

ABSTRACT

In the long run, the development of a region is determined by three factors: natural resources, geographical location and human resources. The most mobile of these factors is human resources, whose shaping force lies in the level of its educational and professional skills (ENYEDI, 1996). The regional investigation of the establishment of consultation centres (that catalysed the realisation of IT engineering distance education) can be connected to the different competitive position of the various regions due to regional differences and inequalities. This investigation has to consider the influence of the economic environment as well. The most important economic index of regional differences is the GDP (Gross Domestic Product), which is influenced by regional differentiation, employment and unemployment, education, as well as traffic and communication infrastructure. It is all these factors that shape the regional demand for professional education both in space and time. The distance learning higher education course of DGC was a response to meet the labour market and education demand for IT knowledge. The widespread appearance of DGC consultation centres (knowledge as the product and teaching as the service) seems to be justified by the ever increasing number of 'customers' who 'buy' this service. It is reflected not only by the increasing number of these centres, but also by the extending territory they cover. The systems approach of innovation defines innovation as a process resulting from the interactive learning of several participants, influenced by several factors. According to this approach, we can consider the activity of the organisation (DGC consultation centres) as a system for 'acquiring knowledge', accepting that the acquisition of theoretical and practical knowledge, i.e. learning is a social process (SPENDER, 1996).

In this individual case, it was proved as well that the role of knowledge-based activities is vital in terms of national and regional competitiveness. From the point of view of competitiveness, knowledge and innovation are closely related and connected.

Distance education is suitable for transferring knowledge at a regional level and new knowledge can be considered as capital in economic terms. The innovation diffusion of new knowledge enables regions to join the development processes of knowledge-based economies.

Keywords: distance education, innovation, region, knowledge, economy

ÖSSZEFOGLALÓ

Jelen cikkben arra vállalkozom, hogy felhívjam a figyelmet néhány olyan eredményre, amely kiindulási pontként értelmezhető a távoktatás komplex rendszerét tervező, szervező folyamatokban.

Egy térség fejlettségét hosszú távon három tényező határozza meg: a természeti erőforrások, a földrajzi fekvés és a humán erőforrások. Közülük a legmobilabb elem a humán erőforrás, amely elsősorban az iskolázottsági, szakképzettségi szintjével formál (Enyedi 1996). A műszaki informatikai tudás távoktatási rendszerben történő megvalósulását katalizáló konzultációs központok kialakulásának területi vizsgálata – a piaczgazdasági környezeti összefüggésekkel – kapcsolatba hozható a területi különbségekből, a területi egyenlőtlenségekből adódó egyes régiók eltérő versenypozíciójával. A területi különbségek alakulásának legmeghatározóbb gazdasági mutatója a GDP (Gross Domestic Product), amely a területi differenciálódás, a munkanélküliség, a foglalkoztatottság az iskolai végzettség, a közlekedési és a kommunikációs infrastruktúra hatására alakul. Mindezen tényezők összessége alakítja ki egy térség szakképzés iránti igényét térben és időben egyaránt. A tényezők együttes hatásaként jelentkező informatikai tudás iránti munkaerőpiaci keresleti, képzési igény kielégítésére válasz a GDF távoktatásának megjelenése a felsőoktatásban.

Magyarország tekintetében kijelenthetjük, hogy a központok kialakulása elsősorban a régiós szerepvállalású településeket és a megyei jogú városokat érintette, és csak nagyon elenyésző számban jelent meg kisvárosi szinten. A távoktatás, mint oktatás-innovációnak tér és idő összefüggés vizsgálata ad magyarázatot a határon túli területek magyarlakta településeken való megjelenésre. A távoktatási módszereken alapuló oktatás, tudás közvetítés eredményessége, sikere az oktatási hálózat, mint összetett rendszer egyidejű összehangolt működése során valósult meg.

A Romániai városokon túl a GDF távoktatás innovációját megvalósító diffúziós folyamat során további határ menti országokat érintő konzultációs központok jöttek létre Szabadkán, Kassán, Diószegen. E tekintetben kiemelten fontos minden azon tényező figyelembevétel, mely előbbre viszi, segíti az irodalmi magyar nyelvismeret továbbvitelét különösen a szakmai nyelv területén, mivel ezen keresztül újabb csatorna nyílhat meg az anyaország munkaerőpiacán való részvételre.

Igazolódott, hogy a tudás alapú tevékenységek szerepe jelentős az ország és a régiók versenyképessége szempontjából. A tudás és az innováció szorosan összefüggő, összekapcsolódó folyamatok a versenyképesség növekedése tekintetében.

Az új tudás innovációjának diffúziós folyamata biztosítja a térségek bekapcsolódását a tudásalapú gazdaság fejlődési folyamatába, a regionális együttműködésben.



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THE INTRODUCTION OF DISTANCE EDUCATION TO HIGHER EDUCATION IN HUNGARY

*A távoktatás módszerének megjelenése
a felsőoktatásban*

*Uvođenje učenja na daljinu u visoko
obrazovanje Mađarske*

Introduction

My aim is to draw attention to some findings that can serve as good starting points when planning or organising the complex system of distance education.

For this purpose it is essential to clarify the definition of distance education and also to describe and evaluate its gradual but constant development that has made distance learning a decisive educational means in contemporary tertiary education.

Research: History and Background

If you want to analyse the concept of distance education, you have to go back to its origins. The idea of distance learning started to develop in the 1840s, when shorthand skills were first taught via mail. The mediator of this innovative educational activity was the British Isaac Pitman (via the postal service). With the help of correspondence, he managed to overcome the obstacle represented by the geographical distance between the teacher and the student. The next significant breakthrough occurred in 1926 with the introduction of radios, which opened up new perspectives. The 'delivery' of education materials was much faster via radio waves. In 1939 another technological invention contributed to the development of distance education; the telephone. With the help of telephones, teachers and students could establish personal contact relatively easily and fast, and this kind of connection simplified the consultative presentation of the learning material. The relationship between the teacher and the students and the presentation of the material changed again in the 1960s, after the appearance of the television. The introduction of TV as a new method of distance education involved the audiovisual presentation of the material. However, it was the spread of personal computers and then the internet that provided by far

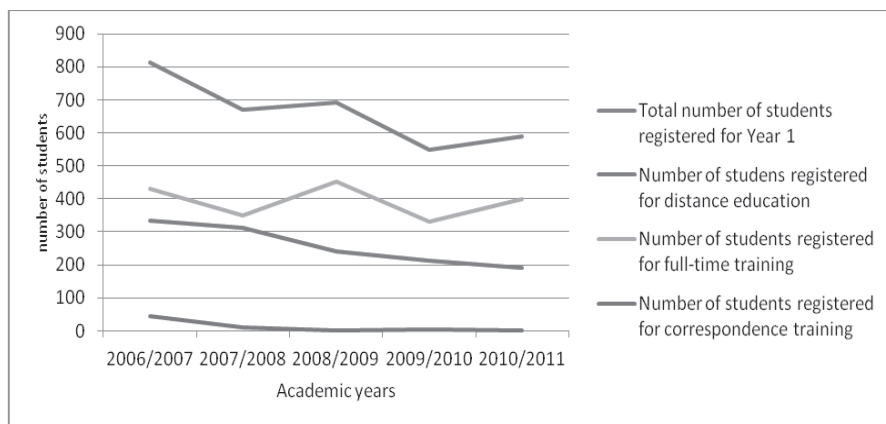
the most ideal conditions effective distance education can be based on. Inequalities caused by geographical distances can be overcome this way and almost anybody can access high-quality information and knowledge in a very short time. As a result, the term ‘e-learning’ has started to replace ‘distance learning’ due to the development of information and communication technology. In Hungary we also use the latter term besides various other phrases, such as ‘electronic study materials’. As a result of the evolution of the term, and considering the pedagogical objectives that perceive the activity and relationships of distance education as a uniform methodological system, CSOMA (1975) describes distance education as follows: ‘Distance education is the peculiar relationship between the two poles of the teaching-learning process. It is a kind of guided learning, where the two poles of teaching and learning, the guiding and the guided systems are separated from each other both in time and in space. In distance education the peculiarities of guiding are determined by the fact of this separation’.

Modern distance education started with the foundation of the Open University 1969, the news of which spread worldwide. The social, political and economic atmosphere in Hungary in 1970 and the next two decades significantly slowed down the acceptance and introduction of distance learning as a complex educational method at the different levels of education. It appeared first in the 1980s, mostly in the field of postgraduate courses. One of the most significant areas was the public education leadership program, a continuing education program in Pedagogy. The program was launched by the Department of Pedagogy at the Budapest University of Technology and it targeted teachers in public education who already had a degree in education. At that time distance education was mostly offered in master courses; bachelor courses were only offered in the form of full-time training. However, some private institutions were already organising distance education professional trainings. No matter at which level or area of education it is used, distance education mostly characterises institutions and professional fields that have a flexible organisational structure, as well as a flexible training system. It is only these institutions that can both appreciate challenges of the labour market and adapt their programs accordingly. These adaptations can affect structural, methodological, organisational areas of the program or even its course requirements.

The research of KOVÁCS (1992) gives a detailed history of the development of distance learning in Hungary in the 1970–1980s. She emphasises the early, sporadic organisation of distance learning, highlights its characteristic features, student-teacher role models and their relationship in the new training method. At the end of the 1980s Hungarian professionals started to attend international events in the field of distance education. It means that the socioeconomic environment had become more open and receptive, and you could actually detect the first signs of modernisation (which were to become the basis of distance education) in the field of education as well. The key figures of this innovative endeavour, the initiators of distance education

acted mainly in private companies dealing with educational organisation, and not in the field of public education. The first area of distance learning was foreign language courses organised through foreign representatives of distance learning by adopting their methods and programs.

As a result of the socioeconomic changes at the beginning of the 1990s, the development of distance education was reconsidered in Hungary; now it was seen as a methodological means to make education available for as many people as possible. The roots of Hungarian mass education date back to the 1950s, when the first correspondence courses were organised (KOVÁCS, 1995), mostly in secondary and tertiary education. However, the term 'correspondence' is deceptive in this case, as this kind of education did not use postal service, students did not get the study materials via mail and the assessment of the students was not carried out with the help of letters either. The most important difference between full-time and correspondence training is that teaching sessions are not held on a daily basis; they are replaced by blocks of teaching held once or twice a week. The venue of teaching is still the building of the organising institution. The course material and course books are the same as those taking part in full-time training. During the course, the semesters and the exam periods coincide with that of full-time students. What does differ is the length of periods dedicated to teaching/learning, as there are shorter or longer interruptions between teaching periods and the students have no contact with their teachers between two teaching periods. This form of teaching is still present nowadays but it is steadily losing its importance. This is especially true for institutions or majors where students have the possibility to choose between correspondence and distance education.



*Figure 1: Number of students registered for the different forms of training between academic years 2006/2007 and 2010/2011
(Source: DGC data, edited by BAKOTA, É. 2012)*

Figure 1 draws the attention to the demand for the various forms of BSc/BA education by comparing the number of students who registered for these courses. It is obvious that the demand for correspondence courses has almost disappeared, this form of training is no longer sought and its reintroduction would definitely result in a failure.

Possibilities of introducing distance education to higher education

In order to support the method of distance education, in 1991 the government established the Hungarian National Council for Distance Education (Nemzeti Távköztanítási Tanácsot, NTT), and a year later, in 1992 six regional centres were created in Debrecen, Gödöllő, Győr, Pécs, Szolnok and Veszprém. These centres are supposed to perform coordination tasks in their area and assist organisations involved in distance learning so that they can realise their aims. As a result of the dynamic spread of education organisation based on the methods of distance education, by 1993 several institutions had been established all over the country that used teaching materials which were based on the methodological principles of distance education. It means that professional trainings are held in modules and the organisation of teacher-student dialogues matches the structural framework of distance education.

On the whole we can say that distance education is available in a wide range of professions; however, it has not penetrated the field of bachelor training courses in tertiary education. The reasons for that are the organisation of distance education and the lack of necessary conditions and significant financial investment. One of the most important obstacles to its spread is a network, which had to be created and operated first, as it had no established institutional culture in Hungary. Furthermore, there were no course materials compiled according to the methods of distance education so that they could ensure an individual and independent way of learning. These study materials had to be written and it needed a significant investment of capital, whose return is relatively slow. The necessary financial sources were provided by PHARE, TEMPUS and some other projects supported by the World Bank, as well as the invitation of private capital.

Besides considering these factors, the economic potential of the affected region and the development of human resources are of special importance when organising professional training courses. Thus distance education courses require thorough preparation; you have to analyse the educational market as well as the relationship between demand and offer, and it can show considerable regional variations. During the organisation you cannot ignore the research findings on regional educational dimensions, as these results give information of regional differences that can guide the establishment of an educational network. (TRÓCSÁNYI – TÓTH, 2002). Information technology has gained a key role as the means of acquiring knowledge for people whose geographical, sociocultural and economic environments differ. From the aspect of knowledge management, information technology is not only a tool but it provides a framework for those concerned so that they can acquire knowledge easily.

In our opinion, the method of distance education is connected to knowledge as

a product, its spread and its spatial and temporal dimensions by the geographical explanation of innovation. Several recognised researchers have dealt with innovation theory research. One of the most eminent scientists of Swedish geography is HÄGERSTRAND, whose work on spatial processes (*The Propagation of Innovation Waves*, 1952) defined the basic tendencies in innovation spread. The author gives a model-type explanation of the spread of technical, social and personal innovations from innovation centres considering the role of adopting and rejecting areas. His other study (HÄGERSTRAND, 1957) examined the general spatial features of migration with regard to areas of origin and receiving regions. SCHUMPETER (1980) describes innovation - which can mean both the activity and its result – as a new combination of producing power. When classifying the different cases of innovation, Schumpeter identified five types: new products, new production processes, new markets, new sources of supply materials and new forms of organisation; all adjusted to the task. If we re-think SCHUMPETER's notions, innovation can also refer to new ideas, knowledge, individual and community behaviour, organisation and activity, whose adaptation affects socioeconomic development (RECHNITZER, 1993). A Hungarian innovation researcher, RECHNITZER (1993, 2002) reinterpreted the definition of innovation, and he also studied and classified the shared ideas of HÄGERSTRAND's and SCHUMPETER's theories.

The research results of regional developments reveal and focus the attention on the human element, which gets in the centre of development (RECHNITZER, 1993, ENYEDI, 1996), as it was proved that the success of regional development in the 1990s depended on the number, complexity and intensity of human factors. The examination and assessment of the complicated and multifactorial relationship of unit area and human resources can be interpreted as a coherent whole. The human resources of a unit area are the combination of several human and social conditions and facilities that cover both human factors and the institutional factors and social influences that affect them. 'These factors are present individually and together as well'; moreover they either strengthen or weaken each other's effect when shaping the unit area concerned, and through them shaping the whole spatial structure (ENYEDI, 1996).

The results of the above mentioned innovation research support the fact that the innovative character of distance education cannot be ignored when examining and interpreting it. In our opinion, this examination cannot only broaden our knowledge of distance education but it is also an essential factor in its successful realisation. As a result, we can conclude that the necessity of the appearance of distance education as a method at various levels of education and professional training courses can only be assessed and interpreted in an authentic way through factors affected by all fields of social geography, as neither the activity nor the person can be isolated either spatially or temporally from the geographical area where they exist.

Successful realisation of a distance education method in the Pannonian Basin through an individually implemented example

Prelude

Dennis Gabor College was the first higher education institution in Hungary that carried out research in the field of distance education and it pioneered its practical realisation. The development of the college in educational sciences has significantly augmented our knowledge of distance education. The organisation and operation of IT Engineering distance education was a very important achievement in terms of technical science, history of science, cultural geography and education geography both in Hungary and in the whole Pannonian Basin.

In 1979 new perspectives opened in one of the most prominent fields of human history, in microelectronics as well as in computer and information technology. LSI (Large Scale Integration) education centre was founded by 20 Hungarian institutions from the field of electronic industry and research, and then LSI IT Education Centre established a foundation for the application of microelectronics. The foundation is actively involved in the spread of IT culture in Hungary and in education organisation and – by publishing scientific technical literature – it filled a huge gap in the publication of technical-microelectronic professional literature. Its aim was to create an ‘Open University’ in Hungary, as this form of education was considered to be the most suitable for learning the application of microelectronics and microcomputers. The activity of the foundation was a huge success both in the field of spreading IT culture and in making IT knowledge available for the public. In 1992, the new socioeconomic environment brought forward changes in attitudes towards education policy, and the road was now open to establish a private technological college based on distance education methods. The legal status of the college is based on a governmental decree [Nr. 1027/1992. (V.12.)]; according to this, Dennis Gabor College (hereinafter DGC) is a non-profit organization, established and sustained by Dennis Gabor Technical Informatics College Distance Education Foundation. It was the first Hungarian higher education institution that applied distance education in bachelor training, thereby starting a new era in the history of Hungarian higher education. The establishment of a technical college based on distance education (1992) meant that tertiary education became easily available for people with various geographical, sociocultural and economic backgrounds.

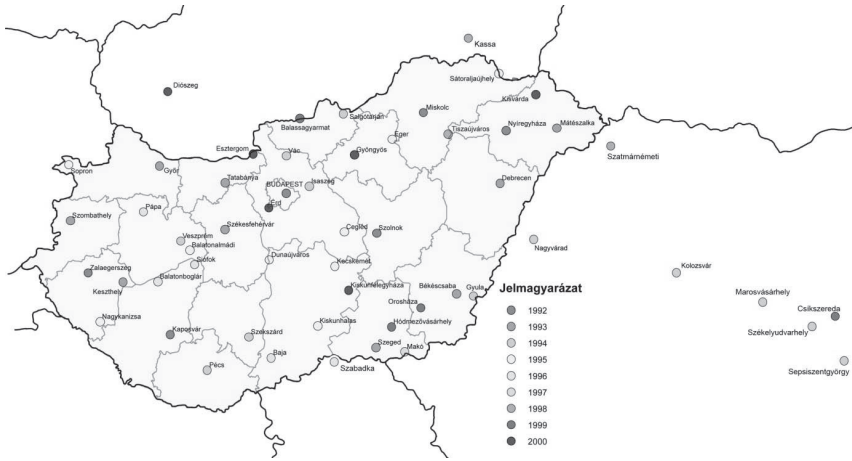
This new college that was founded at the beginning of the 1990s was a pioneer in the Hungarian higher education system for many reasons. The most important characteristic feature of the new system was flexibility, i.e. the training content was adapted to the new economic environment while, at the same time, it successfully combined the traditional values of education with the new organisational-managerial solutions required by mass education and self-financing (HRUBOS, 2004). Based on the character and depth of changes, CLARK (1998) identified three types of higher education institutions resulting from the changes of the economic environment:

service providers, business entities and entrepreneurial types. The definition of the entrepreneurial type is very important in our case as its exact interpretation will help us to understand the inseparable relationship between innovation and distance education and the link between creating something new and its risks (SCHUMPETER, 1980).

There is a higher demand for IT professionals as a result of globalisation and economic changes that aim to create knowledge societies and knowledge economies. However, but for a very few exceptions Hungarian higher education could not adapt to the new, explosion-like increase in demand flexibly enough. The innovation process of DGC IT engineering distance education gives us a good example of fast adaptation to market needs. Teaching-learning based on distance education and the network of consultation centres enable students to choose the most ideal consultation centre, which is the closest to their home or workplace (BORNEMISZA - BAKOTA – KOPÁRI, 2011). The educational profile of DGC is unique in the Hungarian higher education. The mass education of college-graduate IT engineers meets the labour market needs of the society and its regions.

The idea itself (SCHUMPETER, J. A. 1980) originates from Budapest, the centre of Dennis Gabor College. The first innovation centres that meet the definition of HÄGERSTRAND (1952) were established in Kaposvár, Miskolc, Nyíregyháza, Szolnok and Zalaegerszeg, besides Budapest. The innovation of distance education spread at a dramatic speed and it soon covered the whole area of Hungary and those regions of the Pannonian Basin that are inhabited by Hungarian people. As a result, both inside and outside the Hungarian border, a remarkable network of consultation centres was established. The increase in the number of innovation centres led to the joining of further regional centres. The spread of IT engineering distance education clearly suggests that if we want to examine the realisation of innovation, we have to look at knowledge flow and knowledge transfer.

The database for my research into the spatial structure of distance education innovation came from three sources: the registers of two departments at DGC (Department of IT Applications, Department of IT Systems) and the database of the Academic Department. In order to be able to demonstrate the complete lifecycle and to compare some well-defined periods of the lifecycle I had to group the data according to uniform points of view. The most reasonable way of classification seemed to be the investigation of the spatial structure of distance education innovation in consecutive academic years. In line with this, the date of establishment of the consultation centres was also grouped according to the academic years (1992-2010) so that we could analyse the dispersion of innovation. When listing the consultation centres we did not separate the figures coming from inside or outside the territory of Hungary. The method of spatial information technology could handle the statistical data of Hungarian settlements fast and accurately, and it could also give a clear, map-based illustration (BORNEMISZA – KOPÁRI - BAKOTA , 2011).



Jelmagyarázat: legend

Figure 2. Spatial structure of settlements with DGC consultation centres (1992-2000.)

Source: Edited by BORNEMISZA AND KOVÁCS, based on their own data (2011)

The data of the research show that the innovation process of distance education can be traced from its origin throughout the whole diffusion period. Between 1992 and 2000, the network of consultation centres (which are the most important determinants of distance education system) spread all over the country. Consultation centres were established in all regions and counties. As regards Hungary, we can say that consultation centres are mainly located in towns that fulfil some regional roles and in cities with country rights; you can hardly find any centres in smaller towns. If we examine the relationship of space and time in connection with distance education (as a representative of education-innovation), it can explain the appearance of consultation centres beyond the Hungarian borders, in areas inhabited by Hungarian people. The efficiency and success of education and knowledge transfer based on distance education was realised through the harmonised operation of this complex education system.

Besides Romanian cities, consultation centres were established in other cities near the Hungarian border (Subotica, Kosice, Sládkovičovo) as part of the innovation diffusion process of DGC (Figure 3). Here it is important to consider every factor that promotes and assists the survival of the Hungarian language, especially in the field of professional language use as it can open up new possibilities for these people to enter the Hungarian labour market.

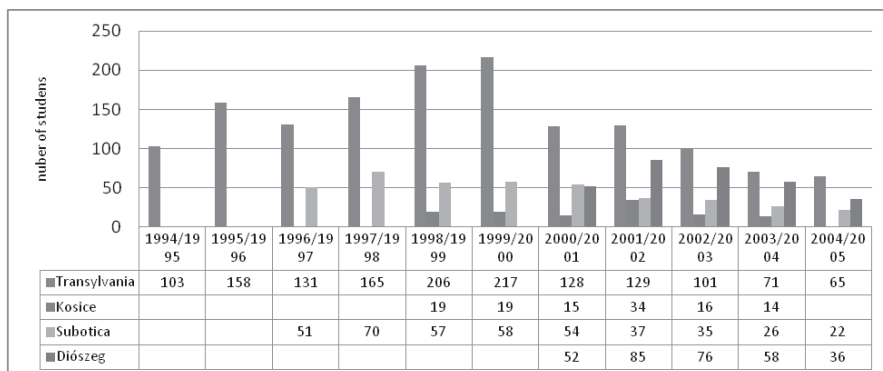


Figure 3: Number of staff at consultation centres outside Hungary broken down by academic years
(Source: DGC register, edited by BAKOTA, 2012)

One of the most significant results of the process of distance education innovation is that more and more people wishing to study can take part in IT engineering training.

In the beginning, the distance education training offered by DGC did not have all the characteristic features of distance education. DGC plays an important and key role in the history of Hungarian higher education offered in the form of distance education, and it is also a key character of the market. The success of the distance education model is connected to the efficiency of knowledge management application. The content of knowledge management is summarised by NOSZKAY (2007) as follows: knowledge management is not a new phenomenon; it is almost as old as human culture. What is new and different is knowledge integration, knowledge sharing, knowledge transfer, as well as the way of manifestation that is completed by the background support of IT providing an infrastructure for those concerned. This way all the information can be assessed and combined easily (NOSZKAY, 2007). The successful transfer of knowledge mediated by the method of distance education necessitates the simultaneous and harmonised operation of a system which is complex in itself. The distance education system of the college (both its knowledge transfer and knowledge management) makes DGC the pioneer and also one of the most decisive players in the history of Hungarian distance education. As it was unique at the onset, the initial defects and weaknesses of the system can be traced back by examining the evaluation of accreditation and new major appeals. All these assessments went a long way to improve the organisational and educational structure. As a result, it is easy to appreciate 19 years of experience and establishment beyond the structure and logistics of the organisational structure. The college uses ILIAS (Integriertes Lern - Informations - und Arbeitskooperations System = Integrated Learning, Information and Work Cooperation System) for the preparation of the special e-learning-type education materials. ILIAS has been

developed by the University of Cologne since 1997. ILIAS is an open source code, free software; a distance education framework that can be used to create learning content in accordance with international e-learning standards. Its use is increasing continuously; it operates in 59 institutions of higher education in 15 countries. In the European Union, it is used by 27 universities and 19 colleges in 7 Member States. It has been translated into 14 languages; the Hungarian version operates under the care of DGC. All consultation centres and students of DGC have an access to the system. In order to ensure training quality, DGC transforms consultation centres into knowledge centres and, at the same time, it strengthens its quality control. Through its method of distance education, it also plays a missionary role beyond the Hungarian borders by training IT professionals there, as it enables these students to obtain a degree in higher education in a very up-to-date and developing profession, even if they live in remote areas. According to the work of BARR and TAGG (1995) on the mission of higher education institutions the 'Instruction Paradigm' will be replaced by the 'Learning Paradigm' through changes in the mission, culture and structure of the institutions.

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