VOCATIONAL DISTANCE LEARNING OF AGRICULTURAL SCIENCES IN THE EU AND COMPARATIVE STUDIES WITH THE UK, GERMANY, AUSTRALIA AND THE U.S.A.

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Abstract: *Lately, we have been witnessing a very intense promotion of a certain form of education, learning and training called open distance learning. This phenomenon makes necessary clarifications both at a conceptual and a practical level. It seems that its methods are approved by a large number of participants in the educational process. Hence, we try to look at things from a global perspective.*
This summary is intended as a review of the development of the vocational distance learning, especially in agricultural and biological sciences in the UK and Germany, seeking and making recommendations for future actions in Romania, Slovenia and Bulgaria.

Key words: *vocational distance learning, „learn direct", „e-learning", „e-teachers", tutorial system, instructional-educational process.*

I. JEL CLASSIFICATION: I20, I21

1.1. Historical and cultural perspectives of vocational distance learning, especially in the field of agriculture and biological sciences

This paper is an analysis of the evolution and impact of all types of distance learning. Distance learning is not a new phenomenon; it appeared at least 100 years ago, representing a form of teaching and learning. The printed educational material was distributed by mail. Due to the increased interest in electronic training or 'e-learning' in recent years, a rapid progress in electronic educational programs has been registered through the development of internet and e-mail. This report analyzes these media of transmitting the information.

Also, each European country has a different educational system regarding the access to education, the way of financing it, as well as the students' participation (as individuals, supported by employers or by the public systems). Such systems have been developed following discussions between employers, government agencies, educational institutions, accreditation authorities and trade unions. For example, in Germany, these systems are very well organized. Students can attend distance courses, developing their skills, but they do not need to work in a field requiring professional mobility. Distance courses are also designed for a number of contextual issues. Many employees are satisfied with their professional performance and it takes much persuasion for them to understand that such courses can improve the already existing system.

The European Union wants its citizens to know and to use electronic means in order to develop their skills. There are government initiatives which promote IT and e-education in all Member States. In the UK, the government supported the 'University for Industry'. This initiative adopted the method 'learn direct' (direct education) to provide additional training through modern technology and learning centres and to ensure conditions of individual development those who had just learnt a particular job. In Germany, the federal educational authority conducted a series of initiatives to

support both the development of quality standards in the field of electronic education and the optimal methods of the training systems.

1.2. Definitions of distance learning

The term distance learning refers to those teaching and learning methods in which teachers and learners are separated by physical space, but communicate through various means. For this type of education, there is an educational institution that organizes, facilitates and evaluates the educational process. Distance learning is a broader concept. The term refers to the use of materials or the teaching means used by the students who are not necessarily related to an educational institution or are employed in direct communication with a teacher. Distance learning may be the result of distance learning processes, but it may take place without an active relationship between those involved in the instructional-educational process. (McLean, 2001).

The essential means generally used by distance learning are printed materials, audio and video tapes, radio and television, teleconferences, training with computers and computer conferences. Depending on the context, each of these methods has advantages and disadvantages. It is necessary that the selection of the appropriate means for a particular teaching initiative to reflect the aims of the educational process and the study activities, the characteristics of the learners and their environment, as well as the economic and organizational feasibility of various options.

The general principles (Truelove, 1998) are:
• The teacher and the students are separated by physical distance;
• The teaching materials are structured in sequential order to facilitate self-study;
• The means (audio, video, printed materials) are used to exchange teaching materials, sometimes together with the method of direct communication (face to face);
• There is a specialized educational institution.

Distance learning environments vary in terms of:
• The level of interaction between teacher and students;
• The level of interaction among students;
• The type and degree of use of a particular means.

Distance learning programs can be: formal (performed as part of an accredited institution) or non-formal. The form of distance education can provide an entire course (at the end of which one can obtain a title or a diploma) or independent courses within a larger program (Truelove, 1998).

The differences between open and distance education are getting blurred as the teachers introduce more and more electronic materials in conventional courses (Cook, 1998).

II. THE CURRENT AVAILABILITY AND USE OF VOCATIONAL DISTANCE LEARNING, INCLUDING E-LEARNING, IN AGRICULTURE

2.1 A review of the situation in the UK

2.1.1. How it emerged and developed

By the late '70s, printed materials, radio and television were the main technologies available for distance learning. Since the '30s, in Great Britain there were professional courses through correspondence in agriculture and horticulture. An example is the Horticultural Correspondence College, a private institution offering courses in horticulture, gardening and agriculture. In general, the teaching materials are texts of the studying units, accompanied by sets of questions. The student reads the printed material, the recommended bibliography or obtains additional material and sends his/her answers. They are read and marked by a specialist tutor, who, within a few weeks, has to send the student his/her paper and the mark, along with a letter with comments, a model of the expected answers and a set of standard answers. In Great Britain, radio is still widely used, both as a tool for distance learning and traditional. Also, distance education is based largely on audio and video tapes, enabling the student to use them whenever s/he wishes to.

The creation of computer-mediated communication (CMC) opened a door for electronic conferences facilitated by the experience of a virtual teacher and a virtual class. This technology can be found in universities and colleges, as it increases the number of students, as well as in private institutions offering training courses. However, this method is still recent, so that we will take into account the traditional forms used in distance learning (printed materials).

It is believed that electronic education is the main form of instruction for those who do not have time to study in a specialized institution, with full attendance or part-time. The courses include professional and specialized disciplines. Of these, the most important are: accounting, transport, public relations and business services, IT. However, in Great Britain, there are few electronic distance education courses in agriculture.

In distance education, agriculture is a very difficult discipline in terms of teaching because, if the theory can be taught at distance, agriculture is a particularly practical discipline, requiring a material basis (land and specialized equipment). Also, crops, animals, machines and facilities vary from one farm to another even in the same region, and thus it becomes difficult to teach a unique course. In addition, as farmers are isolated and, in many cases, they do not have individual studying skills, it can be difficult to maintain motivation in the absence of their contact with the tutors or other learners (Cook, 1999).

Despite these difficulties, some analysts believe that in the near future the overall demand for distance courses will increase in agriculture in particular. Compared with day learning, distance learning may provide an alternative, which is financially profitable, because it eliminates the costs with travel and accommodation, and studying can be done in parallel with daily activities (Truelove, 1998).

Distance learning offers an alternative for those working in agriculture and who are forced to continue their studies but can not leave their work.

2.1.2. Levels of education for distance learning in agriculture

Much of the distance courses in agriculture takes place at a post-graduate and master level, where the activities are less practical and the theoretical part is often more important than individual examples (Cook, op.).

Most professional training in agriculture is conducted in agricultural colleges, in full-time, evening or part-time. In the UK, a training course of one year (form: day/full attendance) is offered for young farmers who have just started working in the field. The course aims to develop their practical skills as well as to assess them continuously. At graduation a National Certificate in Agriculture is given.

The continuous professional training for farmers is provided by Lantra, the Sector Skills Council for the Environmental and Land-based Sector, formerly known as the Agricultural Training Board, which promotes training, skills development and business competitiveness in agriculture. The courses are mainly directed to practical aspects and involve a physical demonstration and / or a session of 'exchange', usually held on a farm.

Once the Lantra network was computerized, there were possibilities for offering online courses through the 'learn direct'. The first of these courses is a diversified package called 'New Horizons - Making the Most of Your Farm'. In the first year, there were over 3000 participants in this course, which includes:

• Analysis of current situation – participants can self-assess and evaluate their own business and region, according to which they propose activities, analyze examples and case studies, and print any information that is of interest;

• Analysis of some possibilities – participants can identify factors of success or failure, to avoid different types of activities;

• Carrying out a viability test – participants can assess the advantages and disadvantages of a particular type of activity;

• Planning the success – by completing a test containing questions from different fields (law, finance, etc.), the participants can find documents and produce the first real steps for any of the activities planned. Also, by covering sheets showing examples, the participants may propose various topics relevant to their business, and have access to useful data for further documentation.

The course aims to assist farmers to assess their already existing business and create alternative activities to generate additional revenue. Since the main motivation is to increase revenue, no titles or diplomas are granted. According to a farmer, participant in this course, 'I consider that the 'learn direct' approach is very flexible. I log in when it is convenient for me, and do as much, or little, I can. This flexibility is particularly useful and fits well with my everyday farming work. The 'New Horizons' course helped me consider other possibilities that I may have otherwise not have thought of'.

2.1.3. The target-public

In the agricultural sector, electronic education can address all those who wish to review their knowledge related to this field (farmers, farm managers and workers).

Agriculture is becoming more and more sophisticated, using new technologies, continuously changing due to the growing need to understand sustainable agricultural practices and regulations, such as the compulsory licenses for certain practices (e.g. using pesticides). These new requirements mean permanently updating the information.

2.1.4. Profitability of distance learning

Sometimes, distance learning is presented as more financially profitable than traditional education. The so far experience, both that of the developed countries and that of the developing ones, shows that this is not necessarily true. Distance learning has the potential to be more financially profitable than traditional education, but this is not necessarily a fact. There are several factors that contribute to significant differences regarding the costs of varied initiatives in the field of distance education: the number of the students enrolled, the combination of the communication technologies, the media and the educational materials, the level of responsiveness and interaction of the learner, the teaching staff's salaries and the conditions of employment, the production standards, the institutional working methods and the overhead costs. It is believed that distance learning is becoming more attractive economically at a higher level of education, because at this level the costs per student enrolled in the traditional form of education are higher, while at the other levels the costs are relatively similar (Mclean, 2001).

Distance learning should not be considered an inexpensive alternative to other forms of education. In some cases, it can provide very lucrative means to achieve a target group of students, but, in other cases, traditional contact (face to face) can be more financially efficient. The systematic deprivation of resources, the assumption that distance education is a low-cost alternative can lead to low quality and a reduced impact of distance learning programs (McLean, op.cit.).

Distance learning requires considerable investment before a student is admitted, both in the creation and production of the teaching materials and in the design and implementation of the institutional infrastructure. For the conventional universities in the UK, the report between the fixed and variable costs was 8:1, while for the British Open University it was 2000:1. The cost per student tends to be lower in distance learning. A distance education system may cost more in absolute terms for setting it up compared with the conventional system, but it can be more efficient in terms of costs if there are enough enrolled students, so that the average cost per student is lower compared with the conventional system of education.

Those who want to set up a distance educational system in the hope that they will have economic benefits have to ensure that:
- the variable cost per student is lower than in the conventional system of education at the same level of education;
- the number of students is large enough to reduce the average cost per student at a level that is lower compared with the conventional educational system;
- the rate of withdrawal must be kept at a reasonably low level.
These conditions have significant implications on:
- the choice of the media. Theoretically, the teaching staff working in distance education has a great diversity of possibilities to choose. In practice, the choice is limited by the absolute cost of media, as well as the effect that every solution has on the average cost per student.

- a marketing study. It aims to see whether there are enough students interested in that institution's educational programs;

- the resources used for the students' services. Due to the fact that these costs are variable, the investment in the students' services must be thought in terms of the effect they have on the average cost per student and the rate of withdrawal.

- the resources used for central infrastructure (the fixed costs of the institution). They should not be too big compared to the number of students.

2.1.5. Quality management

The purpose of the quality management in distance education is to ensure that the organizational resources are focused on the customers' needs. Quality management should not be directed only to students, but to all the participants in the system: teachers, administrators, supervisors, employees and professional associations.

Quality management activities should include a continuous assessment of the needs (formal and informal); the development of the working team of people and institutions to meet the needs; the implementation of feedback mechanisms for the effective thinking of marketing and offering programs, and to perform corrections and adjustments, as well as organize the communication between the participants of the system.[26]

Robinson (1995) states that the quality of distance education is often thought of in terms of teaching materials, regardless of medium. This indicates that a course is more than teaching materials; it is also the whole experience of a teacher. The purpose of distance education provider is to create conditions for learning. Therefore, its success depends on how well the production subsystems work and how well they are integrated into operational terms. Excellent teaching materials are used less if students do not have them on time; less quality teaching materials are of limited value even if they are given on time.

Quality assurance is being used increasingly for quality management in education. This is a set of activities or procedures carried out by an organization which makes sure that quality standards are provided for a product or service. The aim is to create a reliable system based on anticipating problems and designing procedures to avoid mistakes and errors as much as possible. Other approaches emphasize the human aspect of quality assurance. The Open University uses the initiative to 'invest in people', which involves the participation in politics and decision making, team development for all individuals at all levels as a major way of maintaining and improving institutional quality. Both approaches can contribute to quality management within the same institution (Robinson, op.cit.).

In the UK, the Open and Distance Learning Quality Council (ODL QC)[27] was set up by Government in 1968 to carry out a plan of voluntary registration for providers of home study, distance learning, online or e-learning and other forms of education. To achieve accreditation, a provider of education must meet the ODL QC standards. If someone chooses a course at an institution with ODL QC accreditation, they are sure of good service.

2.1.6. Training teachers for e-learning (e-teachers)

A feature and a challenge to understanding e-learning is the expertise needed to develop the e-learning teaching materials and the resources they need. The teaching staff needs to be professionally trained to have the skills needed and a level of expertise to identify the type of e-learning to be used, under what circumstances and with whom. There are few formal opportunities for people to improve their skills in e-learning. Professional development of teachers is fragmented in Europe.

In the UK, several companies and universities run courses for developing distance learning courses. The International Extension College[28] holds workshops and short courses for persons engaged in distance education projects and programs. Also, it issues BA diplomas for graduates of distance learning or MA ones for distance learning students of the University of London. The courses include: education and development; adult education and communication in distance learning; distance

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[26] Preluare după World Bank Global Di
[27] http://www. odlqc.org.uk
[28] http://www.iec.ac.uk

learning organization; electronic means in distance education; distance learning management and computer mediated communication in distance learning.

2.1.7. Other characteristics

Most people need a relevant environment in which to learn; they also need support. This support must have a human form – a mentor, a tutor, a trainer, a coach or an equal person. Another restriction of e-learning is the lack of contact with the teaching staff. Because of the teacher's absence, the students may feel insecure and unsure on their progress in the absence of feedback and close interaction with their colleagues.

Students become more uncertain if the course is not too well structured and if it is not very clear where they are related to their improvement. The student who drops out is more common in the distance education system than in the conventional one as it is easier for a student to withdraw from a relatively impersonal relationship with a distance course than a conventional course. As a reaction to this, distance learning teachers must take various measures to ensure that the course is well structured, with clear objectives, and a well designed studying time. The media should be used in attractive, motivating and rewarding ways[29].

A problem identified in the distance learning programs in developing countries is a lack of participation from individuals and organizations that should benefit from the design and delivery of programs. The need for participatory educational practice has been identified by FAO in a guide entitled Participatory Curriculum Development in Agricultural Education (2001) (participatory curriculum development in Agricultural Education). This categorizes the general groups of participants in curriculum development as 'insiders' (leaders of educational institutions, teachers, students, producers of educational material), and 'outsiders' (politicians, administrators from the educational field, educational experts education, employers, professional organizations, clients, founders, parents, former students and interest groups). The guide emphasizes that at the beginning of an analysis of a potential educational intervention, it is important to identify the participants in the system, to understand their different interests, and develop a process in which these actors will be represented in the planning, implementation and evaluation of the intervention. This helps to understand that distance learning initiatives are taken for just reasons, are sensitive to the learners' context and their environment, the content is relevant and fits well in the local culture and the approach to learning (McLean, 2001).

2.2. A review of the German situation

2.2.1. Evolution and development of distance learning

In Germany, general and vocational education is still strictly separate and relatively early students choose whether to go for the professional or academic education. Types of schools guide their students to general education or vocational training: Gymnasiums lead to academic studies, while the Hauptschule and Realschule lead to vocational education within the dual system. The training is usually done within a company, especially for craftsmen, in small private enterprises. Practical activities are considered very important during training.

In 2000, of the 140,000 people involved in distance learning, 30% of them attended courses in economics, 13% technical courses, 5% language courses, while 13% were studying general education. In general, economics and accounting / office work are the main areas of interest.

In Germany, there are not usually vocational courses in agriculture at distance learning. There are some computer programs available, particularly in plant and soil protection, especially for individual study or for use in schools to educate future farms' managers.

2.3. A review of other countries' situation

There are examples of successful vocational courses in agriculture at distance learning in other countries, particularly in the USA, Australia and New Zealand. Some institutions advocate for the practical need to include a residential element of training – from weekends to longer sessions.

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[29] World Bank Global Distance Educationet, Teaching & Learning, http://www1.worldbank.org/disted/ Teaching/teaching.html

2.3.1. Australia

Australia had a long history in providing education through correspondence for its vast rural population. The Australian Correspondence School (ACS) offers a number of certificates and diplomas for courses in agriculture and bioscience topics that are internationally accredited by the International Accreditation and Recognition Council[30]. It offers courses in agriculture, livestock, agricultural marketing, animal health, aquaculture, cattle, steer raising, dairy cow raising, farm management, irrigation and irrigation management, grassland management, pig raising, poultry raising, sheep raising, soil management, sustainable agriculture and weed control. The advanced diploma in livestock consists of 21 modules; participation in three modules of one week of workshops; three industrial conferences and seminars and three modules of 100 hours of research projects and another 2600 hours for completion. The target student is a person with five years of industrial experience and a standard training of 12 years of education. Of the course requirements one can understand that those courses are aimed at people who already have considerable practical knowledge and experience and who want to acquire more technical knowledge about their field of interest or the field they are qualified in.

ACS provides the following media:

• Students can speak with tutors by phone.

• Tutors respond quickly to inquiries received by fax or email or phone by fax or email or phone.

• Personal guidance through video conferences is available if desired.

• Providing access to additional explanations, when necessary, by accessing a database with over 350,000 pages.

• Video for rent.

• Students can visit ACS's offices to use the library or meet a tutor.

• Request for books by mail, service that provides a wide variety of books.

• A unique Web page for students which includes chat-rooms, forums, student directory, and presentation of topics.

2.3.2. The U.S.A.

The U.S.A. has a long history of providing information to farmers through the agricultural extension service, which is in connection with the state universities.

An example is the courses of the Kentucky Cooperative Extension Service / the University of Kentucky, College of Agriculture[31] (UKAg) which address high school graduates. The courses are designed to have a support site actively involved, to help students in taking notes, studying and passing college-level tests.

Students may be able to successfully take these courses if they allocate enough time and effort. The course content is very general in nature. Although the courses are initially created by the schools in Kentucky, efforts are taken to ensure that they have a national perspective. The courses are mainly about the vocabulary and basic scientific principles that apply to students across the country.

Educational Media UKAg offers 5 different electronic field trips and free online teaching materials that would support the learners. These field trips give students the opportunity to experience agriculture in their classroom. Students can choose an electronic field trip to help them learn more about a topic and see the written educational materials. An electronic field trip to a cattle farm is an interesting way to learn about cattle raising without leaving the classroom. Students who are from cities and suburbs can be very curious to learn what life is at such a firm. During the field visit to Salt River Farms in Boyle County, students learn why the Bluegrass Region is so good for cattle and other animal species, they learn about a typical day in a cattle farm, how a veterinarian knows if an animal is sick, as well as a little about the farm economy. There are many activities to choose from. An electronic trip to a fruit tree plantation also includes instructions for an experiment with apple trees to learn what conditions are required for life. This experiment can be done at home using everyday materials.

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[30] IARC http://www.iarcedu.com
[31] http://www2.ca.uky.edu

III. CONCLUSIONS

In Western Europe there is a limited experience on vocational distance education that can be applied in agriculture. However, there is a huge amount of literature, studies and research on all aspects of distance education. World Bank page on distance learning is a very useful summary of the experience in this field and it is particularly informative and valuable.

The main advantage of distance learning is that it makes people learn how, where and when they want. It provides new ways of learning, new opportunities and new qualifications. People are taking responsibility for their own study.

At the same time, people need motivation, discipline and time for study. The teaching materials should be relevant to their needs. People also learn by interacting with other people.

Quality control and accreditation are important, of course, depending on the type of course. They can be vital for the recognition of the given qualification.

The cost of developing a distance learning program may not be lower than a normal course. Distance courses are time consuming, expensive to implement and require a good administrative support.

In designing a distance course the participation and consultation of all participants in the system – employers, teachers, and students – are important to ensure the relevance and acceptance of the content of a course and its purpose.

It is a well-known fact that agriculture is particularly difficult to teach through distance education. It is more relevant the formation of a knowledge base, the acquisition of theoretical information for people working in the field, having practical knowledge.

The reasons why distance education in agriculture is limited are valid for Romania, Slovenia and Bulgaria, too.

3.1. Recommendations for România, Slovenia and Bulgaria

➢ The findings of this report can be considered in any decision on the development of distance learning.
➢ In Western Europe, as well as in other countries, activities are carried out to draw up the details of the implementation of distance learning courses in agriculture and biological sciences.
➢ Discussions are held with all participants in the system about the needs of vocational agricultural education, how it can be held and the costs of the considered alternative methods.
➢ Partner countries that already have experience in distance learning in other fields investigate how effective and well received these programs are.
➢ If it is considered distance electronic education, the key people in its development should consider obtaining a degree in distance learning.

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