

Developing competence-based VET in the Netherlands

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Abstract

The concept of competence becomes more and more the basis for the (re)design of vocational education and training (VET). In competence-based VET academic disciplines are no longer the starting point for curriculum development. However competence needed for working in practice is. Competence-based learning is a dominant trend in VET in several countries because of the expected decrease of problems in the transition from school to work. Although competence-based learning is a popular concept, there is no univocal conceptual framework. In this paper a study is described in which by means of a Delphi study a conceptual framework for competence-based VET is developed. Next this conceptual framework is used in practice to see to what extent the conceptual framework is supported, applied and recognised. The results of the case studies show that the conceptual framework has an added value for the participants in practice.

Introduction

The concept of competence becomes more and more the basis for the (re)design of vocational education and training (VET). In the present knowledge economy, globalisation, technical innovation, and information and communication technologies are common and critical added value is gained from the continuous application of knowledge to the enhancement and innovation of work processes, products and services (Harrison & Kessels, 2004).

According to Velde (1999) the concept of competence-based learning can facilitate learning in an economy characterised by rapid changes and complexity. Competence-based learning is a dominant trend in VET in Australia, the UK, the United States and the Netherlands (Velde, 1999; Descy and Tessaring, 2001) because of the expected decrease of problems in the transition from school to work (Biemans *et al.*, 2004). This decrease is expected because one of the starting points for competence-based learning is the fact that in competence-based VET academic disciplines are no longer starting point for curriculum development. However competence needed for working in practice is.

Although the concept of competence-based learning is popular, there is no univocal conceptual framework of what competence-based learning contains. Several authors did make a start with defining competence-based learning (Klarus, 2004; Mulder, 2004; Onstenk *et al.*, 2004); there is still a need for a thoroughly validated conceptual framework, and therefore the first objective of this study is to construct a validated framework for competence-based VET.

The popularity of the concept of competence-based VET has resulted in the situation that many institutions are developing and trying to realise a competence-based curriculum. In the second part of this study the value, the applicability and the recognisability of the conceptual framework, developed in the first part of this study is determined in the practice of VET. Both parts of the study described in this paper are contributing to a higher goal. A side-effect of the popularity of the concept of competence-based VET is that there are institutions that claim to have a competence-based curriculum. However, when one takes a closer look, in some institutions only superficial changes in the curriculum have taken place, and the actual learning processes did not change. Therefore, to measure the added value of competence-based VET an instrument should be available to distinguish between VET institutions that do provide a competence-based study program and institutions that apparently say they do, but in practice still provide a more traditional study program. This study tries to realise some first steps in the development towards such an instrument.

Theoretical framework

Competency-based education is a concept that has existed for several decades and has its origin in the USA. In the 1960's it was labelled as performance-based teacher education (Olesen, 1979). During these years competency-based

education was characterised by its detailed analyses of behavioural aspects of professional tasks. Tasks of professionals were described in detailed lists of fragments and assessable elements. Although this was in the 1960's and 1970's, in the USA the concept of competency still knows a rather detailed and fundamentally behavioural approach (McClelland, 1998). Barnett (1994) says that competencies described in a behaviouristic way cannot provide guidelines for an educational curriculum because of the detailed level of description. The concept Grant *et al.* (1979) studied in the 1960's and 1970's is different from the current approach to competence in Europe. In Europe a more holistic and comprehensive approach of competence is being used (Eraut, 1994; Biemans *et al.*,2004).

In the holistic approach of competence, learning is seen from a more social constructivist perspective. The basic assumption for this originally social psychological approach is that humans construct their (social) reality by interacting with others (Simons, 2000). Everyone constructs its own truth. So learning should no longer be seen as a stimulus-response phenomenon. Learning requires self-regulation and the building of conceptual structures through reflection and abstraction (Von Glaserfeld, 1995). The holistic and social constructivist view of learning, 'new learning' (Simons *et al.*,2000) has been of major influence on the approach of competence-based learning used in this study.

In the remaining part of this theoretical framework the most important theoretical concepts that were the basis for the conceptual framework for competence-based education are described briefly. This description ends with a first set of ten principles for competence-based learning (Mulder, 2004), which was the starting point for the Delphi study.

Also on the basis of the experiences in the United States, where competence-based education became not a real success because of its detailed character, in the Netherlands there was more and more a plea to use larger and useful units as starting points for developing curricula. This ended up in more interest in vocational core problems, job competence profiles and job pictures. These developments resulted in the following principle: Verify in which jobs and roles the students end up after they completed their studies and determine which vocational core problems are the most important in those jobs and roles.

The fragmentation in education mentioned in former parts of this article has a distinct influence on the curricula. These developments lead to a plea for curriculum integration (Tanner and Tanner, 1995). Theory and practice have to be increasingly integrated. Coherent and comprehensive units from practice have to be central in curriculum planning. These developments resulted in the following principle: on the basis of essential problems from practice vocational core problems are developed, which are leading for curriculum development.

Already in the 1970's McClelland (1973) argued that the rewarding of development should be organised by means of transparent and criterion based assessments. In the case of assessments rewarding of competence development should be measured before, during and after the learning trajectory. These developments result in two different principles. First principle is that rewarding of competence developments should be done by means of assessment and by means of different assessors. The second principle concerning assessment concentrates on the following: before the learning trajectory the competencies that are already developed have to be assessed.

An essential characteristic of competence is the integration of knowledge, skills, and attitudes. In learning trajectories this integration has to be realised to make sure an assignment from practice can be carried out successfully. It is important that students are able to make representations of practice (Eraut, 1994). Moreover for students it is important to situate their (learning) experiences in practice, so they realise which learning activities contribute to their successful performance in practice. Critical reflection on the diversity of tasks and problem situations a student meets in practice (Schön, 1983) is essential for competence-development. Critical reflection realises an expansion and deepening of learning experiences and these processes are responsible for competence-development. These theoretical constructs result in three principles. First principle is that learning has to be situated in recognisable and meaningful context. Second principle is that connecting theory and practice is necessary. Let students acquire

experience and let them reflect on these experiences. The last principle is that knowledge, skills and attitudes should be offered integrated in learning trajectories.

During the design of learning trajectories for competence-development it is important to support the learning process of students and dependent of their progress to increase the autonomy of students (Van Merriënboer, 1997). To give students full opportunity to develop, it is necessary to offer activating and inspiring learning environments in which all their developmental possibilities are stimulated. This construct leads to the following principle: Make possible that students are increasingly responsible for their own learning process and let them steer their own learning process.

In a learning environment, which is based on competencies, the student is part of a community of practice (Wenger, 1998). Students are seen as junior colleagues instead of students or trainees. Teachers are coaches and experts, who are taking part in the knowledge construction of the students by means of a respectful dialogue. These theoretical insights are leading to the following principle: teachers have to be stimulated to fulfil their role as coach.

Competence-development can be realised for each individual by means of personal development plans and portfolios in which the competence-development can be recorded. According to Onstenk (1997) it is important to pay attention not just to competencies that are important for performing a job; competencies for communication, learning or designing for example are important competencies as well to survive in the current society. Competence-based curricula have to prepare students for lifelong learning. This concept leads to the last principle: In curriculum a basis must be realised to develop competencies for the future career, with specific attention for learning to learn competencies.

The (theoretical) insights mentioned differ to what extent they are exclusive for competence-based learning. However, all principles together comprise the concept for the development for competence-based learning. For the clarity the ten principles are listed below.

1. Verify in which jobs and roles the students end up after they completed their studies and determine which vocational core problems are the most important in those jobs and roles.
2. On the basis of critical problems from practice vocational core problems are developed, which are leading for curriculum development
3. Developments should be rewarded by means of assessment and by different assessors.
4. Before the beginning of the learning trajectory the competencies that a student already has developed have to be accredited.
5. Learning has to be situated in a recognisable and meaningful context.
6. It is necessary to connect theory and practice. Let students acquire experience in practice and let them reflect on these experiences with the help of theory.
7. In learning trajectories knowledge, skills and attitudes should be offered integrated.
8. Students should be increasingly self responsible and self-steering in their learning processes.
9. Teachers have to be stimulated to fulfil their role as coach.
10. In curriculum a basis must be realised to develop competencies for the future career, with specific attention for learning competencies.

The separate theoretical constructs are validated by several scientific studies. But the principles as a set are not validated yet; it is still more or less a pure theoretical construct.

Method

Starting point for this study was a first list with ten principles for competence-based learning (Mulder, 2004). The choice to use a Delphi study was made because several experts in the field of competence-based learning were enabled to

give their opinions on the list of principles for competence-based learning. Making use of different experts of different research institutes enlarges the chance that people involved in VET support the conceptual framework and are going to use it. A group of fifteen experts participated in the Delphi study. The participants were selected on the base of their expertise in the field of competence-based learning and came from eight different (research) institutes in the Netherlands.

The Delphi study originally is a study to get a shared result through a set of sequential questionnaires interspersed with summarised information and feedback of opinions derived from earlier responses (Delbecq *et al.*, 1975). The Delphi study in this contribution consisted of three rounds. The first round was a meeting. During this meeting the first set of principles was discussed. The results of this discussion were processed. In the last two rounds the participants were asked to complete a questionnaire. In this questionnaire they could mark to what extent they agreed with the changed principles and the operationalisation of these principles. They could score from 1 "I fully agree" to 5 "I don't agree at all" and they also could include comments. The scores and comments of the participants were processed. The scores were used to see the overall opinion about a principle and its operationalisation. The comments were used to change the principles. In the final decision-making regarding the changes always three researchers had to agree on the suggested change. The Delphi study was finished at the time the participants did not suggest convincing changes anymore and the overall score of each principle was satisfying.

All fifteen participants joined the first meeting. In the second round ten of the fifteen participants returned the questionnaire. In the third round seven of the fifteen participants returned the questionnaire. A Delphi study requires commitment of its participants for a longer period of time. In this particularly case the Delphi study took almost one year. Unfortunately not all participants were able to keep commitment to the end, because of changing circumstances (other job for example) or unexpected time restraints. None of the participants stopped participation because of dissatisfaction in relation to the content or procedure of the Delphi study. Despite these facts, it is not clear to what extent the reduced amount of participants has influences on the quality of the final result. To try to reduce this possible effect to a minimum, all participants (including the ones who did not respond to a questionnaire) are constantly informed about the progress of the Delphi study. Because of the fact they did not react at all, the conclusion can be drawn that they do not disagree with the results.

In order to analyse and explore the conceptual framework for competence-based learning in the context of educational practice, three case studies were conducted. The case studies had mainly an explorative character (Yin, 1984) and served three purposes:

- a) Validation: to further support the conceptual framework with participants from practice;
- b) Applicability: to explore with participants from practice to what extent the conceptual framework is useful in educational practice;
- c) Recognisability: to explore to what extent the participants in practice recognise their own educational process in the conceptual framework.

The three case studies were situated in institutions for vocational education and training. These institutions provide education in junior secondary, senior secondary, and higher vocational education and started three to five years ago with the developments towards competence-based learning. In these institutions the process of development and realisation of competence-based VET is analysed and described. The conceptual framework mainly is an instrument that influences the development process of competence-based education. Therefore the focus in the case study was on the process of developing competence-based learning and the role of the conceptual framework in this process. The following aspects of the situations are analysed: vision on competence-based learning, the composition of the group

that was responsible for the development, time span of the realisation, clearness of the project plan, clearness of the desirable final situation.

To get a clear picture of the situation at each institution the following research activities are done:

- Analyzing policy papers regarding the development towards competence-based VET;
- Interview with a manager responsible for implementing competence-based VET;
- Group interview with the team that developed competence-based VET;
- Group interview with three to five involved teachers;
- Group interview with five to ten involved students;
- Observations of relevant learning and assessment processes.

The results of these research activities are processed in a case study report for each institution. In these reports the process towards competence-based learning is described.

Results

In this part of the paper the results of both studies are described. Firstly the results of the Delphi study are described, secondly the results of the case studies are described.

Delphi study

The result of the Delphi study is a conceptual framework for competence-based learning. The renewed list with principles consists of eight principles. Some major changes have taken place in comparison with the first set of ten principles. Firstly, separate principles concerning ‘feedback’ and ‘acknowledging earlier developed competencies’ are combined in the current principle on assessment. Secondly the role of students has changed. In the former set of principles self-steering of students was mentioned. In the renewed set self-steering is replaced by (self)-reflection. Next, the former principles did not mention anything about learning in several contexts; in the new set of principles this is added. Finally, in the first set of principles the role of the teacher was being a coach. During the Delphi study it appeared to be important also to mention the role of the teachers as an expert in this principle. These principles are seen as a starting point for a conceptual framework for competence-based learning. Besides a shared conceptual framework another goal of these study was to develop an instrument to distinguish between VET institutions that do provide a competence-based study program and institutions that apparently say they do, but in practice still provide a more traditional study program. To develop this instrument per principle four phases are defined. These four phases represent the development stages of competence-based learning. Table 1 presents the principles including the description of the four phases.

Table 1 Framework for competence-based learning

Principle	Not competence-based	Starting to be competence-based	Partial competence-based	Completely competence-based
1 The competencies, that are the basis for the study program, are defined.	There is no job competence profile put together.	There is put together a job competence profile without participation of the vocational practice. This (vocational) competence profile has been used during the (re)design of the curriculum.	There is put together a job competence profile with participation of the vocational practice and this profile is fixed for a longer period of time. This job competence profile has been used during the (re)design of the curriculum.	There is put together a job competence profile with participation of the vocational practice and this profile is tuned frequently with the regional and local vocational practice including the major trends. This job competence profile has been used during the (re)design of the

					curriculum.
2	Vocational core problems are the organising unit for (re)designing the curriculum (learning and assessment).	There are no vocational core problems specified.	There are vocational core problems specified, which are used as examples in the (re)design of the curriculum	There are vocational core problems specified. These core problems are the basis for the (re)design of the some parts of the curriculum.	There are vocational core problems specified and these are leading for the (re)design of the whole curriculum.
3	Competence-development of students is assessed frequently (before, during and after the learning process).	Assessment is the final stage of a learning process and takes place at a fixed moment.	Assessment takes place at several moments. Assessment is used for formal assessment and does not play a role in the learning process of students.	Assessment takes place before, during and after the learning process. Assessment is used for both formal assessment and competence development of students.	Assessment takes place before, during and after the learning process. Assessment is used both for formal assessment and competence development of students. Students determine moment and format of assessment themselves.
4	Learning activities take place in several authentic situations.	Learning in practice is of subordinate importance and there is no relation with learning in school.	Learning in school is leading. Sometimes, in the form of cases a relation is set up with learning in practice or experiences from practice.	Learning activities take to a large extent place in authentic settings, but the relation with learning in school is insufficiently.	Learning activities take to a large extent place in a diversity of authentic settings and the learning activities are clearly related with the learning activities in practice.
5	In learning and assessment processes, knowledge, skills and attitudes are integrated.	Knowledge, skills and attitudes are separately developed and acknowledged.	Knowledge, skills and attitudes are sometimes integrated in the learning process. Knowledge, skills and attitudes are assessed separately.	Knowledge, skills and attitudes are integrated in the learning process or in the assessment procedure, not in both processes in the same time.	Integration of knowledge, skills and attitudes is for both learning and assessment processes starting point and therefore operationalised.
6	Self-responsibility and (self)-reflection of students are stimulated.	Learning activities are characterised by external steering: students carry out assignments by means of elaborated instructions. There is no (self)reflection.	In a limited part of the learning activities, students determined the way of learning themselves. There is hardly any reflection on the learning process and functioning in vocational settings.	Students determined themselves the way of learning, and time and place of learning, based on the reflection on the learning process and functioning in vocational settings.	The student is after all responsible for its own learning process on the base of its own learning needs.
7	Teachers both in school and practice fulfil their role as coach and expert in balance.	There is no question of support. Knowledge transfer is central issue in the learning process.	To a limited extent the responsibility for the learning processes is handed to the students. The teacher is directive in his or her way of supporting.	The students enjoy to a certain level to determine their own way of learning. the teacher observes when the students needs support and offers his or her support.	The teachers stimulates the student to formulate learning needs and on the base of self reflection to determine his or her own learning process
8	A basis is realised for a lifelong learning attitude for students.	There is no attention for competencies that are related to learning or (labor) identity development.	In the curriculum there is attention for competencies that are related to learning and (labor)identity , but these competencies are not integrated in the learning process.	During learning trajectories competencies related to learning and (labor)identity development are clearly related to vocational core problems and attention is paid to those competencies to a large extent.	During learning trajectories competencies related to learning and (labor)identity development are integrated and reflection on the future career of the students has taken place.

Case studies

In order to analyse and explore the conceptual framework for competence-based learning in the context of educational practice, three case studies were conducted. The three schools developed and implemented competence-based learning separately from each other. The three cases are described on the basis of the following indicators: The composition of the group that was responsible for the development, time span of the realisation, clearness of the project plan and clearness of the desired final situation. These aspects describe the develop processes in the institutions. Related to these processes the value, the applicability and the recognisability of the conceptual framework is determined.

Case A – Institution for junior secondary vocational education

Three years ago Institution A started with the developments towards competence-based education. The management of the school initiated the development towards competence-based education because of dissatisfaction with the old educational system. Students were not motivated to learn and too many students did not graduate. On the basis of a purely theoretical concept a team of three teachers started to work on a curriculum based on competencies. The pure theoretical concept has as starting point that all the learning activities have to be connected with realistic assignments from practice. The teachers had to define the steps that had to be taken to realize a new curriculum. There was no project plan and hardly any external support. The teachers took one year to think about the concept and to translate it to practice. After one year they started with one group of 30 students with the new concept. During this year a lot of problems and uncertainties had to be solved. In this first year the amount of teachers involved in the project increased to ten. The students were in general enthusiastic. Some students (or the parents of those students) decided to change over to a more traditional educational program. After this first year, two classes started working on the basis of the same concept. Problems and uncertainties are solved by the whole team. Together they think of possible solutions. The translation of the concept to practice is still developing. The team does not know when they are finished, because there is a lack of a clear final picture.

Teachers in this case are working hard to realize a stable situation in their institution. They are teaching and developing in the same time. Because of the time constraints there was hardly any time for reflection. With the help of the conceptual framework they realized what progress they had made in the last years and they could define priorities for the future.

Case B – Institution for senior secondary vocational education

Five years ago one person in Institution B started with thinking about a new concept for the education. This person developed his own vision and translated this vision into practice. His vision is that his institution has to act as a knowledge center looking for questions in the vocational practice, so students can answer the questions and practice can benefit from the effort of the student. In this way students are prepared to work in the vocational practice. There was a clear project plan and the desirable situation was described carefully. After one year of thinking the individual person invited teachers from his institution to think along with him and to start with the implementation of the concept. They actually started that year with one class. A team of four teachers and the initiator could make use of one external consultant. This consultant is an expert in the support of growing from a teacher towards a coach. Although the team thought about a lot of aspects in practice there still were problems and uncertainties that had to be solved. After two years the first initiator stopped with working on the concept and handed over the responsibility to the team. The team worked on it and extended the amount of classes. All the students are very enthusiastic about this way of learning. In the last years the amount of classes extended to ten classes. The team of teachers extended as well. Although the

team had the availability of a clear picture of a desirable situation, the team is still improving the concept on the base of their experiences.

In this institution the conceptual framework is used to make clear to the outside world what kind of education this institution is providing. The vision of the initiator was hardly founded by theories and primarily based on his own ideas and experiences. The conceptual framework appeared for the teachers in this institution a framework that helped them to account for their educational program.

Case C – Institution for higher vocational education

Institution C started four years ago with the developments of competence-based education for a new educational program. The team of four teachers was responsible for a new educational program for agricultural entrepreneur. From the start of the developments it was clear that this program should be based on competencies, because for this specific program the vocational context is very clear and working with competencies guarantees that this practice is used in the educational practice. However there was neither a clear picture what was meant by competence-based education, nor a clear picture what competence-based education meant for the educational practice. The team started to develop this program with the help of several external experts. Together they tried to define their own picture of competence-based education. After one and a half year of thinking and developing the first students started with the program. On the base of these first experiences a lot of things are adjusted and changed. In general the students are satisfied with their education and they say they learn more than in more traditional educational systems.

In this case the conceptual framework for competence-based education is used to get an overview over the situation at a certain moment. Besides other educational programs within the institution could also get an overview over the educational program for agricultural entrepreneur. Other program could take their advantage of the former experiences.

Conclusion and discussion

The study was conducted with two main objectives. The first objective was to realise a conceptual framework for competence-based VET. All participants who returned third rounds' questionnaire fully agreed on the current conceptual framework, so the Delphi study is finished with a thorough validated conceptual framework. Although not all participants were able to keep commitment to the end of the Delphi study, the first objective of this study can be considered as attained; a considered conceptual framework for competence-based is realized.

Although the conceptual framework is constructed by a group of experts that does not mean obviously that the practice considers the conceptual framework as useful. Therefore the second part of this study is conducted to determine the value, the applicability and the recognisability of the conceptual framework, developed in the first part of this study. A first attempt to validate the applicability of the conceptual framework in practice is conducted. The framework is tested in three VET institutions. The three schools developed and implemented competence-based learning separately from each other. The processes the different teams went through differ on certain points. The results of these activities are described and analyzed. In general the conclusion can be drawn that for all three institutions using the framework had several advantages.

Considering the second goal of this study the following observations have been done. Firstly, the development teams recognised their situation in the conceptual framework. It took in some cases more discussion than in other but the teams could determine in which phase the implementation of competence-based learning in their institution is situated. Secondly, the teams could identify which aspects of the current situation should be improved. Finally, the conceptual framework made it possible to formulate a concrete plan for the developments in the near future to improve

education. These conclusions, although primarily because of the limited number of case studies, show firstly that the content of the conceptual framework is relevant for the educational practice and the teams understand the content of the conceptual framework. Although the teams use their own vocabulary they can connect their words to the words used in the conceptual framework. Moreover it supports the members of a team to specify the picture they have with several words and concepts they use in their own situations. The first attempt to validate the content of the conceptual framework is successful. Secondly, the teams recognise themselves in the conceptual framework. They are able to verify their own situation in the framework of the phases of the conceptual framework. Moreover they can identify which phase is desirable for the (near) future. The teams recognise their situation in the conceptual framework and the framework supports them to improve their own situation. On the base of the former conclusions the final conclusion can be drawn. The framework is applicable in the situations of the three institutions. All the three institutions apply the conceptual framework for different reasons, but they have clearly a benefit of using the conceptual framework.

Although the conceptual framework is validated in practice, this validation process has to be extended. Three cases can give a certain picture but more cases are necessary to give a reliable answer to the second goal of this paper. In following studies this question will be answered more thoroughly.

Some final remarks

In the Netherlands, and the assumption is that it would not be different in other countries, the developments around new learning knows her advocates and opponents. In the introduction of this paper, the expectation is emphasised that competence-based learning can decrease the transition problems for students who are transferring from school to work. Research has to make clear to what extent students who are educated on the basis of competencies or new ways of learning are performing better in vocational practice than students who are educated in a more traditional way. Advocates say they do. Opponents say they don't. Considering this discussion it is important to prove the added value of competence-based education. However the popularity of the concept of competence-based VET has resulted in the situation that many institutions claim to have a competence-based curriculum. However, when one takes a closer look, in many institutions only superficial changes in the curriculum have taken place, and learning processes did not change. Therefore an instrument should be available to distinguish between VET institutions that do provide a competence-based study program and institutions that apparently say they do, but in practice still provide a more traditional study program. In this study first steps are taken to realise such an instrument. In the coming future the conceptual framework will be tested in more institutions for VET with the aim to realise a reliable instrument.

The conceptual framework developed and explored in this study only concerns the educational processes in a school. In the case of realising competence-based learning the whole organisation has to change. Further research has to make clear what the implementation of competence-based learning means for the organisation of an institution for VET. Mulder (2003) already indicated that although competence-based learning is a promising development, it is a rather complex development, which needs all developers' collective intelligence to make it to a success.

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