The new competence concept in higher education: error or enrichment?

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Introduction

There has been a strong competence movement in education in the US in the seventies of the last centuries (Grant et al, 1979). This was followed by the application of the concept in the design of vocational-technical education. In a study of the US Department of Education (2002) competency-based initiatives were evaluated. The concept of competence is also used frequently in corporate education. Currently, there is much attention for the concept of competence in the EU, both in vocational-technical and in higher education. Various EU member states have their national competence frameworks already, developed at national (like Ireland, France and the Netherlands) or state level (like the UK, Germany, Belgium), including the same kind of actors that are mentioned at EU level. Like in the US, there is also much attention for competence development for employee management in public and private organizations in the EU (Mulder & Collins, 2006).

The objective of the study is to evaluate the question as to whether the new concept of competence is used and fruitful for higher education by linking university practices and experiences to the identified issues.

Perspectives and theoretical framework

The concept of competence can be dated back to Persian (in the code of Hamurabbi), Greek (in Lydia of Plato) and Roman times (in general language), is used in Europe from the 16th century and entered professional literature in law (competence of courts and witnesses), public administration (competence of institutions), organizational structure (competence of departments or functions), management (core competence, competence management), and education and training (competence-based education) from the seventies of the last century (Mulder, 2007).

The debate about the concept started in the fifties of the last century, when White (1959) wrote a piece in which he defined competence as a basic motive for the acquisition of knowledge, mastery of skills, need for exploration, or competence as exploratory learning for 'effectance'. McClelland (1973) more than a decade later stated that traditional testing needed to be changed, as the prognostic validity of IQ testing and traditional assessments in education, training and selection of professionals was limited. Gilbert (1978) made a link between competence and effective performance improvement. Boyatzis (1982) did large scale studies on competence of managers, identifying top performing managers to define their competencies. Zemke (1982) expanded the application of the concept of competence to all training and development. By this time professional associations began to use competency profiles for professional licensure and registration practices. McLagan (1983) developed competence profiles for self assessment and development. The competency framework for managers of Quinn et al (1996) showed that it is important to think in collective competence of teams, and that team members can or even should have different competencies. Prahalad & Hamel (1990) applied the concept of core competence at organizational level. They contended that organisations which identified and employed their core competence in strategic development showed better performance.

In the 1990s, the concept of competence also became popular in European education (European Commission, 2005; 2006; European Social Partners, 2006). Studies of Biemans et al (2004), and Mulder et al (2006) showed the various difficulties surrounding the implementation of competence-based education in various countries.

In this contribution competence is seen as a series of: integrated capabilities, consisting of clusters of knowledge, skills, and attitudes, necessarily conditional for task performance and problem solving, and for being able to function effectively in a certain profession, organization, job, role and situation.

Based on various theories of education and empirical research eight principles of competence-based vocational education were developed for the empowerment of local education teams to facilitate interactive processes of curriculum deliberation (Wesselink, Mulder & Biemans, 2007). These principles were included in a matrix which was meant as instrument for program teams.

Furthermore, the study takes full account of the many criticisms regarding the old competency-based initiatives, and the more recent competence-based developments (Biemans et al, 2004; Mulder, Weigel & Collins, 2007; Weigel, Mulder & Collins, 2007).

The most fundamental criticism regarding competence-based education comes for higher education, especially from the liberal education tradition. Hyland (2006) for instance, sees competence based education as a form of reductionist behaviourism. It is not clear whether he refers to the older conceptualisations of the concept or to the newer more holistic ones, which stress the broad development of the full potential of students. Anyway, it is good to review the perceptions of higher education faculty, in particular full university professors, also in the natural sciences, to see whether the criticism against competence-based higher education indeed is as strong as some critics suggest. Together with that, it is good to have a picture of the opinions of other stakeholders in higher, especially university education.

Our research question then is: how do university professors and other stakeholders in university education programs evaluate the competence-based education philosophy which is widely being implemented in education? Do they indeed share the serious critiques, or do they see valued added of this educational philosophy?

Methods and techniques of inquiry

An exploration of competence-based educational initiatives in Dutch Universities was conducted and individual interviews were held with full professors of eight universities in The Netherlands. These interviews focused on their perceptions and opinions about the value and usefulness of the competence concept and competence-based education for higher education.

In addition, one university was selected for a broader inventory of the perceptions of different stakeholders concerning this issue. The selected university a Dutch University and Research Centre, which comprises both academic and professional education programs. The distinction between the two is based on the Dutch binary system of higher education, which consists of academic and professional programs.

The mode of inquiry is a qualitative case study, using various stakeholders to evaluate the appropriateness of the concept of competence-based education university (academic) education. Some trajectories of academic education in the Netherlands however also prepare students for practical professions, such as the medical, judicial of construction professions. The use of competence-based principles in these trajectories seems easier and is more often used. It is however rare to see the use of competence development notions in science-oriented Bachelor and Master programs, such as physics, mathematics, biology of chemistry. Therefore we identified various programs in these fields to collect information about the integration of the notion of competence in their programs.

The stakeholders of the case study are: the board of the university, the directorate of education and research, the directorate of the educational institute of the university (under which all bachelor and master programs fall), program directors, program field committees, study organizations (student associations for professional development), and other relevant student organizations. As said, various other program directors of especially science-oriented programs were contacted for information.

Data sources

Various data collection techniques were used:

- Eight universities in the Netherlands were selected who were consulted some years ago about the same topic. Education Directors of Master programs in the field of the hard sciences were consulted and invited to describe the developments in their program (such as chemistry) or field (such as hard sciences) regarding the implementation of the competence-based teaching philosophy.
- Full professors of one university were also invited to share their vision about the competence-based education philosophy and to give their opinion about the value of this concept for their programs and courses; eighteen of these professors reacted to this

invitation, and the fields they represented were quite diverse, ranging from social sciences, to hard sciences.

- Within this university data was collected during a participatory process (of six meetings) in a project with the administration of the university, the director of education and research policy, the director of the educational institute, the alumni bureau, a student representative and two representatives of the chair group of Education and Competence Studies.

- Furthermore, in this university program directors were consulted about the working field committees.

- Around fifteen education commissioners (chair persons for education affairs) of study associations (these are professional associations of students around their programs which organize excursions, conferences, study days, workshops, and training programs; they should not be mixed with student organizations with either a political or social purpose) invited for focus groups, in which they provided in-depth views about competence development and preparation for the labour market of students in academic education.

In all cases, the texts of the responses and contributions of the persons and groups involved were analysed in a hermeneutic way, to profoundly get their meaning. Several categories of analysis were used to structure the views of the persons involved.

It was decided to use the following topics to aggregate the views of the various research sub groups, as these topics appear to be the major categories on which criticism on competence-based education concentrate: the definition of the concept of competence, the knowledge component which may get too little attention, the curriculum which should or should not be aligned with needs articulated by the labour market and profession, instruction and assessment.

Results

As said, the results section will be structured along several identified critical issues in competence-based education (e.g., Biemans et al. 2004; Mulder, Gulikers & Biemans, 2008; Wesselink, 2007). Identified issues are: the definition of the concept, the old and new use of the concept, the place of knowledge within competence-based education, the way in which the competence development philosophy is integrated in the curriculum, the consequences for instructional strategies, and the development and pitfalls of competence assessments. Results of identified university practices and stakeholder perceptions will be directly linked to these issues. From this discussion, principles can be derived which are important for further

development of competence-based education. In the conclusion section these principles will be summarized.

Competence and *definition*

There is a multitude of definitions of the concept of competence both internationally as well as within the Netherlands and at various levels of education (Biemans et al, 2004) and there is much debate about the conceptualization of it. In Western Europe the general definition used for instance by the European Union in the various policy documents on the European Qualification Structure and the European Credit Transfer System for Vocational Education and Training, is found to be too broad, abstract and general. In the United Kingdom however, the concept is experienced as being to narrow and outcome-oriented (Weigel, Mulder & Collins, 2006; Mulder, Weigel & Collins, 2006).

That defining the concept is a hurdle, also appears from the reactions of various academic programs:

> *'Thinking … (about competence-based education) is relatively broadly disseminated, although the actual implementation is not always very clear; one can spend days discussing what a competence is or not: you don't want to do that' (university professor)'.*

When competence-based education would be purely defined as the development of specific occupational skills, this would not contribute to the education of creative researchers. This is the foundation of many critiques are given about this definition.

Competence-based education instead should be aimed at the development of balanced, useful and ethical contribution of alumni towards society. Together with that, the universities and colleges should retain the cultural heritage, knowledge-for-knowledge, philosophy and reflection. Some also mention the importance of developing attitudes in education. Others however make the remark that when attitude is beginning to play a role in the definition, it possibly becomes a useless container concept.

The concept of competence in academic education – *old wine in new bottles?*

An often occurring prejudice about the competence development philosophy within academic education is that this is not really an innovation, but old wine in new bottles. During the seventies and eighties of last century competence-based curriculum practices existed in higher education within the US, and experiences of many undergraduate and graduate

students was that it did not really add to their professional development. Competence lists were too detailed and competencies were too fragmented.

But if competence is perceived as capability, the universities and academies have since their inception contributed to the development of competence of their students, for it has always been the purpose of these institutions to educate students to be able to fulfil a role in society. During the course of the centuries university education however has become over specialized and fragmented. Specialized knowledge became most important.

New in the competence-based education approaches however is the explicit use of, it and the institutionalized use of competence-instruments like core competence models, competence profiles, course-competence matrices and competence assessments. Competences now play a role in academic education in various places around the world, both in an inside-out and outside-in mode. Inside-out use of competence instruments takes place in accountability and accreditation processes. Outside-in approaches are being followed in aligning learning lines and trajectories of the student, regarding learning objectives, course content, educational organization and assessment of student achievement, to outcomes required at the labor market

Knowledge and competence

Another prejudice about competence-based education is that competence could replace knowledge. Some warn for overemphasizing skills training. This concern is being expressed in the European context (Mulder & Weigel, 2006) and in vocational education (Biemans, 2004). From the reactions from the universities it appeared that respondents were divided about the question as to whether competence-based education goes at the expense of knowledge acquisition.

Some respondents believe that by implementing competence-based education the level of academic thinking will decrease. They fear a shift of attention of knowledge development and scientific creativity towards skills development. Competence development and knowledge development are thus being juxtaposed as competing educational philosophies.

> *'For (future) PhD students scientific knowledge is of very great importance … for them competence-based education is not appropriate' (university professor).*

That this opinion is held broader in society is also apparent from the remark of an educational director:

> *'... I ... still have to constantly explain that employing the conceptual framework of competence domains does not imply that we have surrendered to criteria and standards for higher vocational education'.*

Furthermore, it is stated that the decreasing level of disciplinary basic knowledge of students within certain fields necessitates that more attention is needed for analytical and mathematical skills than for other occupational oriented competences.

Apart from the group who state that competence-based education stands in the way of content oriented education, another group believes that competence-based education can also support content-related academic development.

> *'It is possible that by using the competence-based educational philosophy students acquire a better way of studying which also contributes to the purely content-related development' (university professor).*

Knowledge development and competence-based education do not have to be opposing one another therefore.

> *'The acquisition of knowledge and insight and the application of knowledge are also important competences' (university professor).*

We contend that knowledge (from possessing to evaluating it) remains important, although in the current information and knowledge society academic and professional skills also get increasingly important. About the non-knowledge oriented competences is stated that they need a clear place in educational programs, but they should not get too much emphasis.
 Important (academic) skills which have been mentioned by several stakeholder groups are for instance seeking information, critical reading and judging information, summarizing, writing a report of article, and presenting. Others do not want the stress these skills to much, but would want to focus on competences like being able to apply systems thinking, and analyzing complex problems. A scientifically and societal open but critical attitude is perceived of as being very important.

Students of Wageningen University collectively stressed that nothing was wrong with their knowledge development. They also stressed that this is and should remain a crucial part of academic education. However, they felt they lacked educational programs and especially feedback on more generic academic competences like communicating (written and oral), giving and providing feedback, networking, collaborating in a team and more of the like.

> *"when you get in contact with the work field, often not until the final part of your masters program, you experience that these generic skills are crucial at the work*

> *field. I think that the university should at least make us more aware of the importance*
> *of these competencies and should offer us opportunities to develop them or gain*
> *feedback on them" (student representative).*

Students argued that developing these kinds of competences does not only have to be the responsibility of the university.

Competence and the *curriculum*

To translate the competence oriented education philosophy to the curriculum, competence profiles are being composed. These profiles describe competences which are often supplemented with different levels of mastery (e.g., Bsc, MSc, PhD level).

A way to get to a competence profile is to start with job roles and to define outputs and consequently competences for those roles. An occupation for which a student is being prepared often consists of more roles (such as research, design and consultancy). These roles are described after which outputs are being formulated. These are services and products such as analytical reports, research instruments, test results, articles, presentation and instructions. Finally, on the basis of this, competences can be defined. These are capabilities role holders need to have to be able to realise the relevant outputs.

Competences can be formulated at general level, but also at very specific level. While formulating competences in university education, over-generalization and over-specialization should both be avoided.

Several professors in different trajectories agreed that also university programs need to comply with the needs of society, however, these aspects should be made more transparent and explicit in accreditation processes.

A comparable approach can be found in the Joint Statement of the UK Research Councils' Training Requirements for Research Students. Another approach, of developing competence profiles, can be found in the Dutch Biology programs. In these programs, competencies are being divided into knowledge competences (5), skill competences (8) and attitude competences (3-4).

Within the educational institute of Chemistry at one of the universities, faculty in the context of competence-based education speak about academic skills, which are allocated in three learning lines in the Bachelor program: Communication (writing/presenting); doing research; context (philosophy of science and ethics).

The Open University uses an approach which is aimed at identifying critical job tasks, which in turn are translated into a range of study tasks and assessments tasks focusing on

performing this critical job task as a whole, but from a simple to a complex level. In this approach, competence-based education and assessment are directly integrated.

> *'The starting point is that good education rests upon an explicit educational design in which the consequences for the educational exploitation (financing) is also considered' (university professor).*

A reaction from a university professor who has been busy with the development of competence profiles is that it was an eye-opener, because before faculty used to define knowledge items as educational objectives. However, a critical remark here is that the expectations about elaboration and measurability of competences may appear to be too high:

> *'It is still about objectives which take shape and change while working' (university professor).*

The reactions of the universities in this study showed that faculties are still searching for ways in which competences can be integrated in the curricula of the programs. Some universities are not working with competences at all, or are only trying to work with the Dublin descriptors, while others have developed extensive competence models, frameworks or profiles. Concretely implementing them in the curriculum is still a big experiment. An issue that seems to hamper this process is the different understandings and interpretations that stakeholders within one university or even within one teacher team have about what competence is and how this should be used in university education..

Some also have the experience that they unconsciously go to far in the development process:

> *'You want to achieve […] a bit too many things […] which in fact not all students need to master, but with which they should be acquainted' (university professor)*
>
> *'... then you get a whole paper circus, of which many feel that this is not feasible and thus adds little to directing the programs in the right way' (university professor).*

This again shows a big difference between the paper competences and the real competences which are being developed during the program, in which again the different interpretations interfere. This goes along with warnings against the bureaucratic use of competence instruments in academic education. A professor of Wageningen university stated it is useful to define the competences within the educational programs at general level, but that it has become a cult with all kind of forms that need to be completed in a very detailed way.

> *'Of course, diverse academic skills and competences are addressed in various courses, in a natural way. Use that and do not add skills in an artificial way to courses. That does not work, and furthermore it goes at the expense of the content-related part of the course' (university professor).*

Students reported that implicitly many skills or competencies were already present in their courses. For example, they have to give a presentation about their work to other students or even to representatives of the work field. However, there is no explicit attention and feedback on the presentation skills, but only on content-related issues.

> *'I can imagine that the teacher or peer students use feedback forms for evaluating not the content, but my presentation skills'*

Moreover, some students would appreciate short introductory courses about important competencies. For example about how do you give feedback, what is important to realize when you are networking, or how do you present your work.

Competence and *instruction*

Competence-based education often goes together with the implementation of principles of activating student learning. According to those principles students are expected to collect information by themselves and to solve problems in groups. This changes the role of the teacher and that of the student. Competence-based education is more student-centred and less teacher-directed (Wesselink et al., 2007). The experience is that teachers give less and less information and instruction to students. In line with previous sections, many fear that the level of mastery of basic skills and knowledge is decreasing as a result of this approach (Weigel & Mulder, 2006).

Biemans et al (2004) describe the experiences in vocational education and show that the changing role of teachers and students can easily be overlooked. It is therefore seen as important that structural attention is being paid to the competence development of teachers and education managers.

Learning in practice is formulated as condition for competence-based education (Wesselink et al., 2007), but in reality it appears to be problematic to combine learning with practice. For example, problem-based education (PBE) is an instructional method used in higher education to initiate learning through practical problem cases that students have to solve in groups. A remark frequently made about PBE as educational method is that the group work which is involved is not always appreciated. Students currently also want to perform and excel individually, and they do not always divide the work in a fair way. Many times there are students who try to take a free ride with the consequence that that the total quality of the group work decreases.

A countervailing remark of one of the respondents in the study was that learning to work in groups is a crucial competence for professional practice, also in many academic fields of work, and should thus be practiced during education:

> *'Academic learning in the exact sciences is often perceived as an individual activity, whereas the work of a researcher in a research group is often characterized as teamwork. That also has to be learned during the study' (university professor).*

Studies on PBE also found that PBE can positively influence other competences such as being able to work interdisciplinary, being able to apply field specific knowledge and methods, being able to plan, coordinate and organize, the problem solving capacity, and reflective skills (Vaatstra & De Vries, 2007), without jeopardizing the knowledge level and retention of knowledge (Schmidt, Vermeulen, & Van der Molen, 2006)

However, the implementation of these new instructional methods requires good and clear instruction to really reach the positive effects and to prevent gaps in the knowledge base of students. Transferring responsibility from the teacher to the students is experienced as problematic in many vocational education and training trajectories and the stakeholders in this study stress that this also requires specific attention in higher education. In many cases educational designers and teachers expect too much of students regarding knowledge construction by themselves via internet and the literature.

> *'A general complaint of students in the beginning of the program is that they find PBE too vague and that they cannot judge by themselves what is good and wrong (and also get too little feedback of the teachers about that), so that they are not fully sure about their views and ideas and what they should or should not know' (university professor)*

PBE is being mentioned often within the context of the competence-based development philosophy in universities to indicate that it is not useful to exclusively design and implement competence-based education. Some institutions have gone to far in that respect during the last decade.

> *'Innovations in education are necessary, but they should be introduced carefully'(university professor).*

Students plead for a stronger involvement of people from the work field in their educational trajectories. For example through guest-lectures in which business people talk about what they really expect from their employees or what kind of tasks are representative of their field. Again, they see a mutual responsibility for the university and the students themselves or student organization to undertake activities to relate learning and working.

Competence and *assessment*

In the literature and by the respondents various critical remarks are being made while using competence assessments. Biemans et al (2004) and Mulder, Weigel & Collins (2006) identified the following challenges in this respect: competence-assessment costs much time; competence-assessment goes with high costs; the development of competences takes long, because of which it is difficult to test them during the educational program; competences are being formulated in general terms, so that they do not have any discriminating power in assessments; the assessment of performance of persons frequently takes place in simulated professional contexts, by which there is no guarantee that the same person will also act competently in a real professional context; and analysts of profiles of competences do not always have the availability of sufficient capability and trustworthiness to judge whether certain persons are competent or not.

The reactions of the Dutch universities confirm that time and costs of assessments are an obstacle for implementation. The Theology program of one of the universities went a step back after a pilot project with portfolios because of the time that was needed to invest in it. Others limit extensively documented feedback, '(…) to not increase the administrative burden of faculty too much'.

But a competence-based curriculum requires a competence-based assessment, because a misalignment of these two is detrimental for learning (Gulikers, Kester, Kirschner, & Bastiaens, 2008). Competences are being described in a profile, included in courses via innovative educational methods and subsequently students need to be assessed to determine whether they sufficiently achieved the required competences, also called summative assessments or assessment *of* learning. In competence-based education, more emphasis is also being placed on formative assessments, that is, assessments *for* learning (Birenbaum et al., 2006). There are various testing or assessment methods for self-assessment, assessment by independent assessors or 360-degrees feedback that can be used for summative and formative purposes. In vocational education and the business world, developing a personal development plan (PDP) gains more field. This can be used to give students or employees information about the mastery of the competences in the curriculum. In the PDP agreements can be registered about the priorities of the competences to develop, and the strategies to realize that, such as training, workplace learning, coaching, and intervision.

Many university institutions currently are in the phase of developing assessment standards and procedures. Some have gone through a pilot stage, others still have to think about the way in which they will make the competences they defined testable.

Representatives of educational administration of the Wageningen University argued that the educational programs need to cover the most important competencies, and that this can be supported by competence assessment in the Bachelor programs focusing on assessing the academic skills like communication, working in a team, doing research, and in the Master programs by assessments that focus on relating the occupational preferences of the students to the possible job profiles of their educational trajectory (i.e., researcher, policy maker, consultant, etc.).

Student organizations were in general very interested in the topic of competence-based assessment, especially for a developmental (formative) purpose. Assessing competences for summative purposes (i.e., did the student reach a pre-defined required level) should not be the initial purpose according to students. However, students did stress the need to gain feedback on their competence development and discuss this with professionals (i.e., teachers or others), in order to make decisions for future educational or professional plans. Having only assessments or a portfolio which is not followed up by a discussion about 'what does this mean for me and for my future development' would not be satisfying in the eyes of the students.

Conclusions and recommendations

Based on the information which was given by the contact persons in the study, it can be concluded that academic higher education can make effective use of the concept of competence. However, knowledge is the largest part of the competence of a university graduate, and therefore knowledge remains the largest part of the curriculum. Course-competence matrices can help to identify the competence-oriented learning trajectories. The perceptions and preferences of full professors regarding the use of competence development in academic education varies from critical to supportive; others point to the mere fact that the programs must comply with the needs of society (which should be made transparent in accreditation processes). It is not like all university professors strongly reject the practice of competence-based education. On the contrary, various professors were positive about the need to prepare students for the labour market and a career. They saw competence development as a productive way to prepare students for working life.

There are many differences in the extent to which universities are working with competence-based education and how they operationalise this.

The case study showed that representatives of educational administration have a general feeling that the educational programs need to cover the most important competencies, and that this can be supported by assessing the academic skills in the Bachelor programs, and by assessing the occupational preferences of students in the Master programs, both to help them choose and develop better.

Representatives of student organisations value the notion of competence development and preparation for the labour market. They would like to see relationships between what they and the academic programs do in terms of competence development (such as to develop a personal portfolio – digital or not – and personal development plans). According to the organisations, competence should be integrated in the academic programs, but for various skills, special time should be reserved for specific teaching and learning of these skills, such as communication, critical reflection, information literacy, teamwork, project management skills.

Most universities in this study are active with the introduction and implementation of a competence-oriented educational philosophy.

Practically speaking, the implementation of the competence-oriented development philosophy goes with various challenges, such as time investment, costs and the changing organization or education. During the design of the competence profiles developers can loose their clear sight on practice. A consequence can be that the competence profiles do not serve as a practical tool for development, but a paper exercise.

Further research should be started to show differential relationships between the level of integration of the competence concept in higher education and the societal effects of the respective programs.

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