THE STATE OF AGRICULTURAL HIGHER EDUCATION – DISTINCTIVE TENDENCIES AND CHALLENGES

THESIS OF THE DOCTORAL (PhD) DISSERTATION

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INTRODUCTION

In the process of determining my research topic several facts played crucially important roles including the fact that on the basis of my belief and my educational experience acquired at Károly Róbert College I attach great importance to the development of human resources in rural areas and in connection with this to agricultural higher education in harmony with the actual requirements of the labour market. In this process great responsibility falls on rural higher educational institutions.

The issue is especially important for rural colleges because the number of candidates and students has constantly been decreasing since 2004 and according to demographic forecasts a further decline is expected. Because of the unfavourable demographic processes and the recent application system the power of absorption of the higher education institutions in Budapest and in larger cities is becoming increasingly powerful. The survival of rural colleges and the improvement of their competitiveness can only be guaranteed if they manage to continuously modify their curricula, education methods and approach according to labour market requirements.

The Purpose of the Research
The primary purpose of my research is to analyse the competitiveness of higher education in rural areas by way of economic analysis. My indirect goal is that my research could be a base for further labour market analyses that support a more efficient human resource management through the improvement of the quality of higher education.

As a result of the examinations it is now possible to determine the scope of knowledge, skills, and competences that are indispensable for the improvement of the competitiveness of fresh graduates in the labour market. The analyses facilitate the creation of new, competence based materials and educational models that involve existing and prospective employers and at the same time are able to react to the challenges of the labour market more flexibly.

I believe it is important to formulate recommendations that do not exclusively improve the competitiveness of agricultural higher education.

During research my principal aims were as follows:

- The primary aim of my research was to thoroughly analyse the national and international literature considered necessary for carrying out the research and by the help of which I could introduce the international
trends that are important and relevant for the Hungarian agricultural higher education.

- Another aim was to highlight the expectations of the labour market towards the students who are currently studying in the BSc system. Presently there is not enough labour market feedback about the two-tier educational system, nevertheless it is indispensable to analyse the new system so that long-term recommendations could be made.

**My fundamental assumptions in connection with the above mentioned aims are the following:**

**H1:** The agricultural higher education is utterly important from the point of view of making the best use of the Hungarian comparative advantages. In order to improve the competitiveness of Hungary and to overcome the current economic crisis it is essential to have a modern higher education system.

**H2:** The graduates of the agricultural higher education institutions do not get employed in agriculture thus there is an important lack of expertise in the sector.

**H3:** Neither the composition of the subject materials of agricultural higher education nor the educational methods adjust to the requirements of the labour market and beside expertise the so called “soft” competences, which are not adequately dealt with in the present system, are also utterly important.

**H4:** In the new, two-tier educational system there cannot be determined a clear division concerning the aims and requirements between the BSc and MSc levels. It is especially disadvantageous for the agricultural higher education since the BSc level cannot be adequately practice oriented.

**H5:** There is only a superficial relationship between the educational institutions and the enterprises thus students are not sufficiently prepared. This decreases the chances of undergraduates to find employment after graduation and has a negative effect on the competitiveness of agriculture as well.

**H6:** Language skills are indispensable for agricultural students from the point of view of labour market competitiveness. Entrants do not have acceptable language skills, which prevents them from participating in international programmes.
MATERIAL AND METHOD

Secondary research

During the review of the national and international literature special emphasis was laid upon works dealing with the economic aspects of education especially with the roles of labour market. Literature on the training of human resources in agriculture as well as on rural development was considered to be important basis for my work. Apart from the above mentioned activities during my literature review I also analysed and compared international articles, conference handouts, and other publications.

Primary research

The necessary information was gathered by way of questionnaire surveys and personal in-depth interviews.

The primary research was carried out at Károly Róbert College, in Central Agricultural Offices and amongst agricultural enterprises operating in the Gyöngyös micro-region. The research primarily focused on agricultural education therefore the basis of the analysis was formulated by the assessment of students’ questionnaires.

Beside the usual data collection amongst students who graduated between 2004 and 2009 I deemed it necessary to interview both employers and former professors because the data obtained from various sources enabled me to better compare opinions which has lead to more thoroughly based conclusions.

The introduction of the methods of the primary research

Single variable methods

The following calculations were made by means of single variable analysis:

- partitioning
- mean
- standard deviation
Multi-variable methods

Of the multi-variable methods applied during the quantitative research mainly nonparametric tests were used. A special group of nonparametric tests consists of methods based on ranking. These methods proved to be the most suitable for the examination of my hypotheses. Of the ranking based methods the following have been applied:

- Mann-Withney test (Wilcoxon rank-sum test)
- Kruskal – Wallis test
- Kolmogorov-Smirnov test
- Spearman's rank correlation coefficient
- Canonical correlation analysis
INTRODUCTION OF RESEARCH OUTCOMES

Graduated students about agricultural higher education

The basis of my primary research consists of the opinion of students who graduated from Károly Róbert College in agricultural sciences between 2004 and 2009. I considered it was necessary to compare the opinions of students who studied in the old college system with that of students who studied in the new Bologna system.

The assessment of the conditions of study

I assumed there was a difference between the opinions of the students who studied in different educational systems.

In order to support my hypothesis I applied the two independent variable Kolmogorov-Smirnov test delineated in the previous chapter.

Table 1: Difference Examination by Kolmogorov-Smirnov Test

Source: own calculation
Differences below 0.1 can be considered significant. Table 1 reveals that there exists a significant difference in ease of attainment. If we compare the average results of the two groups, it becomes obvious that on a 1-10 scale students in the Bologna system consider the time allotted for acquiring the subject material worse than their counterparts studying in the old college system. In my opinion in the new educational system the time allotted for training has been cut but the subject material has remained intact. As a result the subject material designed for 8 semesters must now be acquired in only 6 semesters by BSc students. A shorter training period does not allow a more thorough acquisition of the material.

It is important to assess the harmony between theory and practice. There is a significant difference between the former and the new educational systems in this respect as well. Similarly to the previous case BA students had a more favourable opinion. The reason for the difference is again the shorter training time since due to the dense theoretical requirements the practice periods cannot properly live up to expectations.

Students in the BSc system had a more positive opinion about the possibility to acquire scientific methods as well as the preparation for professional work.

However, it is worth considering the fact that the BSc students gave lower marks for the use of electronic communication devices. In my opinion it is because despite the large-scale recent investments in infrastructural development the role of modern info-communication devices in education is still negligible. In order to improve the situation it would be important to offer further training for teachers.

The assessment of educational aims and requirements

A rating scale has been used to analyse the connection between educational aims and requirements. The answers of the students studying in the former educational system were grouped according to whether the respondents had continuous employment during their studies.

Those who were employed gave more positive responses in general to the questions concerning educational aims and requirements. They only gave more negative answers about active student participation. The explanation for this trend is that students with a job usually obtained their degree either in correspondent or distant education thus they spent less time in classes.
A correlation examination was also carried out in connection with educational aims. I examined whether the answers given to each question within certain question groups were related.

Table 2 Spearman's Rank Correlation Coefficient Examination

<table>
<thead>
<tr>
<th>Source</th>
<th>The study and examination requirements are accurately determined</th>
<th>Lectures and seminars are in harmony</th>
<th>Specialisation within the major is possible</th>
<th>The educational and training purposes are obvious for students</th>
<th>The subject material fulfills labour market requirements</th>
<th>Students may actively participate in research/practice projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.378(+)</td>
<td>.339(+)</td>
<td>.259(+)</td>
<td>.259(+)</td>
<td>.259(+)</td>
<td>.259(+)</td>
</tr>
<tr>
<td>N</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: own research, 2010

The assessment of foreign language teaching

During my research the role, the importance and the quality of foreign language teaching were also examined.

A basic condition for participation in scholarship studies abroad is an acceptable level of language skills; in addition, employers also consider the language skills of prospective employees.

I compared the opinion of the students who graduated from the two different educational systems having supposed that there would be a difference between the two groups. It must be noted that foreign language education was considered to be important by all the respondents regardless of the
educational system and whether they were employed during their studies or not. Students from either systems believed that a high number of language classes, communication focussed teaching, and a language certificate were all necessary. The greatest difference appeared in connection with business language learning.

The importance of certain types of knowledge and skills in the labour market

The questionnaire contained 18 types of knowledge and skills that are important in the labour market in my opinion. The results were analysed for the two different systems separately and cumulatively as well.

Figure 1 reveals that there is little disparity between the answers given by students studying in different educational systems. Graduates of the old college system considered the following items less important: scientific method, foreign language skills, special professional knowledge, broad economic knowledge, and the oral expressive skills.
Graduates of the new Bologna system, with a somewhat smaller difference, considered the following items less important: organisational and negotiation skills, computer literacy, and conflict handling. However, the means do not reflect the standard deviation therefore I turned to the Kruskal-Wallis test in order to be able to prove the differences.

Beside the importance of the different types of knowledge and skills I also enquired about which of the above mentioned types of knowledge and skills the freshly graduated agricultural experts have according to their own judgement.

Graduates of the old college system – based on their own self-assessment – possess the required skills and knowledge to a greater extent than their counterparts who studied in the new Bologna system.

![Figure 2](source: own research, 2010)

**The assessment of the training**

I presumed there were connections between the existence of skills and the success on the labour market. (questions 1.12 and 1.14 in the questionnaire) I believe that the respondents who adequately possessed skills listed in section 1.12 in the questionnaire considered themselves successful in the labour market.
On the basis of the research it can be stated that there is only a weak connection between the success in the learning process and the possessed skills at graduation. However, the correlation analysis proved that there is a connection between later stages of one’s career and their problem solving skills, organisational skills, the ability to work independently, and the written expressive skills. This result also supports the argument that it is important to improve the above mentioned skills in order to boost chances in the labour market.

The role of professional practice

This question has been analysed from different angles on the basis of the responses. The answers of those who completed their studies in the old college system were analysed on the basis of whether the respondent was employed during the college years or not.

The outcomes reveal that those who were continuously employed during their studies were assigned tasks relevant to their profession and their work experience contributed to finding suitable positions. Those who were not continuously employed during their higher level education were much less likely to have concrete tasks during their professional practice.

On the basis of the responses it can be stated that in the case of the new Bologna system the professional practice contributed more to finding suitable employment than in the case of the old college system. It must be noted, however, that amongst those who graduated earlier there are a number of professionals who are not employed in agriculture thus their responses must have been influenced by this circumstance.

The essential know-how to success in the labour market

Foreign language skills are considered important in both educational systems. The opinions are also similar about marketing.

At the same time marketing was marked important significantly less times than foreign languages. Agricultural professionals who graduated from the old college system thought that legal knowledge as well as finance and accountancy skills were more important. It is notable that those graduated from the new Bologna system considered economic studies more important.

The difference between the responses of the two goups was proven by Mann-Withney test.
The employers’ opinion about agricultural higher education

The sample of employers contained 14 Central Agricultural Offices and 36 agricultural enterprises of different sorts. Considering its size the sample cannot be taken as a representative one but I believed it was important to analyse the opinion of the employers in order to better justify the research outcomes.

The most important skills that enterprises expect professionals to have are the ability to work independently, cooperation, broad basic knowledge, and conflict handling. At the same time lower marks were given on foreign language skills, scientific methods, and written expressive skills. Foreign languages are considered less important by enterprises because during the daily routine they do not get in contact with foreign clients and there is no demand for it either. As for scientific methods it can be stated that the enterprises I contacted do not apply the latest scientific methods. This unfortunate fact is in connection with the problem of training, which was explained beforehand. In order to complete application forms and written documents enterprises usually to external sources thus written expressive skills are not important for them in their work.

![The Importance of Knowledge and Skills for Employers](image)

Figure 3
Source: own research, 2010
Tutors about the agricultural higher education

Most tutors believe that the greatest problem is the low profitability of the agricultural sector. There may be a link between this fact and the low motivation of students.

A further problem is presented by the insufficient preparedness of the applicants. This holds true for higher education as a whole but there are differences among disciplines.

It can also be added to the above mentioned facts that students unfortunately lack basic skills and higher education institutions must also deal with such problems.

Tutors indicated that in their opinion the most important skills are problem solving and conflict handling. Verbal expressive skills, creative thinking, and the ability to work independently are also ranked high. Tutors also believe that a well prepared professional must have broad economic knowledge (economics, finance, marketing, law) beside the necessary specialist knowledge.

Both the tutors and the employers mentioned that skills that are especially important for success in the labour market (problem solving skills, ability to work independently, foreign language skills, verbal expressiveness) are insufficiently developed.

Figure 4
Source: own research, 2010
Most of the interviewed tutors judged that as a result of the two-tier educational system the **training time in the first tier (BSc) has become far too short and the lack of time hinders the acquisition of basic skills, there is no time for the implementation of practice focused training nor for talent support.** The division of the “levels” has not been completed. This fact greatly contributed to the institutional competition in that all the institutions train students at all levels even if there are not sufficiently equipped and prepared. The training objectives and the connected requirements are not clear and as a result BSc subjects are re-taught at MSc level. At the same time tutors expressed opinions that the Bologna systems allows the training programmes to more flexibly adjust to European expectations, which boosts competitiveness.
NEW SCIENTIFIC RESULTS

1. Agricultural higher education in the current system is not sufficiently practice oriented thus the training of fresh graduates in this respect is inadequate. There is a lack of teachers with experience in competitive production working in agricultural higher education. This result supports hypothesis 5 (H5).

2. Agricultural higher education is characterised by institutional „over-proliferation”, which significantly decreases the competitiveness of agricultural higher education. A more concentrated training supply is required both at BSc and MSc levels. Majors should only be taught at institutions where the necessary infrastructure (educational works, training farm) can be found and is operating properly. It must be mentioned that consensus has not yet been achieved in this question. On the basis of this observation hypothesis 4 (H4) can be considered justified.

3. The quality and efficiency of agricultural higher education must be improved before long as properly trained experts in this field are indispensable for the improvement of the competitiveness of Hungarian agricultural enterprises and thus for our future. Entrants in this sector lack crucial skills such as problem solving, creativity, oral expression. As a result hypotheses 1 and 2 (H1, H2) are justified.

4. The Bologna process improves student and teacher mobility but it must be supervised in a number of other respects. BSc education has become more theoretical thus it cannot satisfy either the practise oriented requirements of these majors or the demands of the labour market. Participation in international training and scholarship programmes, R&D projects, in scientific events or the establishment and maintenance of international connections for enterprises cannot be viable unless the students, the teachers, and the experts possess sufficient language skills. This result partially justifies hypotheses 3 (H3) and 6 (H6).
CONCLUSIONS AND RECOMMENDATIONS

On the basis of the national and international publications and research it can be stated that **the high standard professional training of agricultural experts is indispensable**. The rapidly changing economic environment increases the value of broad economic knowledge. **Apart from the high standard professional training the institutions must pay more attention to skills such as problem solving and creative thinking.** Practice oriented training at BSc level must be urged. It is important to popularize professional practice programmes and to involve enterprises in the educational process.

There is an especially strong call for the qualitative restructuring of the agricultural higher education system in Hungary. In order to achieve this **an agricultural strategy is necessary which can be the basis of training programmes in the long run.**

My suggestion is that a higher education institution would be allowed to launch or continue agricultural training programmes only if they can fulfil all the **requirements on assets and human resources**, and also that the labour market position of graduated professionals justify their raison d’être. Assets in this context refer to modern educational infrastructure, training farms, and research institutes which support competitive theoretical learning as well as hands-on experience about state of the art technology for students.

Bearing in mind that the development of such circumstances in the current financial situation is strongly restricted during the accreditation process the availability of the suggested conditions as well as the possibility to involve external sources should be examined, however, it is obvious that the existence of own training farms and research institutes is a priority factor.

In respect of human resources requirements the involvement of both the successful professionals working in production and the qualified tutors working either in education or in research is necessary. Tutors must pursue scientific publication and presentation activities, while the use of foreign language(s) in this field and if possible in the educational process would also be preferable.

Since an active research and publication activity cannot be demanded from everybody institutions must be able to provide regular attendance in training programmes, conferences, or in workshops.
In order to boost competitiveness the renewal of agricultural higher education in respect of content and methodology is also necessary. The interviewed former students were pleased with the subject matter as a whole but their opinion differed about its ease of attainment. The shorter training time does not allow the careful acquisition of the subject matter thus it remains superficial. Furthermore there are not any chances for deeper professional specialisation. A solution may present itself if workshops and scientific student conferences are turned into real professional events.

A new methodological approach is necessary that better motivates or even compels students to actively participate in the educational process. Seminars and professional practices may be the ideal place for students to master abilities and communication skills and during this process a greater emphasis has to be put on personal communication based pedagogical work especially at BSc level. It requires the revision of the methodological awareness of the tutors and if needed methodological-personality trainings will have to be organised.

In order to enable the agricultural higher education to contribute to the improvement of the competitiveness of the Hungarian economy the agricultural education must gradually be turned into practice oriented training. It means that the role, the length, and the diversity of the content of the professional practice must be increased in higher education especially at BSc level.

To achieve this the number of potential practice sites will have to be increased and it is unlikely that individual institutions will be able to serve this purpose therefore an educational and agricultural sectoral cooperation must be created.

The content of the final requirements must also be revised in a way that the professional practice is assessed both at the site where it is completed and also in the educational institutions. Emphasis should be laid not on the administrative side of its completion but on real professional aspects and if necessary it must be monitored as well.

Professional practices abroad must be popularized because in this way students may gain professional and other experience which would be impossible or very difficult to achieve in this country and that during the job search process could provide advantages.
Foreign language education must be included in both the BSc and the MSc curricula but in different ways. At BSc level communication based language learning must be the centre completed with a basic level business language education which would prove useful at fairs and exhibitions and could facilitate the revision of the professional literature.

At MSc level language classes are also necessary precisely because it would enable student to actively participate in foreign language professional seminars. Students should be allowed to defend their thesis in a foreign language.

The basic condition for launching foreign language professional seminars is the suitable language skills of the tutors. Institutions must pay special attention to the foreign language skills of their tutors if they want to be competitive since without suitable language skills the teaching activity, literature review, and the opportunities for personal development will be significantly restricted.

For the sake of the success of the Bologna system it must be made obvious that the BSc level as the first tier in the system must be adjusted directly to labour market requirements. What it means for agricultural higher education is that teaching basic skills must not take its toll on professional practice. The MSc level as the second tier cannot dispense with professional practice but focus should shift to theoretical knowledge, higher level management, and preparation for research activities.

Together with employers the range of professions that require BSc and MSc level education must be determined. This base must establish the place of these two levels in the labour market in the medium term amongst the strategic economic and social aims.

The current suggestions can be considered as the completion of the monitoring of professional promotion with the determined aim that it allows data collection about characteristics of the teaching process, its positive or negative effects, and also about its strengths and weaknesses based on the supposedly different preferences of the active participants and beneficiaries.

These measurements should be made not only in the agricultural sector but also in other disciplines as well. These analyses could provide adequate information about where and what kind of alterations should be made in education, and about their extent.

Naturally everybody will gain if the results are based on reliable data and there is real commitment for their implementation.
Therefore it seems necessary to analyse the experience gained from career monitoring so far from the point of view of the respondents and the regulations made on the basis of the already collected data, however it is only partially the task of individual institutions since the summarised conclusions may become compulsory rules through governmental decision making processes.

My aim was to provide a full scale revision of the current state of the agricultural higher education nevertheless due to the extent of the research, the great number of the involved institutions and the restricted research competences the work cannot be considered completed.
LIST OF PUBLICATIONS

Articles published in Hungarian journals:


Articles published in foreign-language journals:


Papers published in conference issues


Book chapters


Other