so a certain context-independence should exist. However, the risk of bureaucratisation looms large when attempts are made to separate the system of (required) competencies from actual work practice. The potential power of working with a concrete set of meaningful competencies will soon be lost as a result (Klarus, 2003).

3.3 School and workplace learning

Thirdly, it is often underestimated how hard it is to integrate learning in schools with learning in the workplace (Klarus, 2003). Different actors are involved, speaking different languages, coming from different cultural and historical backgrounds, and pursuing different interests. It is no wonder that aligning the two different learning systems is so difficult. However, the distinction between the two settings should be reconsidered (Klarus, 2003): in a sense this boundary is artificial, because in the end it is all about individual students, learning in different places at different times, constructing and adjusting their mental models of the

reality of work. Trying to ensure some form of continuity throughout their learning pathways (e.g. by developing their metacognitive skills) may be easier than solving the integration problem at system level.

According to Simons (2003), the implicit character of workplace learning leads to a major problem (how to foster implicit learning?) that should be taken into account in designing learning arrangements and environments both in school and in the workplace. Onstenk (2003) raises the question whether a new mix of implicit learning, guided learning and self-directed learning is needed. People should be made aware of their competencies and ways of learning, but this requires different approaches in the workplace than in school settings. Formalising work-based learning for acquiring standardised competencies is still an unsolved dilemma in designing effective pathways to becoming competent. This aspect has specific consequences for competence-based education but holds for vocational education and training in general.

3.4 Determining learning activities

Specifying the competencies to be acquired by students does not automatically result in the design of effective learning activities. Planning, designing and implementing effective ways of learning require specific attention. Many authors in this field argue that learning arrangements and pathways should be based on principles of social, constructivist learning (cf. Van der Sanden et al., 2003; Simons, 2003, Mulder 2003). Teachers should work in multi-disciplinary teams to design new competence-oriented learning activities, using existing practical periods and on-the-job training. Translating competence-oriented goals into actual learning activities is crucial in the implementation of competence-based education. If the implementation gets stuck at the preparation phase and/or does not get carried into the execution phase, true innovation will fail. In this respect, students should not only develop work-related competencies, but also learning competence if they are to be equipped for lifelong learning (Mulder, 2003; Van der Sanden et al., 2003).

3.5 Assessment of competencies

A fifth pitfall is that assessment of competencies, especially in work situations, is a labour-intensive and time-consuming exercise (Jellema, 2003). It is hard to standardise and often involves structured observation rather than classroom examination. Developing and using valid and reliable assessment tools is a crucial but very difficult task. Moreover, the criteria for the quality of assessment become stricter as its importance increases (cf. Nieuwenhuis, Van Berkel, Jellema and Mulder, 2001). For example, if selection or certification rather than self-development is the main goal of assessment, it is even more crucial to use high-quality instruments and tools (cf. Roelofs and Sanders, 2003). Also here the dilemma between national standards for assessment and local flexibility is pressing (cf. Nieuwenhuis et al., 2001). Since traditional assessment methods are ill-suited to a competence-based curriculum, schools, enterprises and institutional actors have to find new ways to develop appropriate assessment tools (cf. McClelland, 1973).

3.6   Changing teacher roles / identity

The extent to which the role of teachers (and students!) changes can easily be overlooked when competence-based education is implemented (Jellema, 2003). The teacher is supposed to switch from the role of an expert, transferring knowledge to a coaching role, guiding students' learning processes. Students are supposed to take responsibility for their own learning, whereas the teacher used to be in charge. This requires a totally different attitude from both parties, perhaps even a paradigm shift. Achieving this challenge is all too easily forgotten by policy-makers, talking about implementing competence-based education.

3.7   Competence-based management

In developing competence-based education, it is essential that structural attention is paid to competence development of teachers and school managers. "Practice what you preach" should be the leading principle. According to Mulder (2000), competence-based management implies an open culture and co-operation. If these conditions are not met, competence-based management will be a failure. Management itself has to "walk the talk"; otherwise people at lower levels in schools will perceive it as an ordinary management tool, instead of appreciating it as a supporting strategy to develop both the school organisation and the individual.

4   Concluding remarks

The recent development of competence-based education in Dutch VET has raised an innovative challenge for both teachers and policy-makers at all levels in the system. However, it should be recognised that the concepts of competence and competence-based education have been in use for a long time in education and human performance technology. Competence-based education is seen as an alternative for working with qualifications and qualification structures, as has been the case in Dutch VET during the last 20-25 years. In fact, both approaches are based on the same assumptions: qualifications and competencies are both derived from job analysis and forecasting techniques and are both used as input for curriculum development and for assessment of learning outputs. So the innovative flavour of competence-based education can easily become "old wine in new barrels", especially when job requirements are translated into fixed goals for educational pathways.

However, introducing competence-based education in Dutch VET has raised substantial interest in and support for developing and introducing teaching-learning arrangements in the direction of flexible pathways and self-directive learning, according to the principles of socio-constructivist learning theories. The introduction of competence-based education stimulates and facilitates the development of customised pathways, in which students, teachers and masters on the shop floor can build learning communities. This creates a paradox in the competence-based education movement: at the level of learning processes it is expected to deliver more flexibility, whereas at national level, competence-based education fits well in the trend towards standardisation based on job descriptions. Most of the pitfalls

and dilemmas described have to do with the balancing of local flexibility with national standardisation. To guarantee the exchange value of qualifications, and to regulate (financial) duties and rights, national arrangements are needed. But often, national regulations hinder local flexibility and professionalism. The discussions concerning competence-based education in Dutch VET can be understood within the context of this system-level dilemma.

A holistic approach to competencies is difficult to establish (cf. Toolsema, 2003): empirical scaffolds are urgently needed. For curriculum and assessment instrumentation, an analytical/atomistic approach can easily be adopted from the older competence-based education movement: this adoption can be observed in the daily policy practice of the Dutch VET system. To use competence-based education as a vehicle for flexible VET trajectories, in which students and teachers have a large quantity of self-steering power, requires debate and measures at the national level: the policy instruments for financing, accreditation and assessment are built on features of the older competence-based education movement, based on fixed goals and an atomistic approach. Flexible VET for a knowledge-based economy requires policy instruments that enable self-steering by students and tailor-made trajectories fitted to the requirements of local labour markets. A knowledge-based economy requires more than knowledge from professionals. Current society demands more individual independence in the context of work, which requires coping with uncertainty, taking calculated risks, making deliberate but informed choices. This requires competence (cf. Mulder, 2004).

References

Achtenhagen, F. and Grubb, N.W. (2001). Vocational and occupational education: pedagogical complexity, institutional diversity. In: Richardson, V. (ed.). Handbook of Research on Teaching. Washington: AERA, pp. 604-639.

Arguelles, A. and Gonczi, A. (eds.) (2000). Competency Based Education and Training: A World Perspective. Balderas, Mexico: Editorial Limusa S.A. de C.V. Grupo Noriego Editores.

Bastiaens, T.J. and Martens, R.L. (2003). ICT en competentiegericht onderwijs. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Boer, P. den and Nieuwenhuis, A.F.M. (2002). Wendbaar beroepsonderwijs. Lessen uit groen onderwijs. Wageningen: Stoas.

Boreham, N. (2002). Work process knowledge, curriculum control and the work-based route to vocational qualifications. In: British Journal of Educational Studies, 50, 2, pp. 225-237.

Brown, J.S. and Duguid, P. (1996). Organisational learning and communities-of-practice: towards a unified view of working, learning and innovation. In: Cohen, M.D. and Sproull, L.S. (eds.). Organisational Learning. Thousand Oaks, CA: Sage Publications, pp. 58-82.

Descy, P. and Tessaring, M. (2001). Training and Learning for Competence. Second report on vocational training research in Europe: executive summary. Luxembourg: Office for Official Publications of the European Communities.

Friedlander, P. (1996). Competency-driven, component-based curriculum architecture. In: Performance & Instruction, 35, 2, pp. 14-21.

Grant, G., Elbow, P., Ewens, T., Gamson, Z., Kohli, W., Neumann, W., Olesen, V. and Riesman, D. (1979). On Competence. A critical analysis of competence-based reforms in higher education. San Francisco: Jossey-Bass.

Hyland, T. (2001). Book review of Competency Based Education and Training: A World Perspective by A. Arguelles and A. Gonczi (eds.) (2000). In: Journal of Vocational Education and Training, 53 (3), pp. 487-490.

James, P. (2002). Discourses and practices of competence-based training: implications for worker and practitioner identities. In: International Journal of Lifelong Learning, 21, 4, pp. 269-391.

Jellema, K. (2003). Competentiegericht leren binnen een AOC. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Jenewein, K., Knauth, P. and Zülch, G. (2002). Kompetenzentwicklung in Unternehmens-prozessen. Aachen: Shaker.

Jong, F.P.C.M. de (2003). Leren in en voor een beroep. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Klarus, R. (2003). Werkplekleren en leerresultaten. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.).Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Klink, M.R. van der (2003). Competenties en hoger onderwijs: stand van zaken en toekomstperspectief. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Lans, T., Wesselink, R., Biemans, H.J.A. and Mulder, M. (2004). Work-related lifelong learning for entrepreneurs in the agri-food sector. In: International Journal of Training and Development, 8 (1), pp. 72-88.

Lucia, A.D. and Lepsinger, R. (1999). The Art and Science of Competency Models. Pinpointing critical success factors in organizations. San Francisco: Jossey-Bass Pfeiffer.

McAshan, H.H. (1979). Competency-based Educational and Behavioral Objectives. Englewood Cliffs: Educational Technology Publications.

McClelland, D.C. (1973). Testing for competence rather than for "intelligence". In: American Psychologist, 28 (1), pp. 423-447.

Merriënboer, J.J.G. van, Klink, M.R. van der and Hendriks, M. (2002). Competenties: van complicaties tot compromis. Over schuifjes en begrenzers. Den Haag: Onderwijsraad.

Miller, P. (2001). Book review of Competency Based Education and Training: A World Perspective by A. Arguelles and A. Gonczi (eds.) (2000). In: Journal of Workplace Learning, 13 (6), pp. 260-261.

Mulder, M. (2000). Competentieontwikkeling in bedrijf en onderwijs. Inaugural address. Wageningen: Wageningen University.

Mulder, M. (2001). Competentieontwikkeling in organisaties. Perspectieven en praktijk. 's-Gravenhage: Elsevier Bedrijfsinformatie.

Mulder, M. (2003). Ontwikkelingen in het competentiedenken en competentiegericht beroepsonderwijs. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Mulder, M. (2004). Education, Competence and Performance: On Training and Development in the Agri-Food Complex. Inaugural address. Wageningen: Wageningen University.

Nieuwenhuis, L.F.M., Berkel, H. Van, Jellema, M. and Mulder, R. (2001). Kwaliteit getoetst in de BVE. Kwaliteit en niveau van aanbod en examinering in het beroepsonderwijs en de volwassenen educatie. Zoetermeer: Stuurgroep Evaluatie WEB/OC&W.

Nijhof, W.J. (2003). Naar competentiegericht beroepsonderwijs? In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Onstenk, J.H.A.M. (2003). Leren en beroepsgerichte didactiek: onderzoek naar het hart van het beroepsonderwijs. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Parry, S.B. (1998). Just what is a competency? (And why should you care?). Training, June 1998, 58-64.

Payne, J. (2000). The unbearable lightness of skill; the changing meaning of skill in UK policy discourses and some implications for education and training. Journal of Educational Policy, 15, 3, 353-369.

Prahalad, C.K. and G. Hamel (1990). The core competence of the corporation. In: Harvard Business Review, May-June, pp. 79-91.

PROO (2002). Programma Onderwijsonderzoek 2003. Den Haag: NWO/PROO.

Roelofs, E.C. and Sanders, P.F. (2003). Beoordeling van docentcompetenties. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Sanden, J.M.M. van der, Bruijn, E. de and Mulder, R.H. (2003). Ontwikkelingen in het onderzoek op het terrein van het beroepsonderwijs. In: M. Mulder, Wesselink, R., Biemans, H., Nieuwenhuis, L. and Poell, R. (eds.). Compentiegericht beroepsonderwijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Simons, P.R.J. (2003). Competenties verwerven met en zonder instructie. In: M. Mulder, R. Wesselink, H. Biemans, L. Nieuwenhuis and R. Poell (eds.), Compentiegericht beroepsonder-wijs. Gediplomeerd, maar ook bekwaam? Houten: Wolters Noordhoff.

Toolsema, B. (2003). Werken met compententies. Naar een instrument voor de identificatie van competenties. Doctoral dissertation Twente University.

U.S. Department of Education, National Center for Educational Statistics (2002). Defining and assessing learning: exploring competency-based initiatives. NCES 2002-159, prepared by E.A. Jones and R.A. Voorhees, with Karen Paulson, for the Council of the National Postsecondary Education Cooperative Working Group on Competency-Based Initiatives. Washington, D.C.: U.S. Department of Education.

Velde, C. (1999). An Alternative Conception of Competence: implications for vocational education. In: Journal of Vocational Education and Training, 51 (3), pp. 437-447.