Towards a Job Competency Profile for Agricultural Extension Instructors – a Survey of Views of Experts [1]

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Abstract

A project is carried out for instructors in the agricultural extension service in Esfahan. Part of the project is study, conducted to inform the process of competency profile development for the instructors. The study, reported in this contribution, focuses on views of experts about competencies needed by the instructors. The survey is based on the methodology for developing models of HRD, in which 257 key experts participated. A mix of methods was used for collecting data. The most important competencies found in this study are: subject matter and business understanding, and presentation skill. The most essential outputs are presentation of instructional materials, feedback to learners and equipping learners with new competencies after the course. In this contribution competencies and outputs are elaborated. Further research is needed regarding performance improvement as a result of the efforts of the instructors, and the views of other stakeholders on the development of the agri-clusters.

Keywords: competence, competency pofile, job profile, extension professional, HRD, agri-food sector

Introduction

In the study reported here research is carried out in the agricultural sector in Esfahan. This region has a workforce of 1,1 million persons, of which 15% is working in agriculture. Most of these persons live in rural areas and have primary education. During the last decades, the agri-food sector in Esfahan has changed significantly. The economic structure of the sector has changed, as well as its labour market. Many jobs do not exist any longer and many new ones are created. There is a large room for improvement regarding HRD. There is a considerable gap between the present and desired competencies of different professional groups in extension organizations, including instruction. Several studies have indicated that no sufficient efforts have been made towards HRM (human resource management) and HRD in the agri-food sector so far (cf. Najafi, 1991; Pezeshki-Raad, Yoder and Diamond, 1994; Chizari, Karbasioun and Linder, 1998; Karami, 2001; Pezeshki-Raad and Aghaei, 2002; Zarafshani, 2002; Karbasioun and Mulder, 2004; 2005).

Agricultural extension as part of HRD

More precisely, this study is conducted to inform competency model development for professionals in the field of agricultural extension in Esfahan. Agricultural extension can be regarded as a sub-field of HRD. Since it is quite unknown to the HRD profession, it will be described shortly.

Extension has a long history, based on adult education, communication science, community development, rural development and international development, and has strong linkages with agricultural research and practice. The old conception of extension is that of knowledge transfer;

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current views circle more around multiple stakeholder processes of cooperative knowledge construction and participatory approaches in integrated rural development, combining scientific knowledge with indigenous or local knowledge, moving from subsistence farming to entrepreneurship, including idea of multifunctional land-use (for energy production, tourism, health care, nature conservation, but also primary production and food production). Agricultural extension is a public service for human resource development of workers in the agri-food sector, including farmers (Van den Ban and Hawkins, 1996). Much of the extension services are or are being privatised. The field of extension has its own associations, conferences and peer reviewed academic journals (such as the Journal of International Agricultural and Extension Education and the Journal of Agricultural Education and Extension). Extension services have strong links with the national agricultural research organisations (NAROs) worldwide. The Consultative Group on International Agricultural Research (CGIAR) is a leading worldwide public organization in this area.

There may be a misconception about the phrase 'agricultural', since it may be exclusively associated with primary production (of vegetables, potatoes, fruits, rice, soy, flowers, plants, etc.), but the reality is dramatically different. The field of agriculture (and horticulture, fisheries, aquaculture, the dairy industry, forestry and woodworking etc.) is composed of clusters, in which chains and networks operated at a global level. Clusters exist of enterprises for primary production indeed, but also of supply industries (such as feed and seed industries), processing and packaging industries, logistic services, trade, and financial and insurance services, as well as (regional, national and international) governmental, non-governmental and sectoral organisations which negotiate market regulations, develop trade agreements, quality standards and procedures. Agricultural development is strongly related to concepts of integrated rural development,

multifunctional use of rural areas, diversification of farming and public health, but also to improving farming and sustainable development.

Agricultural extension in Esfahan

In Esfahan, the extension service is (still) a public service belonging to the Department of Agriculture. To understand the national scale of the AEI profession, it can be noted that there are about 3.5 million households in the primary sector in Iran, whereas about 2,700 AEIs are engaged in rural development. They are working for the Ministry of agriculture as part-time employees. These AEIs are distributed across 29 different provinces. On average, approximately 100 persons are working in each province. These AEIs teach in extension courses that last between two and five days in most cases. The organisation of the courses and the selection of AEIs are regulated by law, and course directors at the local level need to comply with the regulations (Karbasioun and Chizari, 2004).

The position of this study in the larger project

The study reported here fits in a project that consists of various studies. A literature study, a pilot study, and a study among farmers and studies among experts (managers and extension professionals) have been conducted to inform the process of constructing a job competency profile of the instructors. The study reported in this contribution is aimed at describing and analysing views of experts on competencies needed by the instruction professionals (AEIs). The survey is based on the methodology for developing models of HRD.

There have been attempts to develop competency profiles for extension professionals before. Shim (2005) reviewed these and developed a competency profile for the consultancy role of

extension professionals in Korea. This is especially interesting because of the fact that as mentioned, many extension services have been or are being privatised. Chizari and Mirikhoozani (1995) concluded that in general more HRD professionals, and more specifically, more AEIs are needed, and they need to become more competent to be able to more effectively contribute to performance improvement of the agri-food sector. Supporting this idea, Mulder (2001) stated that at present, HRD professionals are required to have a broad perspective and to address multidimensional client needs. He also stated that continuing competence development is necessary for professionals to stay in touch with socio-economic and technological changes. Koukel and Cummings (2002) stated that when there is a discrepancy between HRD professionals and the needs of their clients, productivity suffers. Trede and Whitaker (2000) also reiterated the fact that AEIs need to constantly develop and enhance their capabilities along with ongoing changes and challenges. They say: 'Rapid changes in agricultural technology, in planning and delivery of educational programs, and the changing structure of the farming industry clearly indicate that agricultural extension instructors and trainers need to reassess their roles and responsibility in the planning and delivery of farmers education.'

Using the development approach of the HRD models (McLagan, op cit), this project is planned to find out what future forces are influencing careers of AEIs, what roles they should fulfil, what outputs they should deliver, what competencies they need to be able to deliver those outputs, how these competencies can be developed and finally what ethical issues AEI will face in the future. Before implementing this research, two other studies were conducted to support the findings of the current study. Firstly, the developments in the agri-food sector were reviewed by questioning sectoral experts. Thereafter, farmers were asked about the changes with which they were confronted, the strategies they use to cope with these changes, the information sources they

used and the extension courses and AEI professionals. So, it is expected that given the results of these three interlocked studies and data collection through a variety of respondents such as farmers, experts, managers, and AEIs, triangulation of the data will enhance the reliability of the results and the final competency model.

The target group of the study

Extension experts have the task to support the development of workers in agriculture in various ways. One of these is to teach courses. This is done by what we call agricultural extension instructors (AEIs), and this is the target group of the project on a whole and this specific study. The reasons for choosing AEIs as the target group for this study are on the one hand their decisive role in the development of workers in the agri-food sector, and on the other hand their problems in fields like communication, teaching, motivation, being up-to date and having experience, and adequacy of their extension knowledge. Furthermore, large quantities of time and financial resources have been spent on extension courses during the last decades, but the effectiveness of those courses is not yet adequately perceived by many authorities. Evidence shows that the problem still exists and needs to be addressed. Several studies have confirmed this phenomenon (e.g. Chizari and Mirkhoozani, 1995; Chizari, Karbasioun, Linder, 1998; Karbasioun and Chizari, 2004; 2005; Karbasioun and Mulder, 2004; 2005).

For AEIs, only a few studies have been accomplished so far, and none of them is sufficiently comprehensive to cover various aspects of their job along with embracing the current and future perspectives of their roles in the agricultural extension system (e.g. Arabzadeh, 1997; Karbasioun and Chizari, 2004; 2005; Karbasioun, Mirzaei and Mulder, 2005; Karbasioun,

Mulder, 2005). In fact, this is the first attempt to implement a multi-stakeholder approach in developing a HRD model for this group of professionals in this context.

HRD

As said, agricultural extension can be seen as part of the field of human resource development (HRD) and is also considered to be extremely important to support change processes. This holds both for individuals and organizations. Organizations are increasingly aware of the fact that HRD plays a crucial role in their success and survival. Hence, many HRD models have been designed and developed to support employees and employers with implementing HRD programs, and to contribute to their performance improvement (McLagan, 1983; 1989; McLagan and Suhaldolnik 1989; Bernthal et al, 2004). In the majority of HRD models, much attention has been paid to competency profiles. Competency profile here are conceived of as linked to job profile. Job profiles essentially consist of a description of the content and structure of the profession, or job category (Mulder et al, 2005). Competency profiles consist of structured overviews of capabilities that are required for successful performance of a certain job. Competency profiles can be integrated parts of job profiles.

Towards a Competence Profile

After the initial failure of the competency approach in education in the seventies and eighties of the last century (Biemans et al, 2004), there is a renewed attention for the concept which is much stronger than before. For example, Arguelles and Gonczi (2000) have presented studies on competence-based education and training from Mexico, Australia, Costa Rica, France, New

Zealand, and South Africa. The US Department of Education (2002) has given an overview of cases on competence-based education practices. The OECD published two books, the first giving the theoretical background of competence development (Rychen and Salganik, 2001), the second being the final report of the project, in which an overarching conceptual frame of reference of key competencies is presented. The key competence framework presented in the second book consists of the visions on society, and the demands of life, that define the requirements for key competencies, interaction in heterogeneous groups, autonomous action, and interactive use of tools, based on reflective action, towards succesful life and a well-functioning society (Rychen and Salganik, 2003, 184). UNESCO also contributed to the issue of competence development. In 2004, it organized its 47th international conference on education, on quality education for all young people. In one workshop on quality education and competencies for life, a background paper was given by Frastad (2004) on competencies for life, with a description of implications for education.

An important reason to develop competency models is that they are powerful decision making tools, and can be used for self-evaluation and self-development, but also for curriculum development, course development, professional licensure, selection, staffing and even remuneration (Mulder, Wesselink and Bruijstens, 2005). Competency modelling is a highly participatory process (Stone, 1997; Stone and Bieber, 1997). Many models have been developed, for different professions.

Research questions

As has been said, the purpose of the wider project of which this study is one part, is to develop a competency profile for agricultural extension instructors (AEIs) in Esfehan. The methodology of the project is based on the research conducted for the development of HRD models (McLagan, 1989; Berthal et al, 2004). In the total project the questions are about: 1. competencies that are essential for AEIs during the next 3-5 years; 2. principal outputs for various roles of AEIs; 3. quality requirements (standards) that are essential for producing and delivering outputs; 4. future forces that influence the work of AEIs during the next 3-5 years; and 5. ethical issues that are relevant for the job performance of AEIs during the next 3-5 years. The project will result in recommendations for professional development of AEIs.

In this specific study amongst experts, the research questions are about the following topics: 1. the influence of future forces on the role of AEIs; 2. the relevance of outputs for the role of AEIs; 3. the importance of standards for these outputs; 4. the importance and required level of expertise of competencies of AEIs; 5. the relevance of ethical issues with which AEIs will be confronted. The time frame chosen from which the experts were expected to answer the questions about these topics was 3-5 years.

Methodology and data collection

As to the research methodology, it is mentioned before that the approach of the roles studies performed by McLagan (op cit) are being used in this study. Given the generic nature of these role studies, it is assumed that this methodology of competency profile research can also be employed in specific sectors.

The core of this methodology is that large groups of experts and professionals are being surveyed to assess future forces that influence the work of selected HRD professionals (i.c. AEIs), their outputs, their competencies, the standards (quality requirements), and ethical issues.

The questionnaires were adapted to the context of the study. The structure of the survey instruments was kept as carefully as possible.

Since this study concentrates on the development of a competency profile for AEIs, the role of 'instructor' was selected from the models of HRD. The questionnaires were adjusted to this role and distributed among three experts at Wageningen University and twenty-two experts of the ministry of agricultural-Jihad and also of the Ministry of Science, Research and Technology. The review and refinement of the questionnaire took three months. It helped to make the questionnaire valid for the role and context of AEIs.

Finally, the questionnaire was translated into Persian and a copy of the translated questionnaire was distributed to a group of seventeen experts in the province of Esfahan for review and improvement. This led to various clarifications in the translated draft. All ambiguities in the translation were eliminated. Much rewords and rephrasing was done to prevent misunderstanding of respondents upon completing the questionnaires. Furthermore, to assure the reliability of the items, Cronbach's Alpha Coefficients were measured for all clustered questions and as a result of the scores, some questions were deleted to keep the alpha coefficients higher than .70.

In total, 257 experts from 16 of the total of 19 townships in Esfahan were selected for this study, 100 managerial experts, and 157 expert AEIs. To make sure the participating experts were well informed, the following selection criteria were used: a minimum of five years of working

experience, teaching experience in extension courses, or research conducted or publications made about agricultural extension instruction.

The questionnaires were distributed by post to the addresses of the experts in the relevant townships. The data collection phase lasted from April until June 2005. Eventually, 184 questionnaires were returned and a number of 12 uncompleted questionnaires were eliminated. So, a total of 172 complete questionnaires were collected (=67% response), which were analysed. Descriptive techniques were used to analyse the data first. Next, the reliability of the items in the clusters of questions was tested with Cronbach's Alpha Coefficient. Finally Chi-square Tests, Spearman Rank Correlation Coefficients and Mann- Whitney Tests were performed to explore the relationships between the different variables.

The questionnaire that has been used for the expert survey consists of several categories of questions. The topics of the questionnaire are the following (number of questions for each topic is mentioned between brackets)

1. Background data of experts (such as age, gender, level of education, present position in the organization, work experience, responsibilities in the organization, level of expertise and/or experience, experience in teaching extension courses) (16);
2. Importance of future forces for the role of AEIs (18);
3. Relevance of outputs of AEIs (11);
4. Importance of standards for outputs of AEIs (89);
5. Importance and level of expertise of competencies of AEIs (28);
6. Relevance of ethical issues for the role of AEIs (14).

Results

In this section the results will be presented. First, the background of the response group will be presented.

Background of respondents

With respect to demographic characteristics of the respondents, 92% is male, 67% have a bachelor degree, 58% is between 31-40 years of age, 57% have between 5-15 years working experience, 92% have teaching experience; 64% is working as technical expert, 7.1% holds a managerial position. As to the educational background, 34% has a major in agronomy, then animal husbandry (14%) and then horticulture (11%); only 3% have major in agricultural extension. A considerable percentage of respondents are employees of agricultural extension organization (30%); 10% are in plant protection and also 10% work for the agronomy section. Considering the geographical distribution, most respondents are from Esfahan (31%), Semirom (9%), Kashan (9%) and Shahreza (8%).

Regarding the knowledge of respondents about the field of study, self assessment questions were asked about the level of knowledge in agricultural extension instruction, agricultural extension in general, and agricultural development. The average scores on these knowledge domains are 4.2

(sd=.71), 4.1 (sd=.65) and 4.1 (sd=.59) respectively. The scale used ranges from 1 (=minimum) to 6 (=maximum).

Experts were asked about the fruitfulness of extension courses for the beneficiaries, and the majority was positive about the added value of these courses (average= 4.5; sd = .79; 6-point scale used, 1=minimum; 6=maximum).

Future forces that influence the role of AEIs

A total of 18 future forces were presented to the experts. They were asked to rate these on a scale with a range of 1 to 6 (1=not important; 6=essential). On this scale, a score of over 4.5 can be regarded as very important (4=moderately important; 5=very important). Of the total number of future forces, 10 were rated on average as being very important (minimum average 4.7, maximum average 5.3) (see Table 1).

The majority of these future forces are related to content-driven change processes, such as productivity improvement, moving towards food processing and mechanization of production processes, the use of information and communication technologies by producers, the wish to join the World Trade Organization and the globalization of the agri-food market. Other future forces are profession intrinsic, such as more interactivity, variation in instructional technology, emphasizing new competencies of workers in the sector, and quality improvement of instruction. So, a wide circle of trends is seen as influential, varying from global developments, market developments, technological development, micro-economic developments, and AEI-professional developments.

When designing a competency profile for AEIs, it is necessary to take these developments into account.

Ethical issues with which AEIs will be confronted

HRD professionals all have to deal with ethical issues, such as ensuring truth in claims, data and recommendations, showing respect to others, and responsibility for accurate information that has added value for the client. This holds for both western and non-western societies, and for primary production (think of food safety and sustainable production) and services (such as not selling certain services developed at the cost of certain clients to other clients). In the agri-food complex the balance in ethically sound, and economically feasible processes is often summarized with the triple P acronym, which stands for Planet-People-Profit. This expresses the need for a sustainable agri-food sector, in which profitability is not the only criterion for doing business, but that corporate social responsibility, including smallholder integrity, is needed for the production of sufficient, safe and healthy food.

Insert Table 2 about here.

In total, 14 ethical issues were presented to the experts, who were asked to rate their relevance for the future roles of AEIs (see Table 2). Of these, the average score of 10 ethical issues was 2.5

or higher. On the three-point scale used, an average score of 2,5 or higher can be regarded as considerably relevant.

Competency needs of AEIs

To explore the competency needs of AEIs, 14 competencies were presented to the respondents. The ten competencies which rated over 2.5 on the scale are presented in Table 1. The results presented in this table are evident. The vast majority of the original competency list is perceived of as being important for the competency profile of AEIs. The level of expertise required varies between 4.7 (4=average) and 5.5 (6=maximum), which means the competencies should be mastered at a relatively high level.

It is not surprising that subject matter understanding scores highest (although the differences in importance with the other competencies is small), given the background of the experts. Presentation skills are amongst the top three competencies needed in much labour market research in general. Understanding the business of the target group is essential for providing services with added value. Most of the other competencies are specific for the work of human resource development specialists (like understanding learning processes, feedback skills, relationship building, adult training and development, and objective preparation), although they are also relevant for other development workers. These competencies should play an important role in designing programs for professional development of AEIs.

Insert Table 3 about here.

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Relevance and standards of outputs of AEIs

The respondents were asked to assess 11 outputs (see Table 2). It will be clear that outputs and competencies are related. Outputs are products or services that AEIs are expected to deliver. Competencies are the capabilities of AEIs to deliver those products and services. So, presentation of instructional materials as on output requires presentation competence.

Insert Table 4 about here.

The relevance of the outputs given to the respondents is evident. All eleven outputs are rated on average as between 2.5 and 2.9 on a 3-pointscale (1=not relevant; 2=slightly relevant; 3=very relevant).

A large number of standards (between 6 and 11 for each output) were distinguished. Examples of these standards are:

For presentation of instructional materials: the extension facilitator makes adaptations in using instructional materials according to the unique issues of the farmers' group (level of education, age, culture, interests); instructional material used for teaching is updated and according to new

scientific achievements; the learning point are clear, accurate, and organized. For feedback to learners: feedback is supported by specific, practical and understandable examples; it is given in a respectful manner to the farmers, according to adult education principles; it can be used to make on-the-job behavior changes. For equipping farmers with new knowledge, skills, and attitudes after the course: after finishing the course individuals are able to apply new learning; individuals are able to perform learnt issues in the farm practically; farmers are able to produce more products (quantitatively and qualitatively).

Cronbach's alpha coefficients for each output were measured, and varied between .70 and .88. The importance of all standards varied between .7 and .8 (minimum=0; maximum=1). This means they are all viewed as being important.

Conclusions

The intention of the project is to inform competency profile development to direct and support professional development of AEIs in Esfahan. It is expected that the methodology used can be used to scale the study up to national level and even to other sectors and professions. The introduction of small scale, in-depth interviews with selected key experts will add to the quality of the study, as has been shown in other research (Mulder, Wesselink and Bruijstens, 2005). The most important purpose of a large scale survey is to reassure the trustworthiness of the final profile. But a limited number of targeted in-depth interviews reveal the majority of the competencies needed already. This observation is confirmed in this project too.

In this study, a representative number of experts have given their views on future forces that influence the role of AEIs in the near future, ethical issues with which they will be confronted, the importance and level of expertise required of AEIs, and outputs that need to be delivered by AEIs.

The questionnaire used was based on other HRD model studies (McLagan, op cit). The draft questionnaires were reviewed and criticized by various experts, and the final version was a result of extensive evaluation and redesign. But this process paid off, since it is evident that most of the elements included in the questionnaire were rated as being important. The vast majority of the contextual factors, such as various content-related and profession-oriented developments, views on ethical concerns, statements about required outputs and the list of competencies is regarded as being important. So, the information of this study can very well be used during the deliberation process that will take place to decide upon the competency profile. Studies with other perspectives, such as interviews with the recipients of the services of AEIs, which is also implemented, will be used to triangulate that data of the total project.

The next step is to design effective professional development programs for AEIs. Based on other research it is know that formal courses alone are probably not sufficient or the most effective for the development of AEIs (Lans, Wesselink, Biemans and Mulder; 2004; Karbasioun, Mirzaei and Mulder; 2005). So the challenge is to design learning trajectories in which competencies will be developed that are relevant for delivering added value for the recipients of the service of AEIs. We think a combination of formal and informal professional development may be most effective. This should be supported by appropriate measures at the level of the extension

organisation and human resource management of extension personnel (Karbasioun and Mulder, 2004a)

Important elements of the competency profile of AEIs, based on this survey amongst experts, are content-related competence, and instruction-related competence. Both need to be addressed in the professional development program that will be designed, especially because the data showed that most of the AEIs are agricultural experts in stead of extension experts. The present list of competencies, together with the importance and expertise ratings, can already be used to design self-assessment tools for existing AEIs. In a later stage the competency requirements can be further formalized, eventually for professional licensure, if this is desired by the actors involved.

A couple of cautionary words should be added here regarding the use of competency profiles in professional development and education. It is beyond the scope of this contribution to elaborate too far on this, but there is quite a lot of debate on the concepts of competence, competency, the relationship between competence and knowledge and skills, the context-bound meaning of competence, the relationship with standardization and harmonization of education (especially in the European Union, related to the Lisbon, Copenhagen and Bologna processes on enhanced cooperation, the realisation of one education space, and transparency), and the implementation of competence based education in practice. Recent publications (see Biemans et al, 2004; Kuchinke, K.P. & Han; Wesselink et al, 2007; Weigel et al, 2007; Mulder, 2007; Mulder, Weigel & Collins, 2007; Mulder, Lans, Verstegen, Biemans & Meijer, 2007; Brinkman et al, 2007) have addressed these issues and point at emerging multi-dimensional, holistic and blended models of job-related, cognitive, behavioural and attitudinal competencies (Delamare Le Deist &

Winterton, 2005). Various authors mentioned also stress that developers of competence models should be aware of the problems that come with the concept, but also showed ways to handle and overcome these problems. Further research has to show as to whether this approach is also beneficial for the end users of the extension service: the rural population in Esfahan

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Table 1. Assessment of future forces by experts.

Future force	F[1]	R[2]	M[3]	SE[4]	SD[5]
1. Increased emphasis on the need to improve the capability and productivity of farmers	165	1	5.3	.06	.82
2. Increased need for active interaction with farmers that necessitate changing traditional styles of instruction to new interactive and practical approaches	166	2	5.2	.07	.97
3. Increased sophistication and variety in instructional technology (using instructional tools, methods and media)	168	2	5.2	.07	.88
4. Developing and supporting industries related to agriculture such as food processing and mechanization technology	168	3	5.0	.08	1.05
5. Increased use of computers and internet for consulting, supervising, managing and educating farmers by extension organizations	167	4	4.9	.08	1.11
6. Increased use of computers and internet by farmers in their activities	166	5	4.8	.08	1.06
7. Joining to world trade organization (WTO) and commitment to compliance with its principles and conditions	166	5	4.8	.08	1.09
8. Emphasis on new competencies of farmers like creativity, risk taking, adaptation to change, teamwork and sensitivity for their environment	166	5	4.8	.07	.96
9. Globalization of agricultural activities and tasks, like increased and expanded international co-operation and communication, joint ventures, overseas ownership, and international competition	166	6	4.7	.08	1.11
10. General expectation of quality improvement of agricultural instruction	167	6	4.7	.07	.91

[1] Frequency of respondents
[2] Rank
[3] Mean 1=not important; 2=very little important; 3=little important; 4=moderately important; 5=very important; 6=essential
[4] Standard Error
[5] Standard deviation

Table 2. The extent to which AEIs will be confronted which ethical issues according to experts

Ethical issue	F[1]	R[2]	M[3]	SE[4]	SD[5]
1. Ensuring truth in claims, data, and recommendations	167	1	2.8	.03	.37
2. having commitment for delivering an effective course for farmers and help them as much as possible to be aware of new changes in their environment and farm	166	1	2.8	.03	.36
3. Showing respect to farmers in all circumstances	167	2	2.7	.04	.49
4. Feeling responsibility for collecting the newest and practical information and giving to farmers in extension courses	168	2	2.7	.03	.46
5. Being available for farmers and solving their difficulties after finishing the course so that the farmers can use taught appropriately	168	2	2.7	.04	.52
6. Avoiding conflicts of farmers' customs, expectations and needs	167	2	2.7	.04	.49
7. Balancing organisational and individual needs and interests	167	3	2.6	.04	.57
8. Showing respect for, interest in, and presentation of individual and population differences	167	3	2.6	.04	.51
9. Being sensitive to direct and indirect effects of intervention and acting to address negative consequences	166	4	2.5	.04	.56
10. Ensuring farmer involvement, participation, and ownership	167	4	2.5	.04	.58

[1]: frequency of respondents
[2]: Rank
[3]: Mean 1=not relevant; 2=moderately relevant; 3=considerably relevant
[4]: Standard Error
[5]: Standard deviation

Table 3. Importance and required level of expertise of competencies of AEIs

Competency	Importance		Level of expertise	
	M[1]	SD[2]	M[3]	SD[2]
1. Subject Matter Understanding: Knowing the content, importance and feasibility of a given function or discipline being addressed	2.8	.45	5.5	.96
2. Presentation skill: Presenting agricultural information orally and in a suitable way to farmers so that the intended purpose is achieved	2.7	.47	5.2	.91
3. **Business Understanding** : Familiarity and understanding various aspects of farming, characteristics, difficulties, sensitivities and challenges in agriculture	2.7	.45	4.7	.96
4. Learning Understanding: Knowing how adult farmers acquire and use knowledge, skills, attitudes; understanding individual differences in learning	2.7	.48	4.9	.90
5. Feedback Skill: Communicating information, opinions, observations, and conclusions so that they are understood and can be acted upon by farmers	2.7	.52	4.9	1.03
6. Intellectual Versatility: Recognizing, exploring, and using a broad range of ideas and practices; thinking logically and creativity without undue influence from personal biases	2.7	.49	4.9	.88
7. Relationship building skill: Establishing relationships and networks across a broad range of farmers	2.6	.50	4.9	.95
8. Self-knowledge: Knowing one's personal values, needs, interests, style, and competencies and their effects on others	2.6	.54	4.9	.96
9. Adult training and Development: Understanding theories and techniques used in training and development for farmers	2.6	.57	5.2	1.13
10. Objectives Preparation skills: Preparing clear statements which describe desired outputs for farmers	2.5	.55	4.7	.97

[1] M=Mean for importance: 0=Not important; 1=Little important; 2= moderately important; 3= very important
[2] SD=Standard deviation
[3] M=Mean for level of expertise: 1= nothing; 2= very little; 3= little; 4= average; 5= much; 6= very much

Table 4. Importance of outputs of AEIs

	Output	M [1]	Sd [2]
1	Presentation of instructional Material	2.9	.35
2	Feedback to learners	2.8	.35
3	Equipping farmers with new knowledge, skills, attitudes after the course	2.8	.62
4	Using teaching methods and delivery of instructional materials	2.8	.39
5	Encouraging and managing individual action plans for learning transfer	2.8	.45
6	Facilitation of media-based learning events (such as videotapes, films and audio-tapes	2.7	.43
7	Facilitation of farmers' group discussion sessions	2.7	.46
8	Supporting learning environments	2.7	.50
9	Test delivery and feedback	2.5	.53
10	Facilitating group members' awareness of their own group process during the group discussion sessions	2.5	.55
11	Facilitation of structured learning events for farmers (such as case studies, role-plays, games, simulations, and tests)	2.5	.57
	Average	*2.7*	

[1] M=Mean for importance: 0=Not important; 1=Little important; 2= moderately important; 3= very important
[2] SD=Standard deviation