Competence-Based Education and Training– about Frequently Asked Questions

This contribution to the JAEE follows my previous piece on practical guidelines for the development of comprehensive competence-based education and training (Mulder, 2012). It is about the questions that have been and still are frequently asked in presentations, workshops and classes about the introduction of competence-based education. The answers to these questions can be long and theoretical, but in this piece I attempt to make the answers as concise and practical as possible. The questions are the following:

1. Why competence-based education?
2. What is competence-based education?
3. How is competence-based education related to outcome-based education?
4. What are the principles of competence-based education?
5. What promise does competence-based education have for developing countries?
6. Is competence-based education possible in universities with limited resources?
7. What strategies can be used for competence-based curriculum development?
8. How to go from the competence-based curriculum to lesson plans and active student-centred learning?

1. Why competence-based education?

The main reason for competence-based education is the alignment with needs in society, a sector, a region, a community, or a company. It intends to give graduates access to the world of work. It also wants to enable them to have added value for the economy, and to ensure them a good livelihood in terms of self-employment, employment in commercial farms, processing companies, ngo's, governmental agencies or international donor organisations, or as independent entrepreneurs. The competence-based education movement is a reaction on education programs that are obsolete and irrelevant for socio-economic development.

2. What is competence-based education?

Competence development is a key educational philosophy. Competence is the core concept in this philosophy. What does that mean? There are many definitions of this concept circulating. In my opinion competence means the capability to perform actions which add value. A competent university graduate is able to perform effectively in his or her profession. That performance is not only about knowledge, but also about skills and attitudes. Let me give two examples. First one from the field of crime: picture a crime scene investigation, in which an laboratory assistant has to make a DNA profile of a piece of evidence. The assistant needs to have the appropriate knowledge to do this, but also the necessary skills to handle the equipment and the evidence to not damage traces with the DNA material. The assistant also

needs to do this with the right attitude (such as integrity, accuracy and the ability to do the job under pressure), since a lot is at stake. The results may be decisive in a verdict and lead to a serious sentence.

Or let us take another example, of entrepreneurs in horticulture. When commercial growers are going to take an important decision about an investment to enlarge the farm, or to buy an expensive but more sustainable fertigation system, they need knowledge about these innovations. But not only that, they also need the skills to effectively communicate their ideas with their partners, investors, experts or consultants. And they also need to do this with the right attitude. They need to convince their partners that the investment is worth the risk, and they have to choose the right timing. For innovations to become profitable, entrepreneurs have to utilise opportunities at the right moment, not too early, but also not too late.

There are many lists of competencies, and there is a lot of research behind them (see for instance the great eight of Bartram, 2004). Basically there are the competencies which are behaviour-oriented (such as interaction competence, stress management, independency, self-management) and task-oriented (such as being able to supervise a greenhouse, integrated pest management, manage a flower farm, etcetera). Both types of competencies are important to improve in my opinion. Examples of behaviour-oriented competencies can be found in the work of Bartram (op cit) and of task-oriented competencies in the Canadian competence-model of the medical profession (The Royal College of Physicians and Surgeons of Canada, 2005). Examples of combined approaches can be found in the work of Mulder et al (2005), Karbasioun et al (2007), Brinkman et al (2007), Du Chatenier (2009), Lans (2009), Oonk et al (2011) and Wesselink and Wals (2011).

3. How is competence-based education related to outcome-based education?

The needs of sectors (such as horticulture and floriculture), and occupations (such as researchers, managers and supervisors) are important inputs for the curriculum making process. Jobs are being analysed, tasks are being reviewed and the question then is, what students need to be capable of to be effective in jobs and to be able to perform the essential tasks and solve rising problems.

It is different from the traditional input-driven educational development. In that kind of educational development teachers and experts determined the content of the curriculum by their own. There was a strong unilaterally science-driven approach. That led to overloaded and very often irrelevant programs. The teacher and the subject matter was the centre of the education process. Graduates knew a lot, but could not always apply their knowledge in practice. And this application of knowledge is essential if we want to bring about change and development. It is as the motto of the 2012 Annual Meeting of the American Educational Research Education: Non Satis Scire – To Know Is Not Enough. Although that conference theme related to the notion that educational research should not only try to understand educational issues, but also serve the public good with the knowledge that has been collected, the analogy is obvious: education itself should not only provide knowledge, it should also serve the public good, in that students will be educated so that they can make a contribution to society and to socio-economic development.

In my opinion, in this way, competence-based education is a variety of outcome-based education: outcomes that are relevant for socio-economic development are leading. So teaching students the necessary knowledge is not enough, they also need to learn to apply this knowledge in specific working situations. To enable this, more practice-oriented learning is

needed, which takes place within colleges and universities, but which should also take place in internships, field trips, practicals, and the like.

4. What are the principles of competence-based education?

In my already mentioned previous contribution to the JAEE on practical guidelines for the development of competence-based education and training, I have distinguished eight principles which characterize good competence-based education. These principles have been further validated and elaborated by Sturing et al (2012). This resulted in two more principles and five implementation levels (instead of four): 1. not competence based education; 2. starting to be competence-based; 3. partially competence-based; 4. largely competence-based; 5. completely competence-based. The principles, which are further reformulated here are:

1. Curricula are based on core tasks, working processes and competencies (which should be included in a National Qualification Framework).
2. Essential performance situations are the focal reference points for curriculum development.
3. Learning activities take place in different specific, meaningful vocational situations.
4. Attention is given to the integration of knowledge, skills and attitudes in the professional action repertoire of the student.
5. Students are regularly assessed (both in a formative and summative way).
6. Students are challenged to reflect on their own learning process.
7. Study programmes are structured in such a way that self-regulation of students continuously increases.
8. Study programmes are flexible.
9. Guidance is aligned to the learning needs of the students.
10. Study programmes pay attention to learning, career- and citizenship competences.

Basically we are thus distinguishing four elements of competence-based education, which all belong together:

a. The Curriculum element about what to teach and learn? What to teach and learn should be relevant.
b. The Learning and Instruction element on how to support the learning of the students. Here we need activating and argumentative teaching approaches and learner-centred education.
c. The Organisation element of the learning. This is mainly about giving students opportunities for self-responsibility and cooperation with the sector about the practical part of the program, which will enable good internship places, practicals, community-oriented projects, site visits, guest lectures, etcetera.
d. The Competence Assessment element, which needs to answer the question how good students master the core competencies of the program. The Pyramid of Miller (1990) can be used here to distinguish several levels of competence assessment.

It is essential to understand that these four elements (complemented by the educational philosophy of an educational institution or a program team – see Figure 1) of competence-based education are depending on one another. If one element is changed, it has implications for the others.
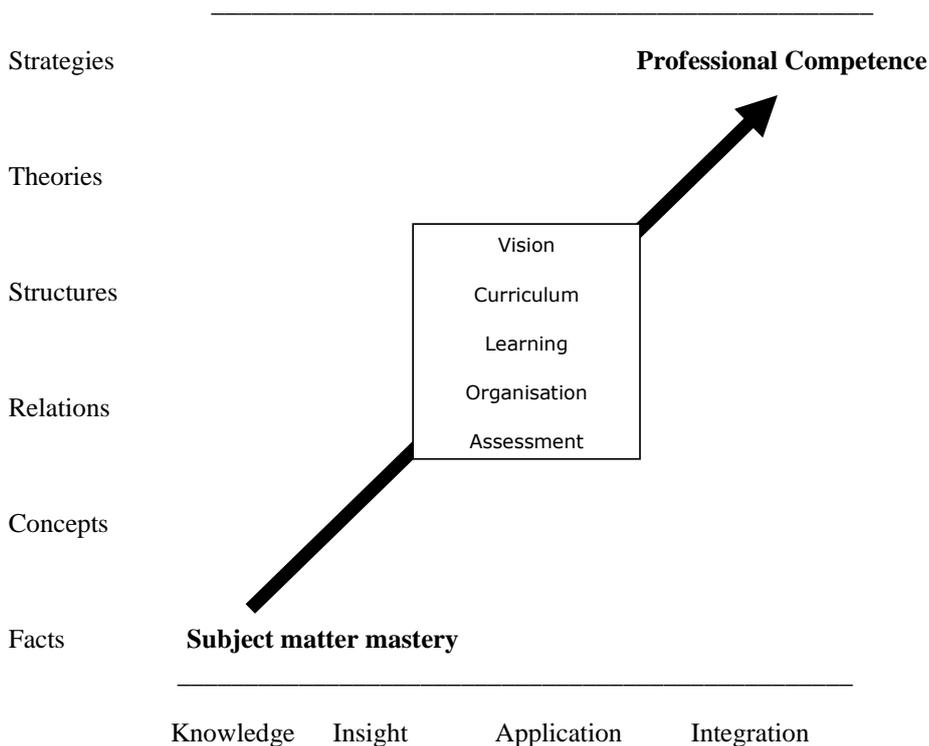
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Strategies   **Professional Competence**

Theories

Structures

	Vision
	Curriculum
	Learning
	Organisation
	Assessment

Relations

Concepts

Facts   **Subject matter mastery**

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Knowledge   Insight   Application   Integration

Figure 1.   The shift towards competence-based education (after Mulder, 2000)

5. What promise does competence-based education have for developing countries?

In my opinion the promise of competence-based education for developing countries is the same as that for other countries: a more relevant curriculum; graduates who are better prepared; professionals who are adding more value to development; and university, college and training programs which are more satisfying for students, teachers and potential employers.
The competence trail, if I may call it that way, goes around the world. There are many projects on this way of education worldwide, such as in Africa, Asia, Australia, the Southern Americas and Europe. It is not a Dutch (let alone a Wageningen) invention.

Evaluations show that various practices are being implemented behind the phrase competence-based education. That is also why we developed the principles of competence-based education, to help program teams determine the extent to which their educational program is competence-based, and what development priorities they want to set in that respect.

No educational innovation goes without criticism. This also holds for the competence-based education philosophy. Together with colleagues we have made overviews of the critiques (Mulder et al, 2007; Biemans et al, 2009). The fears are about:

1. Diminishing the scientific part of the curriculum.
2. Diminishing the number of contact hours with students.
3. Leaving students on their own.
4. Letting students solve their problems without any quality feedback.
5. Adding to the bureaucracy of education, by filling out all kinds of competence forms.
6. The costs of the innovation.
7. The lacking capacity and resources for authentic competence assessment by teachers and representatives from the world of work.

The answer to these fears in my opinion is: 'It is good to be aware of them, and it is possible to overcome them, if you pay the right attention to them'. After all, keeping the traditional kind of teaching is also no solution, since that also goes with plenty of bureaucracy, lack of quality, and dissatisfaction on the side of students, teachers, administrators, governors, politicians, employers and other stakeholders.

6. Is competence-based education possible in universities with limited resources?

This is probably the most difficult question, but I would not be too negative about it. For: resources are always limited. Of course the comparison is not completely just, but there is also a lot of dissatisfaction with the educational resources in Western societies. Many lecturers and professors in developing countries have been trained in Western countries, and have experienced elaborate facilities of various educational institutions. But also there, there are complaints about working conditions, teacher salaries, budgets for programs, and resources for innovation. So, I think that the limitation of resources is not the key problem. Instead, the key is to invent better programs and improved ways of teaching, within the given context of work, in the interest of the working generations of tomorrow, and the students of today. That does not mean that the teaching profession should not work on the improvement of the working conditions in education, it should. My point is that existing working conditions are quite often used as an excuse for an alleged impossibility of making education better.

7. What strategies can be used for competence-based curriculum development?

This in fact is an extensive question, and I can only briefly go into this. Let me give a short summary of what we have done in a project on the redesign of an MSc curriculum on horticulture with staff from the Jimma University College of Agriculture and Veterinary Medicine (JUCAVM) in Ethiopia.

a. First of all we conducted an informal curriculum evaluation with key representatives of the horticulture program, for JUCAVM had been teaching a BSc program on horticulture already. Several points of attention and suggestions for improvement were identified and documented.
b. Also stakeholders were identified, such as producers, the export association, research institutes, governmental bodies and ngos. Various representatives of these stakeholder categories were identified and selected for site visits and interviews. We called this the needs assessment, basically it was the review of future tasks and competencies of MSc alumni in the organizations these persons represented.
c. This led to occupational profiles and competence lists.
d. A labour market analysis was incorporated in this study.
e. Also, opinions of experts were collected via interviews and literature study, and model practices were detected.
f. A further literature analysis was done to see what was going around in the field of horticulture training and development.
g. Based on this a draft curriculum proposal was prepared.
h. The next step in the methodology was an invited curriculum deliberation conference about the curriculum proposal, with sector and education quality issues as background information.
i. As a follow-up the curriculum was revised and teaching guides were developed.
j. Next the program was implemented and continuously evaluated and updated.

Obviously, many variations on these strategies are possible, and are indeed practiced and tested.

8. How to go from a competence-based curriculum to lesson plans and active and student-centred learning?

We repeatedly see that competence-based learning, which goes along with sufficient levels of self-regulation and cooperation, adds to the motivation of the students. It is important to also appreciate that students in professional and higher education are important stakeholders in the process of education, that they are not mere consumers, but that they are co-producers in the process of educational development, teaching and learning. Sometimes it looks like educators perceive their students as mute children; but of course they are not, they are grown-ups, who have their own opinions and suggestions that are definitely different from teachers who went to school in earlier times. The present generation, be in in the Western world or in the South, grows up with social media naturally. The consequences of that development for learning cannot easily be overestimated. And the level of knowledge amongst teachers and students is often reversed regarding this, especially for older lecturers and professors.

The step from curriculum to learning can be facilitated in various ways. As mentioned above, the curriculum specifications in the project for the Horticulture MSc were taken as a starting point for the development of teaching guidelines, which specified lessons objectives, subject matter, lesson planning, learning activities, assignments, feedback, etcetera. In the teaching guidelines specific attention was given to activating learning strategies. This went hand in hand with putting emphasis on student-centred learning instead of teacher centred learning, as is frequently the case. Course assignments were developed in such a way that the learning process of the student was supported, and not the teaching of the teacher. In participatory workshops, lecturers were made aware of the value of interactive teaching methods, and they

practiced these. These activities for continuous professional development of teaching staff should in fact be integrated in human resource management policies and practices of the educational institutions.

Conclusion

In this contribution I have tried to give an overview of the basic questions I frequently received regarding the development and implementation of competence-based education and training. I have also given my reactions to those questions, and I would like to add that these are not the only nor the absolute answers to the questions. Others may come up with other answers. But I maintain that competence-based education is a promising educational innovation, provided that it is really competence-based, and comprehensive (Mulder, 2012), and not just a phrase. I have explained that the 'competentiveness' of an education and training program can be clarified by applying the principles (which reflect 'good' or 'quality' education in my opinion) of competence-based education to the program. Until now I believe that many programs in education can benefit from applying these principles.

Of course, effects of competence-based education cannot be expected overnight. Effects will be visible on the longer term, a couple of years after graduation. But the first signs of that are promising (Mulder & Gulikers, 2010).

Further recommendations regarding the implementation of competence-based education and training are:

- Design and implement a quality management and development program; part of this will be an integrated evaluation system (course, semester, year, program, by teachers, students, alumni and other external stakeholders);
- Implement a human resource management strategy and practice that stimulates commitment of all parties involved; make that HRM competence-based;
- Implement competence-assessment top-down, including the management of the educational institution (to avoid discrepancies between the espoused theory and the theory in use);
- Overcome the traditional inspectorate approach by sticking to teacher and institution assessments which do not comply with the principles of competence-based education;
- Build strong relationships with stakeholders outside the educational institutions, to enable outside-in thinking;
- Create facilities for teaching staff to update their own knowledge about current practices in business and industry;
- Link educational programs also to follow-up programs, including to admissions to foreign MSc and PhD programs;
- Develop practical courses for life-long learning of lower-educated workers in farms and other organisations. This can be arranged in such a way that trainees can build up a portfolio that gives them the opportunity to enter a certificate or diploma program with exemptions. Models for the accreditation of prior learning and competence assessment can help to achieve this. Intensive interaction for this is needed between all stakeholders.

Finally, why are we advocating all this? For me that is obvious: to improve the quality of education and to serve the needs of all stakeholders (the students in the first place of course), including economic sectors, and developing societies as a whole.

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