

CONDITIONS AND LIMITATIONS OF MULTIMEDIA SENIOR EDUCATION IN REGIONS

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Abstract

The present paper is aimed at proposing and verifying new methods of distance education that is carried out by means of multimedia tools. It also deals with the development of network services availability in the countryside. Furthermore, computer literacy of education organizers and participants and economic benefits of virtual education are targeted in the paper. The system of the Virtual University of the Third Age that has been offered since 2008 at the Faculty of Economics and Management of Czech University of Life Sciences Prague (CULS Prague) serves here as a tool or prototype for verification of multimedia senior education opportunities in the regions. The above-mentioned system also reacts to and at the same time develops the so-called „third role of universities“.

Key Words

e-Learning, virtual education, lifelong learning, rural development, ICT, third role of universities, senior, University of Third Age (U3A), Virtual University of Third Age (VU3A)

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Introduction

People nowadays experience their retirement age in a good physical and mental health and as a result, they are able to participate actively in various all-society events. However, maintaining such a good and desirable condition as long as possible requires an active lifestyle. Senior education represents not only a vigorous approach to ageing, but at the same time, one of the means of looking for a way of life, life values, learning opportunities and necessities of life (Lemieux, Boutin and Riendeau, 2007; Šemberová, 2008). Education, one of key life values, represents the “good” in life, a zest of spirit that can be and should be available to all people. At this point, we should mention a new focus of universities, the so-called third role of universities. Since Humboldt reforms at the beginning of 19th century, teaching and research have traditionally been considered as the two main, if not the only, functions of universities. The above-mentioned third role of universities, in other words their “public service function” or “community service function” represents another important mission of universities which goes hand in hand with greater social responsibility and a wider spectrum of university tasks (Čerych, 2009). One of these activities is the University of the Third Age (U3A).

According to Williamson (2000), the University of the Third Age is an activity with a tradition and history of more than thirty years. At present, it takes place under different forms at almost all Czech universities. It is generally estimated that more than 400 various educational programs are offered and more than 20, 000 senior citizens are enrolled in the Czech Republic. As a matter of fact, nearly all educational programmes are bound to universities, i.e. to Prague and regional capital cities. It means that the U3A as an active way of spending retirement time is

practically not available to most seniors from smaller towns and rural areas.

However, Huang (2005) or Stadelhofer and Marquard (2008) mention that fast developing information and communication technologies represent a unique opportunity in many countries to make senior education accessible to the widest possible number of interested people and consequently to provide equal opportunities to all seniors regardless to the place of their residency.

The aim of the paper is to propose and verify new methods of distance (virtual) education carried out by means of multimedia tools (Swindell, 2002) and the development of network services availability in the countryside, as described in Šimek, Vaněk and Jarolímek (2008).

Other examined aspects are computer literacy of education organizers and participants (trainees) and also economic benefits of virtual education (Micheuz, 2006).

At present, several projects dealing with the access to education in regions are being solved at the Czech University of Life Sciences Prague. Optimal technologies available in regions, various forms and methods of both group and individual education are being explored. Replacing personal, face-to-face contact by the electronic one and a sheet of paper by a web is simply not enough. The process requires a substantial change of accustomed, conventional procedures, which can be the most difficult task.

Material and Methods

The system of the Virtual University of the Third Age (VU3A) that has been offered since 2008 at the Faculty of Economics and Management of Czech University of Life Sciences Prague serves here as a tool or prototype for verification of multimedia senior education opportunities in the regions (Jarolímek, Vaněk and Šimek, 2010).

The University of the Third Age provides seniors and elderly persons with both general and special-interest non-professional education at the university level. It has been developed in many countries for more than 20 years (Schuller and Bostyn, 1992). The range of educational activities is very wide, diverse and differentiated. It includes comprehensive educational programmes (1 – 3 years), innovative courses focused on new technologies, conversational language courses, activities supporting good physical and mental health and, last but not least, various programmes developing self-directed learning strategies.

The main objectives of the University of the Third Age:

- “bio-psycho-social” development
- adaptation to the ever changing life and social conditions (technologies)
- cross-generational dialogue

Even if we may perceive seniors as a more or less homogeneous age group and therefore assume the tasks and needs of such a group, there exist a real need for plurality and variability of senior programs as well as unacceptability of unified approach and narrowing the “needs of old age” to a minimum.

As described in Farell (1999) or Van de Vord (2010), **the Virtual University of the Third Age** represents a new alternative to

conventional lecture teaching. It is based on the use of new communication technologies and the internet, combining the elements of distance education and eLearning. It can also be a suitable complement to classical full-time or attendance education.

Modern didactical means of university education develop very fast. In close connection with that development, new areas of the so-called media didactics and media pedagogy are born. **The media didactics** deals with the integration of component media into the education process in order to reach its optimization. **The media pedagogy** creates the media as such and deals with their usage as the object of the analysis. Both of the before-mentioned relate to each other and blend together. Virtual education uses both the theories and practical experience that stems from university pedagogy.

Following current global trends, media tools are expected to be more and more used in all types of education. Interactive technologies and creation of systems that enable all users to be actively involved have been analyzed. For instance, Yves Bertrand, world-famous pedagogue, indicates the creation of open models (thus true virtual courses) as a basic general principle of media background arrangements.

Nehodová (2010) mentions that this kind of education has a **virtual character** – multimedia lectures exist only in an electronic form, they have actually never taken place and they can neither take place in this form. Multimedia lectures also contain video-sequences from real lectures, but their main asset is a special interpretation accompanying the video material – shot in exteriors and laboratories including details from a microscope or telescope, charts, diagrams, scientific pictures, computer animations etc. Besides that, audio records, supporting music or other acoustic background can be used as well.

Virtual education is primarily focused on staff/worker education in regions, i.e. on users who cannot take part in present form lectures for different reasons. Topical cycles of multimedia lectures, accompanied by generated tests, syllabi, questions for a lecturer, discussion forums or further study materials are displayed on a virtual education portal. Registered students can return to virtual educational materials on the portal anytime. The participants can repeatedly go either through the whole lecture or just through its parts according to their need; without place, time or background limitation. Completing the generated tests, students get an immediate feedback on their understanding and topic mastering. While filling-in the tests, students can check the lecture or any detail of it and work the test out at their own pace, without any time limitation and stress.

The participants as well appreciate the possibility to ask the lecturer later on – several days after the lecture, i.e. after thinking the topic or subject over, whereas in conventional education there is just a limited time for questions immediately after the end of a lecture.



Figure 1: Illustration of multimedia lectures and other study materials (Jarolímeck, Vaněk and Šimek, 2010)

As far as conventional presence lectures are concerned, their participants can carry off only what they managed to note down and remember; they have no possibility to return anyhow to the speech of the lecturer and eventual printed study materials never fully substitute it. The main didactical advantage of the virtual method of education over conventional presence lectures is the possibility of repetition – *repetitio mater studiorum*.

Selected terms of the Virtual University of the Third Age

- a study program of U3A – mostly a two-year study programme composed of 4 thematic term courses; the study is usually terminated with a certificate of program graduation; some courses take the form of virtual education
- a course – a collection of four to twelve thematic lectures taking place within one term
- a lecture – a particular lecture on a given topic, recommended length of a multimedia virtual lecture for seniors is 35 – 45 minutes
- a course guarantor – the university which created the program thematically
- a chief lecturer – a university pedagogue responsible for the content quality and methodological aspects of the course; he/she manages a team of lecturers; each lecturer is then liable for the quality of his/her lecture and for keeping instructions of the chief lecturer.
- a consultancy center (CC) – a workplace contracted by universities in order to offer their study programs. The consultancy center provides technical equipment/facilities and determines the contact person.

- a contact person – a person that ensures the administration, selects course topics, registers participants and sends applications to the course guarantor. He/she leads the general organization of group education and secures technical aspects of the education (the start of education, technical support in test filling or in sending questions to a lecturer).
- a participant of VU3A – a senior citizen registered by means of on a written application in a consultancy center; he/she participates in lectures and observes the rules.
- a course schedule – the schedule of virtual learning, gives the dates when each section of teaching - lectures, seminar papers, tests, etc. must be completed during the semester
- a virtual education portal - the main presentation, evidence and communication tool of the virtual education www.e-senior.cz

The VU3A has been realized at the CULS Prague since the academic year 2008/2009. The results shown in the table below have been obtained within five consecutive terms:

Semester	Number of consultancy centers	Number of seniors involved
Winter Term 2008/09	8	124
Summer Term 2008/09	12	201
Winter Term 2009/10	20	293
Summer Term 2009/10	25	398
Winter Term 2010/11	36	612

Table 1: Development of the number of participants and consultancy centers

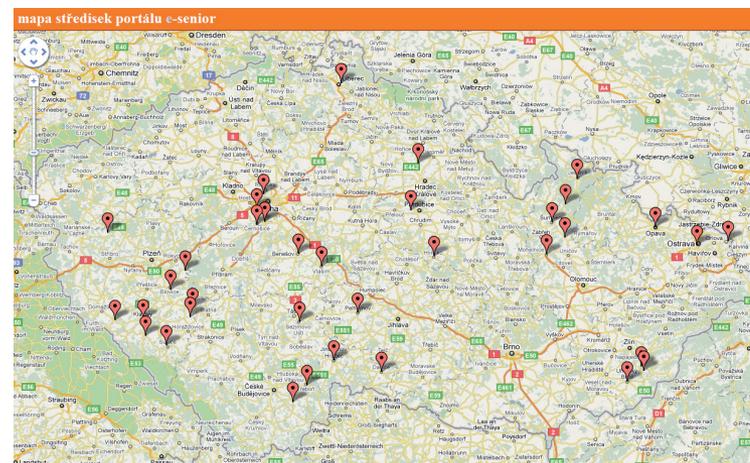


Figure 2: Consultancy centers allocation

At present, 8 educational courses are prepared (each consisting of 6 multimedia lectures accompanied by tests and syllabi):

- Astronomy (guarantor: Faculty of Mathematics and Physics, Charles University in Prague)
- The Development of Information Technologies (guarantor: Department of Information Technologies, FEM CULS in Prague)
- Ethics as the Way Out of the Society Crisis (guarantor: Technical University of Liberec)
- The Development and the Present State of the European Union (guarantor: Department of Economics, FEM CULS in Prague)
- Decision-Making Support and Management (guarantor: Department of System Engineering, FEM CULS in Prague)

- Forestry (guarantor: Faculty of Forestry and Wood Sciences, CULS in Prague)
- Growing and Using Edible and Medicinal Mushrooms (guarantor: Faculty of Economics and Management, CULS in Prague)
- Game Management (guarantor: Faculty of Forestry and Wood Sciences, CULS in Prague)
- The feedback was obtained on the basis of
- statistical outputs from LMS (Learning Management System) Moodle that is used to provide the educational process
- questionnaire survey (initial and final) within the participants
- interviews with lecturers and guarantors in the consultancy centers

Results

Technological availability

As far as the basic technology is concerned, high-quality internet connectivity represents a crucial limitation and prerequisite. Internet quality requirements vary according to the individual elements of virtual education. While streamed video is the most demanding from a view-point of transmission quality, particular lectures set up a basic structure of the whole education system. With regard to group projection, there is a need for higher quality resolution, it means for a bigger amount of the data transmitted.

From the very first experiments with the virtual education, there have been problems arising from the video transmission quality in some consultancy centers.

Other components of virtual education – syllabi, tests, communication and seminar papers - are not so demanding as for the transmitted data amount and though do not bring any fundamental problems at present.

Due to the above-mentioned connectivity problems, transmission possibilities of the individual consultancy centers (especially of the newly developing ones) are checked. The video format is 682 x 384 pixels (16:9) which means that the minimum constant transmission speed of 1 Mb/s needs to be secured during all the presentation.

The following figure shows a division of consultancy centers according to the municipality size:

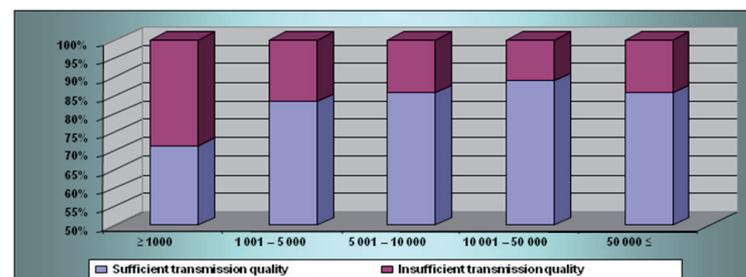


Figure 3: Comparison of internet connection quality in consultation centers (in % according to municipality size – number of inhabitants)

The technology used influences the security of transmission quality the most. In the examined sample, only the WIFI and ADSL technologies are used. Despite the declared connection

quality that should theoretically secure sufficient transmission quality, the reality is different (Figure 3). It is also necessary to mention at this point that consultancy centres representatives claim to use the best available technology in municipalities with up to 10, 000 inhabitants. Insufficient quality in centres with more than 50, 000 inhabitants is caused by adopting rather cheaper technologies than the best available ones.

Problematic availability of high-quality video in some centers, especially in smaller villages, could be resolved by recording and sending a DVD. It is a non-system and unfortunate solution, however, the only feasible for maintenance of the overall accessibility of the Virtual University of the Third Age.

Computer literacy

While talking about computer literacy in the VU3A, it is necessary to distinguish between two groups: contact persons and VU3A participants.

The computer literacy of contact persons is absolutely fundamental for a successful realization of group education as they provide an essential service such as e.g. connectivity, audio and video projection, problem-solving, troubleshooting etc. Moreover, they have to be able to solve incurred problems under pressure.

Providing consultancy and teaching basic computer skills and LMS are an integral part of contact persons duties and responsibilities. Absence of the above pieces of knowledge and skills can lead to an education collapse in the given consultancy centre.

As for the VU3A participants, at least basic computer skills are an advantage, however, they are not conditional for participation and successful graduation. To overcome initial difficulties,

group work, consultancy and contact persons teaching are extremely important. The group work is an interesting aspect of the whole education process when smaller heterogeneous groups are formed, having various levels of computer skills and different problems to discuss. Participants of such a group enrich each other with their pieces of knowledge and skills. It is already possible to document the ability of educational system mastering. A comparison of abilities at the beginning and at the end of the term is shown in figure 4 and 5.

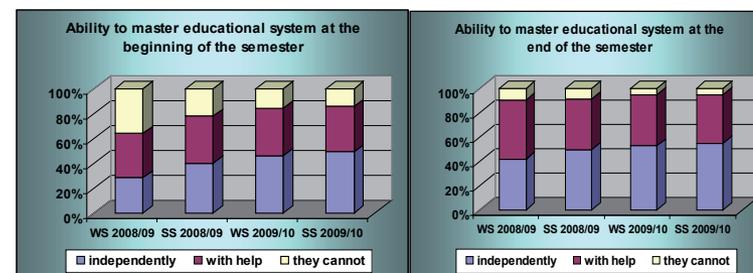


Figure 4, 5: Ability to master educational system at beginning and end of semester

Economic accessibility

Economic aspects of eLearning methods can be evaluated from many different points of view (see e.g. Littlejohn, Falconer, and McGill (2008) or Marengo and Marengo (2005)).

The inaccessibility of the Universities of the Third Age in smaller towns and rural regions is caused especially by economic and time demandingness of contact education in remote places and for smaller study groups.

A comparison of virtual and conventional courses is drawn from a group of consultancy centers that use the VU3A. Only the transportation costs and lecturers remuneration have been taken into account and compared. Other costs (course rooms rent, technical facilities and organizational support) are similar in both methods.

The number of functioning consultancy centers (CC) in particular terms, average commuting distance to CCs, lector payment and transportation costs refunds set by law (6 CZK/km for using one's car) have been calculated.

The average commuting distance is calculated from Prague (173 km). However, taking into account the irregular dislocation of consultancy centers within the Czech Republic, the commuting distance e.g. from Liberec is 228 km and from Olomouc even 264 km. Lectors and lecturers from local universities in these towns and cities contribute to the teaching process too. It means their costs would be significantly higher than the presented example of commuting from Prague universities.

Costs of possible contact education are shown below in figures 6 and 7.

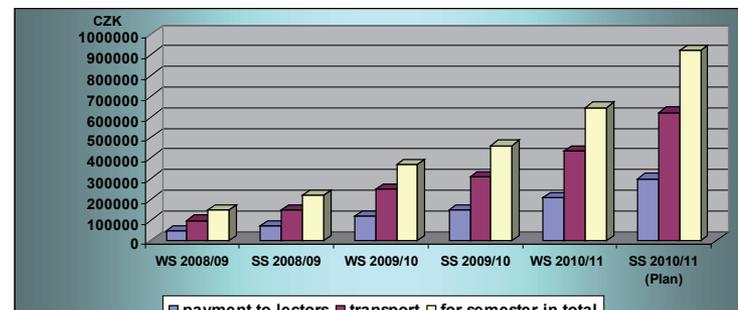


Figure 6: Contact education costs of the University of the Third Age in regions (in CZK)

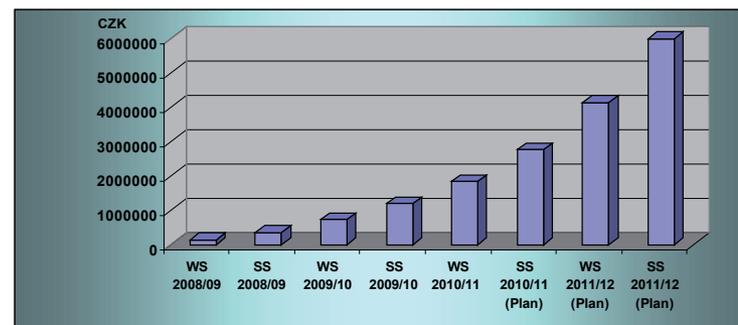


Figure 7: Cost development of contact education of the University of the Third Age in regions (in CZK)

Discussion

In terms of discussions concerning suitability and sustainability of the virtual form of senior education, the following problems have been mentioned the most: seniors' ability to use information technologies and social isolation of individuals in the virtual space. After designing the concept of the Virtual University of the Third Age and using it successfully for two years at the CULS Prague, we can affirm that the above factors do not influence the realized education and its development in a negative way. Let alone, the two difficulties are overcome by this form of education.

Computer illiteracy does not mean excluding seniors from being involved in the education; seniors participate in group lectures where the computer skills are not primarily necessary. Seniors subsequently form work groups composed of various skills degrees – in cooperation with the advanced users, participants who lack the skills and knowledge are spontaneously motivated and taught how to use different educational tools. At the same time, a contact person of the consultancy center is in touch with them and provides all necessary information and consultancy.

Where did you study after the joint projection?

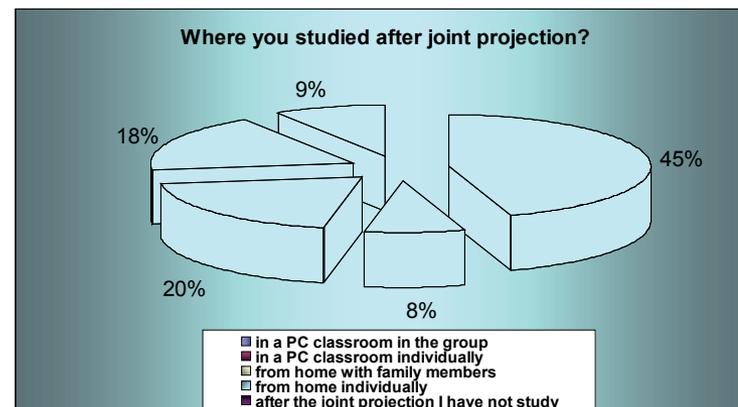


Figure 8: Localization of self-study activities in virtual education

Main reasons for studying the VU3A are the following: acquisition of new pieces of knowledge, keeping in a good mental and physical condition, purposeful leisure time spending and keeping in touch with other people. A positive development is obvious from the answers obtained while asking participants whether they have learnt something new in the courses. 88 % of the interviewed answered positively; which is an improvement of 24% as compared to last year. This positive trend stems from education content improvement and from the increased level of the subject matter explained. The respondents as well valued very positively the technical aspects of projection and understanding of the subject matter. Students were also supposed to evaluate virtual education advantages. Effortless availability of the study and the possibility to study at one's own pace were the main advantages to be mentioned. 9 % of respondents are interested in taking other course in the future.

While comparing the particular results of both monitored years, there is an evident improvement in almost all indicators. The results obtained prove that virtual education at the Universities of the Third Age is suitable for seniors and elderly people as it is adapted to their needs and likely worse health condition. The participants have several options such as e.g. adapting the text size on the internet portal, running the lectures in particular parts, elaborating tests on each topic and returning to the subject matter repeatedly.

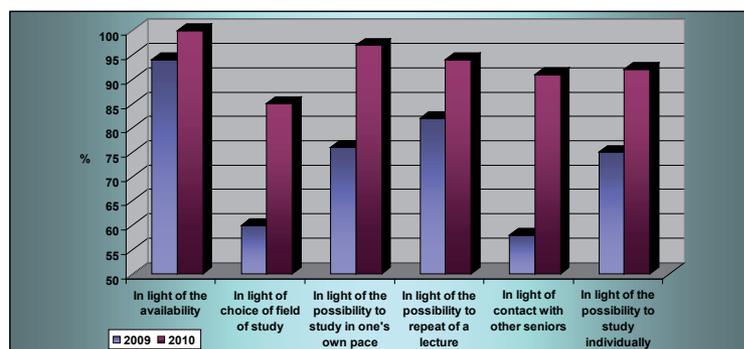


Figure 9: Development of virtual education advantages perception in 2009/2010

The presented computer skills improvement creates a presumption for the development of new forms of increasing computer literacy within senior or other groups. Up-to-now most methods and procedures to increase seniors' computer literacy were focused on more or less conventional teaching of mastering computer and the most common software tools with all their positive and negative aspects (see e.g. Poynton (2005)). The virtual education system in question is not primarily

focused on teaching computer skills. Nevertheless, the results clearly approve a considerable improvement of seniors' skills and knowledge in this area. It deals with a new learning method where knowledge is acquired through spontaneous group work (i.e. through cooperation of more experienced users with the less experienced ones) and communication, as Havlíček et al. (2010) describe.

This system can significantly contribute to the elimination or better to say significant reduction of the so-called digital divide (Jeffrey, 2008; Seong-Jae, 2010), both in senior education (as a solution of general social exclusion) and education in rural areas within the concept "education goes to a learner" where social exclusion stems from the place of residency (Saunders, 2004).

Concerning the multimedia character of the courses while lectures are concentrated in the consultancy centers where they have to be presented (projected) in a desirable quality, the main limiting factor is appropriate connectivity. Not only a sufficient theoretical transmission speed but also its really achieved values and steady parameters during all transmission time. Connectivity problems are being registered in 17.1 % of consultancy centers at present. Considerable differences relate to different municipality sizes. While municipalities with up to 1,000 inhabitants show 28.6% of problematic connections, municipalities with over 10,000 inhabitants record "only" 11.1 % of these. This also illustrates different dynamics of high-speed connection availability in urban areas and in the country.

With the development of broadband connectivity, a gradual qualitative shift towards higher transmission speed can be supposed. The connectivity is or can be as well one of the criteria while searching for and selecting the placement of a consultancy

center, of course together with organization provision and other requirements (appropriate rooms, equipment and so on).

The main contribution of the Virtual University of the Third Age is its unconditional accessibility, i.e. the VU3A can work even there where “traditional” contact teaching of the University of the Third Age cannot be realized especially because of the lecturers’ time potential and commuting to many remote places (consultancy centers). An economic comparison is then to some extent just hypothetical; we cannot compare something that practically cannot happen with something that really works. Nevertheless, the above mentioned savings calculation of travelling expenses and lecturers pay give us at least some economic framework.

A comparison of virtual education and contact education is presented below in table 2.

Indicator	Contact education		Virtual education	
	+	-	+	-
accessibility		bound to a specific place and time	unlimited by place and time 24x7	
communication	personal	unrepeated	continuous, saved for further education	impersonal
comprehensibility		depends on the lecturer, repetition is not possible	vivid, illustrative, use of multimedia, repeatability	
preparation	relatively fast			time-consuming and finance demanding
costs	low initial costs	high costs of repetition	minimal costs of repetition	high initial costs

time demands	low initial	high for repetition (time of a lecturer is a limiting factor of repeatability and extensibility)	minimal for repetition	high initial
technical background	independent			dependence, minimum of facilities
computer literacy	not needed		develops	at least minimal
social aspects	exist		exist in group education	do not exist in individual education

Table 2: Comparison of contact and virtual education (Jarolímek, Vaněk and Šimek, 2010)

Conclusion

Insufficient transmission/communication infrastructure, especially in rural regions, and low computer literacy represent the two main obstacles to a full exploitation of multimedia education in regions. However, the results obtained during the verification lasting for more than two years clearly approve the applicability of virtual education method in senior education; especially in rural regions where the accessibility of contact, face-to-face education is quite problematic and limited.

The application of modern education methods within a group of inhabitants in rural regions, i.e. regions where other educational forms are not economically viable, is the main contribution of the projects solved. Although there is still a certain restraint concerning the use of information and communication technologies, the Virtual U3A can be also considered as a new method of mastering computer skills by senior citizens.

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