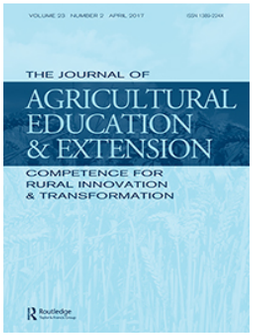

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EDITORIAL

# A Five-Component Future Competence (5CFC) Model

As you have undoubtedly noticed throughout the past years, the field of competence has been my favourite topic of research. More than 15 years ago (Mulder 2001) I made my entry in the *Journal of Agricultural Education and Extension* with a publication on background thoughts regarding competence. That publication was the result of several years of research on competence management in predominantly large organizations in the Netherlands. The question of that research was how companies were using their core competence to optimize their performance, how they were managing their business processes in such a way that they would have the right competencies in the right place, and what this meant for competence development of the co-workers in the organization, leadership included. It was already visible at that time that competence was going to be a big thing, and the literature on it was exploding. Actually, looking backward, that was not surprising, because competence is of key importance for effective performance and has been grossly lacking in many places (Raven and Stephenson 2001).

My interest in competence goes back to my work at the University of Twente, in the mid-1980s, when I was invited to participate in a study on basic skills in vocational education. The question in that research project was which consequences resulted from the developments in emerging technologies for the curriculum of vocational schools. Technologies we studied were production technologies in mechanical engineering and office technology, both for engineering and administrative education. Later on this study was replicated in different contexts, also once more in the context of office technology (Mulder 1989). What we in fact did was thinking about the future needs of education in these fields of study. As will be clear in this editorial, the interest I had in what professionals need in terms of knowledge, skills and attitudes, was never going to disappear, and culminated in various publications until the last one (Mulder 2017).

An important question regarding the study of competence, or professional competence (Mulder 2014) if you will, is what this has to do with agricultural education and extension. To give a short answer to this: in my opinion, a lot. Like in e-based production technology or smart office design, in knowledge-intensive agriculture, farm management, logistics in supply chains and networks, electronic marketing, web-based purchasing, climate-neutral construction, sustainable pest control, increased animal welfare, quality control, finance and governance, many developments are going on, some incremental, some disruptive. These developments have various consequences for the professionals working in and for agriculture, at different levels in different specializations, be it in crop farming, animal husbandry or aquaculture. Effects of climate change have to be taken into consideration, as well as goals regarding sustainable development. Researchers, engineers, planners, politicians and the industry have to design solutions for pressing problems, keeping the balance between people, planet and profit-related objectives in mind. The big question here is the same as we were studying in the project on basic skills: which competencies do people need to not only cope with the developments which are taking place, but to also contribute to create solutions for the current and future challenges to feed the global population, to sustain sufficient production with respect for the natural resources, and to warrant access to healthy food for all. Competence studies have to come up with suggestions of competencies people need for this. This does not only apply to the improvement of farming; it is much bigger than that. It certainly includes specifications of what is needed to foster production, to lower costs and maximize margins, but it is

also about creating new business models, developing alternative value propositions or crossing boundaries. It may even apply to radical changes of economic activities of farmers who close their business because of the lack of future perspective and the earning power of their present activity. In the Netherlands it is expected that around 1000 dairy farmers will close their business during the course of 2017 because they do not see a viable future in milk production under the conditions of the set EU agricultural policy and the national agreement on phosphate reduction. The question then becomes which competencies are needed to realize this dramatically life-changing transformation in a positive-constructive way.

The study of competence is applicable to all human performance. This was rightfully mentioned by a student at the Agricultural University of Tirana, Albania, when I was giving a lecture there on competence development for rural development couple of years ago. The lecture was about precisely the topic of professional competence, and the remark was that competence principles can be applied for rural development and innovation, but also for personal and career development. This is indeed true as competence management, assessment and development can be conceptualized at (inter)national, sectoral, regional, organizational, departmental, team and individual level. And when extended to farmers, in a study on greenhouse farming (Mulder et al. 2007), we found it quite remarkable, that farmers became conscious of the fact that everyone had an individual competence profile (they themselves too), that competence is related to business performance, that it can be developed, but on top of that, that they could provide conditions for developing competencies of their co-workers by turning the working place into a learning place and their organization into a learning organization. The students in my class in Tirana discovered that the competency profiles they had could be compared with existing competence frameworks for given jobs and professions, which was an eye-opener for them as well.

After 2001 I have been summarizing my insights on competence development in the *JAEE*, such as on competence-based education (Mulder 2012a) and about frequently asked questions on competence-based education (Mulder 2012b). Beyond the *JAEE* I have been publishing my thoughts as well, for instance in the international handbook on research in professional and practice-based learning (Mulder 2014). Given this deep involvement in competence theory, research and practice, and the lack of an extensive overview of the field worldwide, I decided to produce a book (Mulder 2017) which would cover the whole field and would fuel the discussion on perennial problems regarding the definition of competence, the use of it in vocational and professional education policy-making and practice, the educational systems elements of competence-based education, and the emergent developments in domain-specific and transversal competence domains such as intercultural cooperation, argumentation, entrepreneurship and computational thinking, to name just a few.

During the production of the book just mentioned, and writing the introductory and conclusion chapters, I noticed that many competence approaches, which started in the early twentieth century to improve teacher training, were primarily aimed at preparing students and workers in the industry to perform specific and known tasks. In the teaching profession as well as in industry and the military, many of these tasks existed and masses of people needed to be prepared for those. Hence the rise of the training industry. Later on, during the emergence of vocational education systems and in the corporate training sector, students and workers were also being prepared for complete jobs, which were mainly existing jobs. Competence frameworks were defined for professions and education and training programmes, and laid the foundation for competence-based education and training in schools and colleges and competence management and development in companies. So, the majority of the competence approaches in the twentieth century were aimed at performance improvement for known tasks and existing jobs.

However, during the last decades the common understanding became that education is preparing generations of graduates for whom the jobs do not yet exist. The same holds for developments in the agriculture, food and health sectors. It is not known what these sectors will look like in 2030 and beyond. We can make informed guesses, and we need to conduct scenario studies, but we are not sure which scenario will unfold.

Given this shift in thinking about competence, and more specifically competencies, it seemed to me that it was important to address the issue of future-oriented competence. Stimulated by the work on the book I mentioned, but also by the invitation to give a key note speech on competence for the future in Copenhagen, Denmark in October 2016, I chose this topic for my farewell speech later that month (Mulder 2016), which I mentioned in my previous Editorial. While I was preparing the booklet for the speech, I noticed that there have been many attempts already to map competencies for the future, such on life competencies, key competencies, essential learning outcomes, survival skills, twenty-first century skills, global competence, and critical competencies. I will not elaborate on these, but you can find the review online (at: http://www.mmulder.nl/). What I would like to copy from the booklet and the speech however, is the model I developed after having reviewed the different studies which mapped future-oriented competencies, and baptize it as the Five-Component Future Competence Model (5CFC Model) (see Figure 1).

This 5CFC Model represents the idea that learning competence is the core of future-oriented competence. It is being influenced by competencies on two dimensions, the vertical dimension of disciplinary and interdisciplinary competence and self-management and career competence, and the horizontal dimension of personal-professional competence and social-professional competence. In the booklet of my farewell speech, these competence domains are all further specified.

The model can be applied to all professions, also to farming, although it will typically vary by business model the farmer employs. A large-scale corn grower or livestock farmer needs different competencies than a farmer who is specialized in care farming or a dairy farmer who is producing cheese for the regional market, even though they all need the five big competencies listed in the model in general.

A multi-functional farmer for instance, who is specialized in dairy farming and day care for mentally challenged people, needs knowledge in the *disciplinary and interdisciplinary* domain

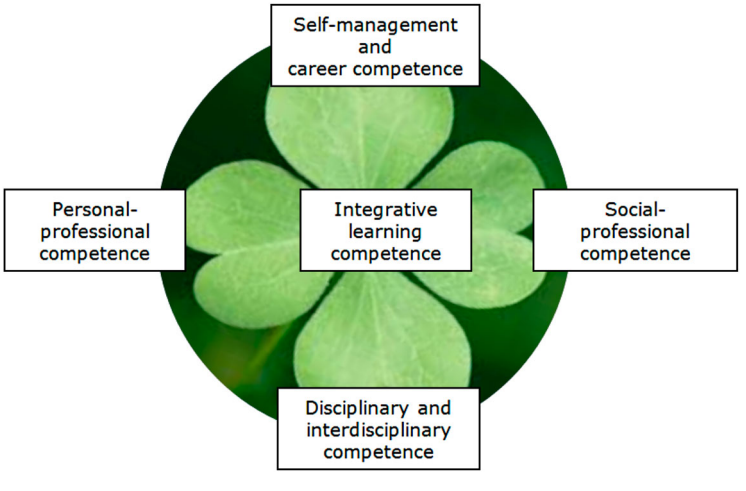


**Figure 1.** Five-Component Future Competence Model.

about both dairy farming such as emission quota and administration, feed systems, investment strategy and mental health care, such as care plans, daily activities and special needs. As for dairy farming they need a licence for their day care facility.

In the *self-management and career competence* domain they need to be able to act as independent entrepreneurs, and to self-regulate their business. They need to able to plan their family life along to the two lines of specializations, with different expectations. They need to be able to balance the activities in the dairy farm and the care farm, and to take calculated risks regarding the financial frameworks of both.

In the *personal-professional* competence domain they need to be able to adapt to profound change, be flexible in using opportunities, agile in accommodating regional innovations and handle emotions regarding the communication with other users of the regional space, but also with clients on both sides of the enterprise.

In the *social-professional* competence domain they need civic knowledge and engagement as they have to deal with different claims of different stakeholders, which influence the daily operation of their business. They need to be able to negotiate, often also in a multicultural sense. They need to be able to facilitate productive teamwork in the dairy farm and the day care centre, create ecosystems for engagement and manage and resolve conflicts with different parties within and outside the farm.

The descriptions of the competence domains in the farewell booklet are more elaborate and can be specified for all actors in all economic sectors, such as in agriculture, food and the environment. I hope the 5CFC Model will serve as an input for the discussion on future-oriented competence, a discussion which will never end, as change necessitates new competencies, and change in permanent.

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