

PLEASE CITE/QUOTE AS:

Lans, T., Bergevoet, R., Mulder, M. and Van Woerkum, C. (2005). Identification and measurement of competences of entrepreneurs in agribusiness. In: Batterink, M., R. Cijssouw, M. Ehrenhard, H. Moonen and P. Terlouw (eds.). Selected papers from the 8th Ph.D. Conference on Business Economics, Management and Organization Science, PREBEM/NOBEM, Enschede. Pp: 81-95.

## IDENTIFICATION AND MEASUREMENT OF COMPETENCES OF ENTREPRENEURS IN AGRIBUSINESS

Thomas Lans; Department of Social Sciences, Education and Competence Studies Group,  
Wageningen University\*

Ron Bergevoet; Department of Social Sciences, Business Economics Group, Wageningen  
University.

Martin Mulder; Department of Social Sciences, Education and Competence Studies Group,  
Wageningen University.

Cees van Woerkum; Department of Social Sciences, Communication Science Group,  
Wageningen University.

\* Corresponding author. Contact information:

P.O. Box 8130

6700 EW Wageningen, The Netherlands

[t] +31 317 48 43 43

[f] +31 317 48 45 73

[e] thomas.lans@wur.nl

### Abstract

*In the last decade the competence concept has become a central theme in the debate on the development of vocational education, training and organisations. Also in the conceptual domain of entrepreneurship there appears to be more interest in the competence concept. In order to use the competence concept in a learning and development perspective it is necessary to measure competences and competence development of entrepreneurs in a reliable and valid way. In this study of micro and small sized enterprises in agribusiness, we therefore tried to identify and measure the level of competence of entrepreneurs. The objectives of the study were (i) identifying and measuring the most important competences, (ii) applying them to different sub-sectors, and (iii) providing entrepreneurs with possible areas for development. Based on a triangulation of methods the assessment seems to generate results that are recognisable, usable and valid in each of the 16 cases tested. The competence profile derived provides the individual entrepreneur with further areas for development. Moreover, the profile provides clear starting points for research on factors that influence the process of competence development in the domain of entrepreneurship.*

*Keywords: competences, entrepreneur, assessment, agri-business.*

During the last decade the issue of competence development has received a great deal of attention. This attention has mainly focussed on larger organisations, using competences to manage and implement change (Mulder, 2001). However, increasing use is being made of competences in other contexts; the competence concept has become a central theme in the debate on the development of vocational education and training, scientific education and in organisations (Mulder, 2004). There also seems to be increasing interest in the competence concept within the conceptual domain of entrepreneurship (Caird, 1992; Chandler and Jansen, 1992; Bird, 1995; Dahlgvist, 1999 and Man et al., 2002). This interest in the concept rests on the assumptions that competences are recognisable, assessable and relevant for practice, that they can be developed, learned and described on different levels, and it is supposed that there is a strong relationship between competence and organisational effectiveness (Caird, 1992).

In order to use the competence concept in the field of entrepreneurship it is necessary to identify and measure competences and competence development of entrepreneurs in a reliable and valid way. In general, new analytical frameworks and empirical research are needed to combine current thinking on entrepreneurship and competences (Dahlgvist, 1999). The identification and assessment of competences of entrepreneurs is interesting from a scientific as well as a practical point of view. If competences of entrepreneurs can be assessed unambiguously, the learning process that underlies competence development and the link between competence development, enterprise performance and personal development can be studied in detail. However, concrete instruments to measure competences of entrepreneurs with the accent on learning and development are not yet available. Therefore, a tentative assessment procedure for the identification and measurement of competences of entrepreneurs in agribusiness was developed.

The objective of this study was to develop an assessment tool to identify and measure the level of competence of entrepreneurs in micro (0-9 employees) and small-sized (10-49 employees) enterprises in different sub-sectors in agribusiness and to test and validate the instrument in practice. The assessment tool should provide the entrepreneur with a detailed picture of his or her competences, a mirror of his or her competence profile. The profile should show the level of competence, but also indicate possible areas for further development.

The outline of this paper will be as following:

The next paragraph discusses competences in the domain of agricultural entrepreneurship. In the following paragraph the methods used for the design and procedures followed are described, after which the results are presented. The paper finishes with some points for discussion, conclusions and recommendations for further research in the field of competences and entrepreneurship.

## Competence in the conceptual domain of agricultural entrepreneurship

This research focuses specifically on entrepreneurs in the agricultural sector in the Netherlands. The agricultural sector employs 50% of all the labour in the agri-food sector, and accounts for 25% of the total agricultural complex. The sector consists of numerous micro-, and small to medium sized enterprises. The primary production sector comprises dairy farms, farms with grazing stock, arable farms, field vegetables farms, farms with intensive livestock production, glasshouse and mushroom production and mixed farms (Ministry of Agriculture, Nature and Food Quality, 2004). The total population consisted of 85,500 enterprises in 2003. The environment in which these entrepreneurs operate is increasingly changing and developing, companies must adapt to the vagaries of the market, changing consumer habits, stricter environmental regulations and so on. While goals are not always clearly specified, innovation in the broadest sense receives high priority.

Running an enterprise successfully in this dynamic setting requires substantial tangible resources, such as physical or financial capital. In addition to material assets, success is also dependent on the more intangible resources embedded in the enterprise, such as the entrepreneurial capital (Erikson, 2000). From research on entrepreneurship it is known that in markets characterised by dynamic change some

entrepreneurs become alert and develop knowledge, making (deliberate) information investments that others do not (Busenitz et al, 2004). In the research on the desirable intangible assets of entrepreneurs, a variety of characteristics of entrepreneurs have been examined. Entrepreneurial characteristics are approached from a number of angles in the scientific literature. Two basic approaches can be distinguished. The first focuses on personal traits and characteristics, the second on competences. Personal and psychological factors are important factors for entrepreneurial success. Some of the most mentioned traits include perseverance, energy, diligence, resourcefulness, creativity, foresight, initiative, versatility, intelligence and perceptiveness (see for instance McClelland, 1987 and Ciavarella, 2004). However, these factors are often taken as given, and it is assumed that change or improvement is difficult. The research of McClelland (1987) highlights the importance of competences extracted from behavioural event interviews, rather than merely focussing on general trait characteristics as predictors for success. Nowadays, most interpretations of competence represent an integration of knowledge, capabilities, skills and attitudes displayed in a context with an appropriate level of generality or holism (Biemans et al., 2004), rather than a merely behaviouristic (focussing solely on the outcome) interpretation. This definition seems to be rather limited, however. Reality is much more complex and there seems to be a lot of ambiguity surrounding the definition of competence. Confusion about the concept is also exacerbated by the objectivistic drive to formulate one overarching definition of competence. Stoof et al. (2002) argue that it is not important to prove whether the definition of competence is true or not, but whether it is adequate in the context in which it is used. Hence, it is better to work with some guidelines, rather than a stipulated definition (Biemans et al., 2004). From this perspective we would suggest that competences are:

- context-bound,
- subject to change,
- connected to activities and tasks,
- subject to learning and development processes ,
- and they are interrelated.

Man et al. (2002) categorised entrepreneurial competences in six key areas of related competences. The key clusters are opportunity, relationship, conceptual, organising, strategic and commitment competences. In the literature on competence profiles of entrepreneurs and managers, several competences that meet the outlined criteria and fit in one these six clusters can be recognised (Erkkilä, 2000; Hoekstra & Van Sluijs, 1999, Van den Tillaart, 1987, Man *et al.*, 2002; Onstenk, 2003; Mulder, 2001; McClelland, 1987). These competences can be regarded as underlying competences. Table 1 presents an overview of the competence clusters and the underlying competences mentioned in the literature.

*Table 1. Competence clusters with description and underlying competences (after Man et al., 2002).*

	Competence cluster (Man et al. 2002)	Description	Underlying competences <sup>1</sup>
1	Opportunity competences	Competences related to recognising and developing market opportunities through various means	General awareness International orientation Market orientation
2	Relationship competences	Competences related to person-to-person or individual-to-group based interactions	Communication Negotiation Networking Persuasiveness Teamwork
3	Conceptual competences	Competences related to different conceptual abilities which are reflected	Conceptual thinking Problem analysis

		in the behaviour of the entrepreneur	Vision and judgement
4	Organising competences	Competences related to the organisation of different internal, external, human, physical, financial and technological resources.	HRM/HRD Leadership Planning and organisation
5	Strategic competences	Competences related to setting, evaluating and implementing the strategies of the firm	Learning orientation Management control Result orientation Strategic orientation
6	Commitment competences	Competences that drive the entrepreneur to move ahead with the business.	Self-management Value clarification Vision

<sup>1</sup> based on (Erkkilä, 2000; Hoekstra & Van Sluijs, 1999, Van den Tillaart, 1987, Man *et al.*, 2002; Onstenk, 2003; Mulder, 2001; McClelland, 1987).

There are a variety of methods available for developing a model of entrepreneurial competences and to assess these competences; the various methods are qualitative, quantitative, retrospective, concurrent, objective and self-report based (Bird, 1995).

Caird (1992) evaluates four research strategies for assessing competences on their suitability for identifying enterprise competences. The first strategy is the critical incidents technique (CIT) (further developed as the well-known Behavior Event Interview method by McClelland (1998)). The CIT/BEI technique focuses on the difference between average and excellent performers in a job. Besides the fact that the technique is time consuming another important point of criticism is that the CIT/BEI highlights extremes. The focus is on the excellence of workers, rather than measuring the broad scale of competences that the entrepreneur possesses. The CIT/BEI only provides information about the top level of competence (Caird, 1992). Respondents also have the tendency to focus on success rather than on failure, which biases the outcomes.

A second method described by Caird is the job function analysis. The job function analysis is a well-known technique for curriculum development and involves the analysis of task functions related to a certain job or profession. Specific knowledge and skills for this job or function can be inferred from this profile. The job analysis method has some major disadvantages. Firstly, the method is very time consuming. Secondly, the techniques focus on the job description and therefore fail to discern between levels of competence. Thirdly, the result of the job function analysis is often an atomised description of skills, knowledge and attitude, with no guarantee that mastery of these sets will lead to competent performance. Finally, the job function analysis method is a rather conservative method, new competences are easily neglected.

A third method consists of the so-called behaviourally anchored rating scales (BARS). BARS are used to identify criteria for effective performance, using evaluation of job performance. The evaluation is conducted by a supervisor, and therefore relies to a large extent on the ability of the supervisor to observe behaviour. A pitfall of this technique is that the focus is merely on the outcome, which may neglect the underlying learning process.

The fourth method described by Caird can be labelled the action research method (Morgan, 1988 in Caird, 1992). Morgan's action research method promotes self-reflective enquiry and team work by managers. The method focuses on the organisational needs and strategic concerns. It provides a picture of the competence needs for strategic development. A disadvantage of this technique is that it focuses on the needs rather than the actual competences present.

There are also many variations on these four broad strategies, ranging from observations to entrepreneurship games. For a complete overview see Bird (1995). Bird (*ibid.*) argues that when considering using a particular assessment method, it is important to find examples of this method in other published research, consider time and money aspects, and moreover to determine the reliability

and validity of the method for appropriate analysis and conclusions. Luken (2004) mentions some additional aspects to take into consideration when measuring competences: (1) the definition of competence is not a homogeneous definition; (2) competences are not stable; (3) competence assessments are always subjective (4) competence assessments are based on individuals, whereas the definition of the competence concept tries to include the context as well; (5) the competence concept includes capacity, whereas it is also important to look at actual performance.

Although the above mentioned methods do have elements that should be taken into consideration, it can be concluded that none of them are completely suitable for assessing entrepreneurial competences in this context. Hence, based on the considerations outlined, six main design criteria were formulated:

- A focus on the integration of knowledge, understanding, attitudes and skills (visible and hidden elements);
- A focus not merely on behaviour outputs, but also on the ongoing training and education process;
- A focus in the first instance on the actual competences and not on competence needs;
- The measurement of competences is not a matter of measuring the facts, but also of discussing, interpreting and negotiation;
- It is important to rate competences in more than one way. One way of making a relatively valid and reliable assessment is to use different assessment methods;
- Although it is hard to explain the meaning of abstract constructs such as competence, people do have some kind of notion of what it entails (Stoof et al., 2002). As McClelland argues, ‘people agree more readily on who is outstanding than on what makes them outstanding’.

## Methodology

Based on the evaluation of the assessment methods and the theoretical considerations outlined above, a procedure was designed. The taxonomy of Man et al. (2002) and the underlying competences shaped the framework within which the assessment procedure was developed. To give a detailed picture of the actual competences and development issues in important competence clusters of the assessed entrepreneurs, a triangulation of assessments procedures was used. These were: (1) a self-assessment procedure, (2) a peer-assessment procedure and (3) an expert-assessment procedure. The self-assessment questionnaire consisted of three parts. In the first part of the self-assessment, the entrepreneurs had to answer several questions about themselves and their business (education, work experience, type of business, ultimate goal). In the second part the entrepreneurs had to rank the importance of the twenty-two selected entrepreneurial competences. In the third part the respondents had to rate statements that corresponded (positively or negatively) to these competences on a five-point Likert scale. A similar peer-assessment questionnaire was designed based on the self-assessment questionnaire. In the peer assessment, a peer (‘professional colleague’) selected by the entrepreneur had to rate their professional colleague based on the same statements that were used in the self-assessment. Finally an expert assessment was developed. The expert had to rate the entrepreneur for the twenty-two selected competences, on a five-point Likert scale. The self-assessment is given in appendix A (in Dutch).

### Participants

Before conducting the assessments, the questionnaire was pre-tested by two entrepreneurs and two content experts on clearness, use of language and user friendliness. To test the assessment procedure, 16 entrepreneurs were selected, from three distinct agribusiness sub-sectors: vegetable production under glass (5), floriculture (flower production) (5), and dairy farming (6). Experts working in the

different sub-sectors selected the entrepreneurs. The expert had to be knowledgeable in the agricultural sub-sector and had to have a professional understanding of the entrepreneur's activities. Entrepreneurs, peers, and experts were asked to fill in the questionnaire and send it back to the first two authors. After processing the results, the entrepreneurs and experts received feedback on the results.

### Analysis

After entering them in a database, the scores of the individual questions on the different clusters were combined. An average score was calculated for each different competence area. These average scores were used in the further analysis. Simple statistical analysis (mean and standard deviation) was performed.

After completing the questionnaire the results of the self- and peer assessment were presented to the entrepreneurs. The scores were presented in a spider-plot format (see the examples in figure 1 & 2).

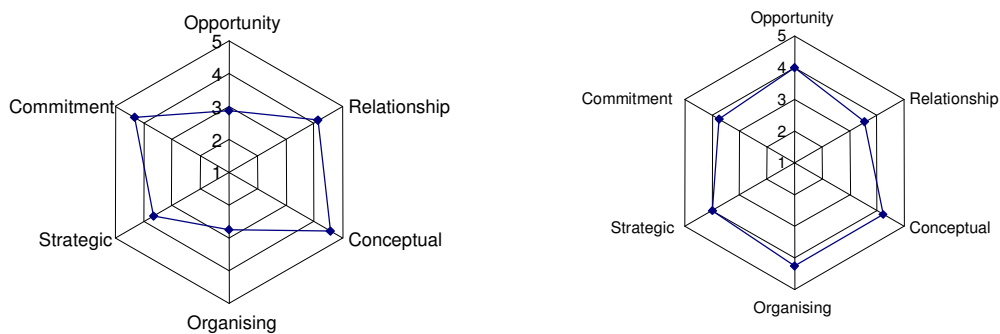


Figure 1 & 2 Self-assessment scores: case 1 and case 2

The content validity was assessed by comparing the scores of the self-assessment and the peer assessment ( $S_A-P_A$ ), the scores of the self-assessment and the expert assessment ( $S_A-E_A$ ) and the scores of the peer- and expert assessment ( $P_A-E_A$ ) for all the competences measured. Both the average and the standard deviation were calculated for all these differences (the latter as a measurement of how tightly all the scores are clustered around the mean, and therefore an indicator of how much consensus there is about a competence cluster).

Reliability was defined as the consistency of the scores. There are two ways of looking at reliability: inter-item reliability (consistency between the different questions per item) and test-retest reliability (consistency in time) (Shrock, and Coscarelli, 1989). Since the sample was too small for a serious inter-item reliability test and the focus was on competence development rather than stability over time, reliability was primarily sought in the assessment techniques and questionnaires used by other researchers in the domain of agribusiness and entrepreneurship (Chandler and Jansen, 1992; McClelland, 1987; Lans et al., 2004; Bergevoet et al., 2004).

Usability in this study was defined as the level of practical use of the assessment procedure for competence development of entrepreneurs. A discussion of the results with the experts afterwards was introduced in order to improve usability of the assessment procedure in practice. Three questions structured this discussion: are the results of the three methods recognisable, are the results usable in practice and thirdly in what way can the results best be presented to the entrepreneurs themselves?

## Results

Table 2. Scores on the different entrepreneurial competence areas: comparison of the entrepreneurs' results with the assessment results of peers and experts.

	S <sub>A</sub>		P <sub>A</sub>		E <sub>A</sub>		S <sub>A</sub> -P <sub>A</sub>		S <sub>A</sub> -E <sub>A</sub>		P <sub>A</sub> -E <sub>A</sub>	
	Avr	Stdev	Avr	Stdev	Avr	Stdev	Avr	Stdev	Avr	Stdev	Avr	Stdev
Opportunity	3.32	0.77	3.18	0.82	3.22	0.76	0.15	0.87	0.12	0.99	-0.15	1.13
Relationship	3.72	1.11	3.76	0.74	3.59	0.82	0.02	1.21	0.19	1.36	0.07	1.11
Conceptual	4.10	0.80	3.91	1.04	3.44	0.78	0.27	1.35	0.69	1.00	0.45	1.35
Organising	3.95	0.96	3.61	0.89	3.53	1.01	0.29	1.13	0.21	1.24	-0.19	1.47
Strategic	3.59	0.72	3.66	0.74	3.69	0.94	-0.05	0.95	-0.08	1.00	-0.11	1.18
Commitment	3.74	0.78	3.87	0.87	3.45	0.89	-0.13	0.97	0.34	1.10	0.43	1.43

Absolute average (rated on a five-point scale, 1=not at all...5=very much present) and the average and standard deviation of the differences of S<sub>A</sub>, P<sub>A</sub> and E<sub>A</sub> (subtracting P<sub>A</sub> from S<sub>A</sub>, E<sub>A</sub> from S<sub>A</sub> and E<sub>A</sub> from P<sub>A</sub>). S= self (entrepreneur), P= peer and E= expert. (n=16).

In general, the entrepreneurs gave themselves high scores on the competences areas, although the standard deviation is considerable. As can be seen from table 2, in three of the six clusters, the entrepreneurs rate themselves higher (in absolute numbers) than their peers and experts do. Comparing the average self-assessment scores with the peer-assessment scores (S<sub>A</sub>-P<sub>A</sub>), shows that the clusters *strategic* and *relationship* have the smallest differences. The largest differences are found in the clusters *conceptual* and *organising*. Comparing the average of the self-assessment scores with the expert-assessment scores (S<sub>A</sub>-E<sub>A</sub>), the smallest differences were found in the competence clusters *opportunity*, *relationship* and *strategic*. The largest differences were found in the clusters *conceptual* and *organising*. There are larger differences between the self- and expert assessment than between the self- and peer assessments (see the scores in the average and standard deviation columns). Comparing the data of the peer- and expert assessments (P<sub>A</sub>-E<sub>A</sub>) produces a slightly different picture. Most consensus is found in the *relationship* cluster, followed by the *strategic* and *opportunity* clusters. The largest differences are found in the *conceptual* and *commitment* clusters. What is important to note is that the standard deviation across all three differences of S<sub>A</sub>, P<sub>A</sub> and E<sub>A</sub> is considerable (indicating less consensus about a competence cluster) but is lowest for all three in the cluster *opportunity*.

According to the experts, the results of the three assessment methods were recognisable. This can be best exemplified by the portrayal of two extreme cases. In one case in floriculture (see figure 1 in the methodology paragraph), there were serious issues concerning the planning and organisation, personnel management and leadership of the entrepreneur in question. These issues had been primarily raised by advisors from the bank, who had serious doubts about the way the entrepreneur organised his business. Some of the staff had recently been fired because of 'mismanagement' and according to the bank there was a lack of clarity about who was in charge of the business and what the future prospects (for instance potential new markets) were. These two issues are indeed reflected in figure 1, indicated by the (low) scores of the entrepreneur on the clusters *organising* and *opportunities*. On the other hand, the experts described this entrepreneur as very committed with regard to organic and environmental aspects. This manifested itself in his business in the use of biological control agents. These aspects were also reflected in the competence profile, where the entrepreneur scored high in the commitment cluster. In another case (from the sector 'vegetables under glass'), the entrepreneur was well known for his energy-saving management. According to the experts, the entrepreneur could be characterised as a master in optimisation. He is eager to keep things under control and registers everything that is happening in his business. On the one hand he is focussed on maximising control of the biological processes in the greenhouse, on the other he is also focussed on optimising the external environment. In sum, this entrepreneur seems to be a rather all-round entrepreneur, with a lot of qualities. According to the experts, this entrepreneur could be characterised as a manager (optimising processes in his business). These aspects are also reflected in the competence profile (figure 2). This entrepreneur scored relatively high on all clusters, but especially high on the organising cluster.

With regard to the usability, several important aspects were mentioned by the experts. Firstly a clear distinction can be made between the one-man businesses and the ‘partnerships’ consisting of more than one business owner. In the latter case the entrepreneurial competences are ‘dispersed’ (ideally) over several individuals. According to the experts a distinction of competences based on roles can be made, especially the differentiation between the more entrepreneurial role and the more managerial role. Competences that seem to be related to the entrepreneurial role are networking, conceptual thinking, value clarification and international orientation. Competences that seem to be related to the managerial role are learning orientation, result orientation, teamwork, planning and organising. Moreover, the triangulation of methods also provides serious points for discussion in some cases, especially in the case where there is a fairly large difference between the self-perceived competences and the scores given by the peer or expert.

Table 3. Average ranking of the six competence clusters for the different sub-sectors.

Cluster	Average	Vegetables under glass (n=5)	Floriculture (n=5)	Dairy (n=6)
Opportunity	14	14	13	14
Relationship	10	11	9	9
Conceptual	13	10	14	15
Organising	10	9	12	11
Strategic	10	10	11	9
Commitment	13	13	11	13

The numbers indicate the rank scores from 22 (1=highest importance...22=lowest importance), based on the average (absolute) scores of the different underlying competences rated by the respondents (n=16).

The relative ranking of the different competence clusters is shown in table 3. The entrepreneurs themselves rank the competence clusters *relationship*, *organising* and *strategic* as the most important clusters. Comparing the different sub-sectors indicates a difference in the importance for the six clusters. For vegetables under glass *organising* competences are considered most important, whereas the most important for floriculture are *relationship* competences and for dairy it is *strategic* competences.

Table 4. Average scores of the self-assessment on the six competence clusters for the different sub-sectors.

Cluster	Average	Vegetables under glass (n=5)	Floriculture (n=5)	Dairy (n=6)
Opportunity	3.32	3.63	3.67	3.28
Relationship	3.72	3.47	3.41	3.94
Conceptual	4.10	4.33	4.31	3.61
Organising	3.95	4.26	3.82	4.33
Strategic	3.59	3.75	3.70	3.56
Commitment	3.74	3.80	3.69	3.63

Rated on a five-point scale (1=not at all...5=very much present), based on the average (absolute) scores of the different underlying competences rated by the respondents (n=16).

The self assessment scores of the entrepreneurs in the different sub-sectors are given in table 4. The entrepreneurs in the sub-sector vegetables under glass score the highest in the cluster *conceptual* and the lowest in the cluster *relationship*. The entrepreneurs in floriculture scored also highest in the cluster *conceptual* and lowest in the cluster *relationship*, whereas the dairy farming entrepreneurs scored the highest in the *organising* cluster and the lowest on *opportunity* competences.

To investigate the relation between the relative importance of a competence cluster and the actual scores, table 3 and 4 were compared. Vegetables under glass had the highest self-assessment scores in what they considered the most important clusters. For floriculture the opposite was true: the cluster *relationship* was considered most important but received the lowest score. The dairy group had a somewhat intermediate position.



## Discussion and conclusions

This study attempts to gain an understanding of the competence concept in the conceptual domain of entrepreneurship. It seems to be possible to identify and measure the most important entrepreneurial competences using an assessment procedure and a triangulation of assessments. The triangulation of assessments by entrepreneur, peer and expert revealed that there is more agreement among the different assessors in the competence clusters related to the more entrepreneurial competences (*opportunity* and *strategic*). In the other clusters there is less consensus about the level of competence.

The entrepreneurs recognise the results that are derived from the questionnaire as representing their competence level. Differences between the self/peer assessments and the expert-assessments may mean several things. First of all, is the expert really an expert on all the competence clusters? How well do you have to know the company (do you have to visit it every week, also taking into consideration the process of competence development, or is it better not to know the business too well, in order to prevent socially desirable answers being given?). Considering experts as 'golden standards' is frequently mentioned in the self-assessment literature as one of the factors explaining why people are poor or moderate judges of one's own competences (for an overview see Ward et al., 2002). In order to find out whether the expert really is a golden standard, the reliability of the experts should be assessed in a complementary study. An alternative way of overcoming problems with the golden standard is to work with multiple experts (Ward et al., 2002). On the other hand it could be that some of the differences between the self-assessment and the peer assessment are simply the result of the entrepreneur giving socially desired answers, or self underestimation or overestimation. In that case, the expert assessment is an essential element of the triangulation. A questionnaire does say something about the (intended) behaviour and motives of the entrepreneurs, whereas the expert assesses actual behaviour (performance). This is especially noticeable in the clusters that are most related to concrete human behaviour (in particular the clusters *organising* and *relationship*). Both extremes have been noticed. On the one hand certain competences in these clusters are underestimated (for instance no confidence in own negotiation competence, whereas peers and experts rate the level of confidence as moderate to even high). The converse is also noticeable, for instance self-assessment of the ability to communicate may differ greatly from the peer and expert assessments. Lastly, the differences between the self/peer scores and the experts scores could also be explained by the fact that the experts had to rate the competences as a whole. If the expert has a slightly different picture of the competence in question, he might make a different assessment from what was meant in the self and peer assessment. In conclusion the assessment procedure seems to be more feasible for some competence clusters than for others. In the area of *opportunity* and *strategic* competences the measurements seem to be the most valid. An alternative to asking the expert to independently assess the competences of the entrepreneur would be to involve the expert in the process of assessing the self and peer scores, and use the expert as a final validation of the assessment. To improve the experts' ratings in practice it would be advisable to develop assessment training for the experts involved, in order to focus on exactly the same aspects of competence.

The learning and development part is also an interesting feature of the assessment procedure. The results seem to provide a good way to confront entrepreneurs with their own qualities and with areas for improvement and discussion. Since it is a learning and development tool, and not a 'test', it should also be communicated that way, not in terms of deficits, but in terms of areas for further improvement. Therefore it is important to know which competences the entrepreneurs themselves consider important for entrepreneurship in their own context. In general the entrepreneurs rate the different clusters as almost equally important. It was noticeable however that *opportunity* competences were rated as the least important, whereas many authors argue that the discovery and exploitation of entrepreneurial opportunities is the heart of entrepreneurship (Shane and Venkataraman, 2000). Competences such as *general awareness* and *market orientation* can be regarded as essential for the development of opportunities. At the same time the self-assessment results revealed that the entrepreneurs score the lowest on this cluster. Hence, is important to discuss the scores with the peer and expert extensively as

a follow-up. Why do entrepreneurs in this sector perceive these competences as relatively unimportant, and, more importantly, what factors contribute to the development of these competences? In a recent review on entrepreneurship research Busenitz et al. (2003) conclude that research in the area where a number of field meet, including individuals, opportunities, modes of organising and the environment are likely to represent important areas for entrepreneurship research. Others argue that the domain of discovering and pursuing opportunities in particular is one of the most promising candidates for a new framework of entrepreneurial competences. Moreover, most research on entrepreneurship investigates entrepreneurial progress after opportunities have been discovered, and do not include the learning process that underlies this progress (Shane, 2000). After this discussion the entrepreneur can decide for him or herself which competence clusters should receive priority for development. Based on this decision the next step will be to think about concrete learning activities (informal or formal) that might contribute to the development of this competence. After a given period, the entrepreneur can decide again to consult his peer and expert to assess whether progress has been made in the development of the selected competences. In this respect, the assessment method can be developed further as a career development tool, building for instance on the work of Defillippi and Arthur (1994) (the competence-based concept of the boundaryless career).

Two other important aspects of the research were whether the procedure could be applied to different sub-sectors in agri-business, and whether the results could be generalised. There are some interesting differences in scores between the three sub-sectors. The horticultural sectors (vegetable & flowers), scored higher on the typically entrepreneurial clusters (*opportunity* and *strategic*) than the dairy farming sector. This difference could be explained by the fact that floriculture in particular is a sector that is historically characterised by entrepreneurship. Floriculture is one of the most successful export sectors in the Dutch economy, and is responsible for about 65% of world exports of cut flowers (Porter and Van der Linde, 1995). Generalisation of the results has consequences especially for the external validity and the reliability of the data. The small sample used in this research has two serious drawbacks here. Although the internal validity is high due to the methods used, the sample is too small and biased to be valid for all enterprises in the sub-sectors that were studied. Secondly, there is the issue of reliability. Due to the small sample, there is no data on how the items in the questionnaire relate to each other. In order to improve the external validity and inter-item reliability, the assessment procedure would need to be applied in further research to a larger sample of entrepreneurs. Nevertheless, it is a matter of doubt as to whether the classical psychometric standards problems, concerning external validity and reliability can be solved (in competence assessments). As argued by Luken (2004), it is very unlikely that competences are homogeneous constructs that can be measured, or that they are stable in time. For instance, a test-retest (testing over time) design will only be useful when the focus is on measuring competence development, rather than using it as a reliability measure. Luken (2004) suggests an alternative standard, the consequential validity. This concept involves not only the assessment scores, but also the *interpretation* and *use* of assessment scores as a basis for action (Messick, 1995). It would therefore be interesting in the future to look for follow-up activities after completing the assessment in a larger sample of entrepreneurs.

With regard to future research, the *opportunity* cluster in particular might provide some interesting starting points. Researching the issue of competence and competence development in the process of discovery and exploitation of entrepreneurial opportunities might provide important insights into how entrepreneurs learn, what they learn most from, whether the competences are shaped by the situation or whether it was the situation that ‘‘activated’’ these competences, and how entrepreneurs’ learning can be stimulated and optimised in order to respond adequately to the changing environment.

## Acknowledgements

We thank Dr. Harm J.A. Biemans and Dr. Jos A.A.M. Verstegen for their advice, assistance and helpful comments on the manuscript.

## References

- Bergevoet, R.H.M., Ondersteijn, C.J.M., Saatkamp, H.W van Woerkum C.M.J. and Huirne R.B.M. (2004). Entrepreneurial behaviour of Dutch dairy farmers under a milk quota system: goals, objectives and attitudes. *Agricultural Systems* 80, 1-21.
- Biemans, H., Nieuwenhuis, L., Poell, R. Mulder, M. and Wesselink, R. (accepted). Competence-based VET in the Netherlands: background and pitfalls. *Journal of Vocational Education and Training*.
- Bird, B. (1995). Toward a theory of entrepreneurial competency. *Advances in Entrepreneurship, Firm Emergence, and Growth*, 2, 51-72.
- Busenitz, L.W., Page West III, G., Shepherd, D., Nelson, T., Chandler, G.N. and Zacharakis, A. (2003) Entrepreneurship research in emergence: past trends and future directions. *Journal of Management* 29 (3) 285–308.
- Caird, S. (1992). Problems with the identification of enterprise competences and the implications for assessment and development. *Management Education and Development* 23 (1), 6-17.
- Chandler, G.N. and Jansen, E. (1992). The founder's self-assessed competence and venture performance. *Journal of Business Venturing*, 7, 223-236.
- Ciavarella, M.A., Buchholtz, A.K., Riordan, C.M., Gatewood, R.D. and Stokes, G.S (2004). The big five and venture survival: is there a linkage? *Journal of Business Venturing*, 19, 465-483.
- Dahlqvist, J. (1999). The entrepreneurial core competences – the 'e-words' revisited. In: C. Salvato, P. Davidsson and A. Persson (eds.). *Entrepreneurial knowledge and learning: conceptual advances and direction for future research*. JIBS Research Reports No. 1999-6.
- Defillippi, R.J. and Arthur, M.B. (1994). The boundaryless career: a competency-based perspective. *Journal of Organizational Behavior*, 15, 307-324.
- Erikson, T. (2002). Entrepreneurial capital: the emerging venture's most important asset and competitive advantage. *Journal of Business Venturing* 17, 275-290.
- Erkkilä, K. (2000). *Entrepreneurial education: mapping the debates in the United States, the United Kingdom and Finland*. Garland, New York/London.
- Hoekstra, H.A. en van Sluijs, E. 1999. *Management van competenties; het realiseren van HRM*. Van Gorcum & Comp. Assen.
- Lans, T., Wesselink, R., Biemans, H.J.A. and Mulder, M. (2004). Work-related lifelong learning for entrepreneurs in the agri-food sector. *International Journal of Training and Development* 8, 72-88.
- Luken, T. (2004). Zijn competenties meetbaar? Dilemma en uitweg bij het werkbaar maken van het competentiebeprijp. *Tijdschrift voor Hoger Onderwijs*, 22, 38-53.
- Man, T. W. Y., Lau, T. and Chan, K. F. (2002). The competitiveness of small and medium enterprises - A conceptualization with focus on entrepreneurial competences. *Journal of Business Venturing* 17, 123-142.
- McClelland, D.C. (1987). Characteristics of successful entrepreneurs. *The Journal of Creative Behavior* 21 (3), 219-233.
- McClelland, D.C. (1998). Identifying competences with behavioural-event interviews. *Psychological Science* 9 (5), 331-339.
- Messick, S. (1995). Standards of validity and the validity of standards in performance assessment. *Educational Measurement, issues and practice*, 14 (4), 5-8.
- Ministry of Agriculture, Nature and Food Quality (2004). *Facts and figures 2004/2005 of the Dutch agri-sector*. Romer, Schiedam.
- Mulder, M. (2001). Competence development – Some background thoughts. *The Journal of Agricultural Education and Extension*, 7 (4), 147-158.
- Mulder, M. (2004). *Education, competence and performance: On training and development in the agri-food complex*. Inaugural address. Wageningen University, Wageningen.
- Onstenk, J. (2003). Entrepreneurship and education. *European Educational Research Journal*, 2 (1), 74-89.
- Porter, Michael E. and Van der Linde, C. (1995). Green and Competitive: Ending the Stalemate. *Harvard Business Review*, 73, 120-134.

- Shane, S. (2000). Prior knowledge and the discovery of entrepreneurial opportunities. *Organizational Science*, 11 (4), 448-469.
- Shane, S. and Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25 (1), 217-226.
- Shrock, S.A. en Coscarelli, W.C.C. (1989). Criterion-referenced test development – technical and legal guidelines for corporate training. Addison-Wesley: Massachusetts.
- Stoof, A., Martens, R. L., Van Merriënboer, J. J. G., and Bastiaens, T. J. (2002). The boundary approach of competence: A constructivist aid for understanding and using the concept of competence. *Human Resource Development Review*, 1, 345-365.
- Van Berkel, A., Hofman, K., Kinkhorst, G. and te Lintelo, L. (2003). *Competentieassessment: de ontwikkeling en toepassing van self-, peer- en expert-assessment in het HBO: een praktijkvoorbeeld*. Lemma, Utrecht.
- Van den Tillaart, H.J.M. (1987). *Zelfstandig ondernemen: het blijft een zaak van maatwerk*. ITS, Nijmegen.
- Ward, M., Gruppen, L. and Regehr, G. (2002). Measuring self-assessment: current state of art. *Advances in Health Sciences Education*, 7, 63-80.

## APPENDIX A. SELF-ASSESSMENT QUESTIONNAIRE

1	Als het op zaken aankomt ben ik niet bang risico's te nemen	1	2	3	4	5	Als het op zaken doen aankomt dan speel ik graag op safe.	NVT
2	Belangrijke beslissingen neem ik altijd zelf	1	2	3	4	5	Belangrijke beslissingen neem ik altijd samen met partner(s) en/of maatschapsleden	NVT
3	De doelen die ik met mijn bedrijf heb kan ik niet direct benoemen	1	2	3	4	5	De doelen, die ik met mijn bedrijf wil behalen, kan ik direct benoemen	NVT
4	De ontwikkeling van nieuwe technologieën ervaar ik als een ernstige bedreiging	1	2	3	4	5	De ontwikkeling van nieuwe technologieën ervaar ik als een grote kans	NVT
5	Een goede planning is in mijn ogen niet belangrijk voor het succes van mijn bedrijf	1	2	3	4	5	Een goede planning is essentieel voor het succes van mijn bedrijf	NVT
6	Het bedrijf up-to-date houden is voor mij niet zo belangrijk.	1	2	3	4	5	Het bedrijf up-to-date houden is voor mij erg belangrijk.	NVT
7	Het imago van de agrarische producten zie ik als ernstige bedreiging	1	2	3	4	5	Het imago van agrarische producten zie ik als een grote kans	NVT
8	Het is mij niet duidelijk waar mijn bedrijf over 5 jaar staat	1	2	3	4	5	Het is mij duidelijk waar mijn bedrijf over 5 jaar moet staan	NVT
9	Het ruimtelijke ordeningsbeleid ervaar ik als een ernstige bedreiging	1	2	3	4	5	Het ruimtelijke ordeningsbeleid ervaar ik als een als een grote kans	NVT
10	Het subsidiebeleid van de (internationale) overheid ervaar ik als een ernstige bedreiging	1	2	3	4	5	Het subsidiebeleid van de (internationale) overheid ervaar ik als een grote kans	NVT
11	Het wegvallen Europese binnengrenzen ervaar ik als een ernstige bedreiging	1	2	3	4	5	Het wegvallen Europese binnengrenzen ervaar ik als een grote kans	NVT
12	Het werken in teams op mijn bedrijf vind ik niet belangrijk	1	2	3	4	5	Het werken in teams binnen mijn bedrijf vind ik belangrijk	NVT
13	Ik ben afwachtend in het vragen aan anderen (adviseurs/collega's) wat zij van mijn aanpak vinden	1	2	3	4	5	Ik vraag regelmatige aan andere (adviseur, collega) hoe zij tegen mijn aanpak aankijken	NVT
14	Ik ben gemakkelijk van mijn gestelde doelen af te brengen	1	2	3	4	5	Ik ben niet makkelijk van de doelen die ik me gesteld heb af te brengen.	NVT
15	Ik ben niet betrokken bij activiteiten die bijdragen aan een positief imago voor mijn beroepsgroep	1	2	3	4	5	Ik ben betrokken bij activiteiten die bijdragen aan een positief imago voor mijn beroepsgroep.	NVT
16	Ik draag als bedrijf weinig bij aan het uitdragen van een goed en gezond product	1	2	3	4	5	Ik probeer als bedrijf het produceren van een goed en gezond product duidelijk naar de consument uit te dragen	NVT
17	Ik evalueer mijn eigen acties niet	1	2	3	4	5	Ik probeer zoveel mogelijk mijn eigen acties te evalueren	NVT
18	Ik ga alleen zoeken naar informatie als ik een belangrijke beslissing moet nemen	1	2	3	4	5	Ik ben voortdurend op zoek naar nieuwe informatie	NVT
19	Ik geef nauwelijks feedback op het gedrag van mijn personeel	1	2	3	4	5	Ik geef gericht feedback op het gedrag van het personeel	NVT

20	Ik heb geen idee hoe mijn bedrijf het doet ten aanzien van andere bedrijven in de sector	1	2	3	4	5	Ik heb goed zicht hoe mijn bedrijf het ten opzichte van andere bedrijven doet	NVT
21	Ik heb mijn doelstellingen niet uitgewerkt in plannen op papier	1	2	3	4	5	Mijn doelstellingen zijn uitgewerkt in duidelijke op papier gestelde plannen.	NVT
22	Ik heb moeite met het aangeven van mijn sterke en zwakke punten	1	2	3	4	5	Ik ben me bewust van mijn sterke en zwakke punten en kan deze dan ook zo opschrijven	NVT
23	Ik heb moeite met kritiek van anderen (collega's, medewerkers, etc.)	1	2	3	4	5	Ik sta open voor kritiek van anderen (collega's, medewerkers, etc.)	NVT
24	Ik heb nauwelijks contacten buiten de agrarische sector	1	2	3	4	5	Ik heb veel contacten buiten de agrarische sector	NVT
25	Ik heb nauwelijks contacten met andere partijen in de keten	1	2	3	4	5	Ik heb veel contacten met andere partijen in de keten	NVT
26	Ik heb op mijn bedrijf geen communicatieplan	1	2	3	4	5	Ik heb op mijn bedrijf een duidelijk en gedetailleerd communicatieplan	NVT
27	Ik heb op mijn bedrijf niet of nauwelijks contact met burgers	1	2	3	4	5	Burgers komen regelmatig op mijn bedrijf kijken.	NVT
28	Ik houd geen rekening met feedback van burgers op mijn product in de bedrijfsvoering	1	2	3	4	5	Feedback van burgers op mijn product probeer ik mee te nemen in de bedrijfsvoering	NVT
29	Ik kan moeilijk hoofd- en bijzaken scheiden en blijf snel in details hangen	1	2	3	4	5	Ik houdt de hoofdlijnen in de gaten en kan de kern van een probleem benoemen	NVT
30	Ik neem beslissingen voornamelijk op gevoel	1	2	3	4	5	Voordat ik belangrijke beslissingen neem, informeer ik me altijd terdege.	NVT
31	Ik neem meestal geen initiatief in het bijeenbrengen van mensen uit mijn netwerk	1	2	3	4	5	Ik breng regelmatig op mijn initiatief mensen uit mijn netwerk bij elkaar	NVT
32	Ik neem minder vaak uitdagingen aan dan collega's in het vak	1	2	3	4	5	Ik neem uitdagingen vaker aan dan collega's in het vak	NVT
33	Ik onderhandel zelden met leveranciers of afnemers over prijzen waaronder we zaken doen	1	2	3	4	5	Ik onderhandel regelmatig met leveranciers of afnemers over de prijzen waaronder we zaken doen.	NVT
34	Ik probeer dingen pas uit als ze in de praktijk zich bewezen hebben	1	2	3	4	5	Ik ben vaak de eerste die nieuwe dingen uitprobeert	NVT
35	Ik vind het moeilijk feiten van meningen te scheiden	1	2	3	4	5	Ik scheid gemakkelijk feiten van meningen	NVT
36	Ik vind het moeilijk om aan te geven welke nieuwe ontwikkelingen voor mijn bedrijf belangrijk zijn	1	2	3	4	5	Ik heb goed door wanneer ik tijd moet steken in nieuwe ontwikkelingen	NVT
37	Ik vind het moeilijk om in onderhandelingen met collega's of leveranciers tot de kern van de zaak te komen	1	2	3	4	5	Ik kom in onderhandelingen met collega's of leveranciers altijd snel tot de kern van de zaak	NVT
38	Ik vind het moeilijk om problemen op de werkvloer te herkennen	1	2	3	4	5	Ik herken problemen op de werkvloer gemakkelijk	NVT
39	Ik vind het moeilijk om problemen vanuit meerdere invalshoeken te zien	1	2	3	4	5	Ik zie kan gemakkelijk relaties tussen verschillende invalshoeken leggen	NVT
40	Ik vind het moeilijk om relevante informatie te vinden	1	2	3	4	5	Ik weet waar ik relevante informatie kan vinden	NVT

41	Ik vind het moeilijk de problemen op mijn bedrijf duidelijk in kaart te brengen	1	2	3	4	5	Ik weet problemen op mijn bedrijf altijd duidelijk in kaart te brengen	NVT
42	Ik vind het niet belangrijk om bij de hoogst producerende bedrijven te horen	1	2	3	4	5	Ik vind het belangrijk om bij de hoogst producerende bedrijven te horen.	NVT
43	Ik zie voor mijzelf geen rol in het bijdragen aan ontwikkeling en/of instandhouding van natuur- en landschapswaarden.	1	2	3	4	5	Ik vind het als ondernemer belangrijk om bij te dragen aan de ontwikkeling en/of instandhouding van natuur- en landschapswaarden.	NVT
44	Ik zoek alleen naar nieuwe mogelijkheden als er een concrete vraag of probleem is (brand blussen)	1	2	3	4	5	Ik ben voortdurend op zoek naar nieuwe mogelijkheden (brandpreventie programma)	NVT
45	Meer aandacht voor dierenwelzijn bij consument ervaar ik als een ernstige bedreiging	1	2	3	4	5	Meer aandacht voor dierenwelzijn bij consument ervaar ik als een grote kans	NVT
46	Ontwikkelingen in de international markt ervaar ik als een ernstige bedreiging	1	2	3	4	5	Ontwikkelingen in de international markt ervaar ik als een grote kans	NVT
47	Samenwerking tussen ondernemers onderling vind ik niet belangrijk	1	2	3	4	5	Samenwerken tussen ondernemers in mijn sector vind ik belangrijk	NVT
48	Tijdens presentaties kan ik niet duidelijk maken aan mijn publiek wat mijn ideeën zijn	1	2	3	4	5	Tijdens presentaties kan ik goed duidelijk maken aan mijn publiek wat mijn ideeën zijn	NVT
49	Toekomstige wet en regelgeving ervaar ik als een ernstige bedreiging	1	2	3	4	5	Toekomstige wet en regelgeving ervaar ik als een grote kans	NVT
50	Wat betreft internationale ontwikkelingen wacht ik meestal af tot anderen vertellen wat ik moet doen	1	2	3	4	5	Wat betreft internationale ontwikkelingen doe ik vaak voorstellen voor nieuwe aanpakken	NVT
51	In mijn bedrijf heb ik (nog) geen functionering/ontwikkel gesprekken	1	2	3	4	5	Ik houd regelmatig functionering en/of ontwikkelgesprekken met medewerkers	NVT
52	Ik werk (nog) niet met scholingsplannen	1	2	3	4	5	Ik werk met scholings/opleidings plannen	NVT
53	Het personeel kan heeft nauwelijks mogelijkheden om tijdens werkuren cursussen of training te volgen	1	2	3	4	5	Het personeel krijgt voldoende mogelijkheden om tijdens werkuren cursussen en/of trainingen te volgen	NVT
54	Het verloop van personeel in het eerste jaar is groot	1	2	3	4	5	Ik heb weinig laag verloop van personeel in het eerste jaar	NVT
55	Ik vind het moeilijk om capaciteiten en mogelijkheden van medewerkers en anderen goed in te schatten	1	2	3	4	5	Ik kan gemakkelijk de capaciteiten en mogelijkheden van medewerkers en anderen inschatten	NVT
56	Ik vind het niet belangrijk dat werknemers hun eigen ontwikkel mogelijkheden zien	1	2	3	4	5	Ik vind het belangrijk dat mijn eigen personeel hun eigen ontwikkelingsmogelijkheden zien	NVT
57	Ik ben niet bewust een rolmodel	1	2	3	4	5	Ik ben bewust een rolmodel voor mijn medewerkers	NVT
58	Bij de planning van het werk houd ik geen rekening met de leerwensen van mijn personeel	1	2	3	4	5	Bij de planning van het werk houd ik rekening met de leerwensen van mijn personeel	NVT