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A STUDY OF THE POTENTIALS OF THE DISTANCE LEARNING SYSTEM

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Abstract: Traditional way of education, based on lectures and transfer of content, facts and information in no longer an adequate response to the expectations of students. Today, set of different tasks prepare young people for life and work, because of the speed of the flow of life, permanent inability to attending lectures, this method requires education rooted changes. One of the solutions in distance learning, in which the student and professor of space separated, and information and communication technology enables them to communicate and overcome barriers of time and space. The performance of distance learning depends on the adaptability and the ability of students to adjust their habits with a new way of learning and work. This means that students become as close as possible to information and communication technologies, preparing for the resolution of technical problems, brand new in the way of communication and to play an active role in distance learning and self-taking responsibility for their own progress. This thesis will analyze DLS and will determine how many students have a predisposition for the adjustment mode by distance learning using DLS, as well as which possibilities are to overcome some of eventual difficulties.

Keywords: Education, interactive learning, lifelong learning, ICT

Introduction

The distance learning system (DLS) is an integrated combination of information and communication technologies (ICT) and other educational technologies which is used in support of teaching by teachers and e-Learning and by students, where distance in terms of space and/or time exists between them.

A spatial and temporal distance between students and teachers can be overcome by way of technologies that enable students to access desired teaching content from any location, at any time. Distance learning can be viewed as an alternative to traditional learning in classrooms, and is particularly important for students who wish to learn from home, at their own pace, in their own time (*Kung-Ming, Khoon-Seng, 2005*). In this way students can spend the day at work, and complete their school-related obligations in the afternoons or evenings. They can also save the money they would otherwise spend to cover travel expenses or the costs of renting an apartment if they live far away from university centers.

This topic covers several different analyses of the distance learning system, from historic development, through the importance of distance learning, its advantages and disadvantages, to the features of DLS. An important part of this study comprises the technologies themselves, the elements and architecture of the system, with an overview of the platforms used in this form of education, and an analysis of the implementation of DLS in the Republic of Serbia. The final chapter relates to student research conducted at our University, in the interest of understanding and accepting the new and following global trends in education.

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Overview of Basic Terms

A number of terms are in use in professional literatures, which are frequently even used interchangeably: distance education, distance learning, e-education, or e-learning. Are these indeed terms with the same meaning, or are there in fact differences between them?

One opinion is that distance education encompasses both teaching and learning, with these processes taking place at different locations. Thusly interpreted, distance education is a broader term than distance learning, because apart from learning it also includes the teaching process. However, many use these two terms as synonyms (Mandic, 2005).

Because the teacher and the students are not at the same location, the learning process, as well as their mutual interactions, takes place by way of computers (Blažić, 2007). Besides a distance in terms of spatial dislocation, distance education can also be characterized by temporal distance. Therefore, depending on the type of interaction, there are two categories of distance education: synchronous and asynchronous (King et al, 2001).

Distance Learning System (DLS)

The distance learning system (DLS) is an educational process with several participants, teachers and students, who use ICT for one or more purposes: communicating, transferring content or giving and taking tests.

Teachers and students can be spatially distant from one another, and do not have to be active at the same time. In order for education to be in accordance with this system, not everything necessarily has to take place via the Internet. It can be combined with teaching in classrooms or in computer classrooms.

The development of the *distance learning system* has reached a critical point in the world today. The study programs of a large number of globally renowned higher education institutions now include the distance learning system as a mandatory option for contemporary education.

The *distance learning system* is based on the use of modern ICT in almost all elements of the learning process. *DLS* is generally intended for educational institutions, and equally for all organizations that carry out personnel trainings.

Learning by way of a computer network via the Internet, or via Intranet, comprises the basic concept of DLS. The Internet, or Intranet, is used to provide the necessary requirements for user interaction with content, teachers (authors) and other participants in the distance learning model.

Architecture of the Distance Learning System

The multimedia systems for the distance learning system feature a complex architecture. The choice of architecture is the most important part of the delivery process for such a system, because it directly impacts functionality and features. This study provides a description of an architecture that meets the requirements for a modern distance learning system (Beck et al., 2004; Jankovic, Rajkovic, Vuckovic, 2005).

The entire architecture is divided into four parts (Figure 1). The first part comprises databases and knowledge bases where all the data necessary for the knowledge transfer process are stored, as well as the software components that ensure their maintenance. The second part comprises so-called wizards for creating tests, lessons and tutorials, and the databases where they are stored. The third part is the basic e-learning application used to provide the necessary data (lessons, tests) to the users, and in the background to monitor the progress of each individual user by maintaining various statistics. Along with this application, this segment also includes a so-called metadata manager, which provides an interface to the knowledge bases. All this is, of course, accompanied by a complex authorization and authentication system with clearly defined privileges, which, along with the user portals, comprises the fourth major segment of the distance learning system. The role of external information systems is to fill the databases with real values which provide users with actual insights into the terms they are studying during the learning process. An example of an external information system that could be used is a system that monitors laboratory measuring instruments, collects data from these instruments and enters them into the database. Later on, when a lesson is created, such data can be used as a real-life example for illustration purposes (Beck et al., 2004).

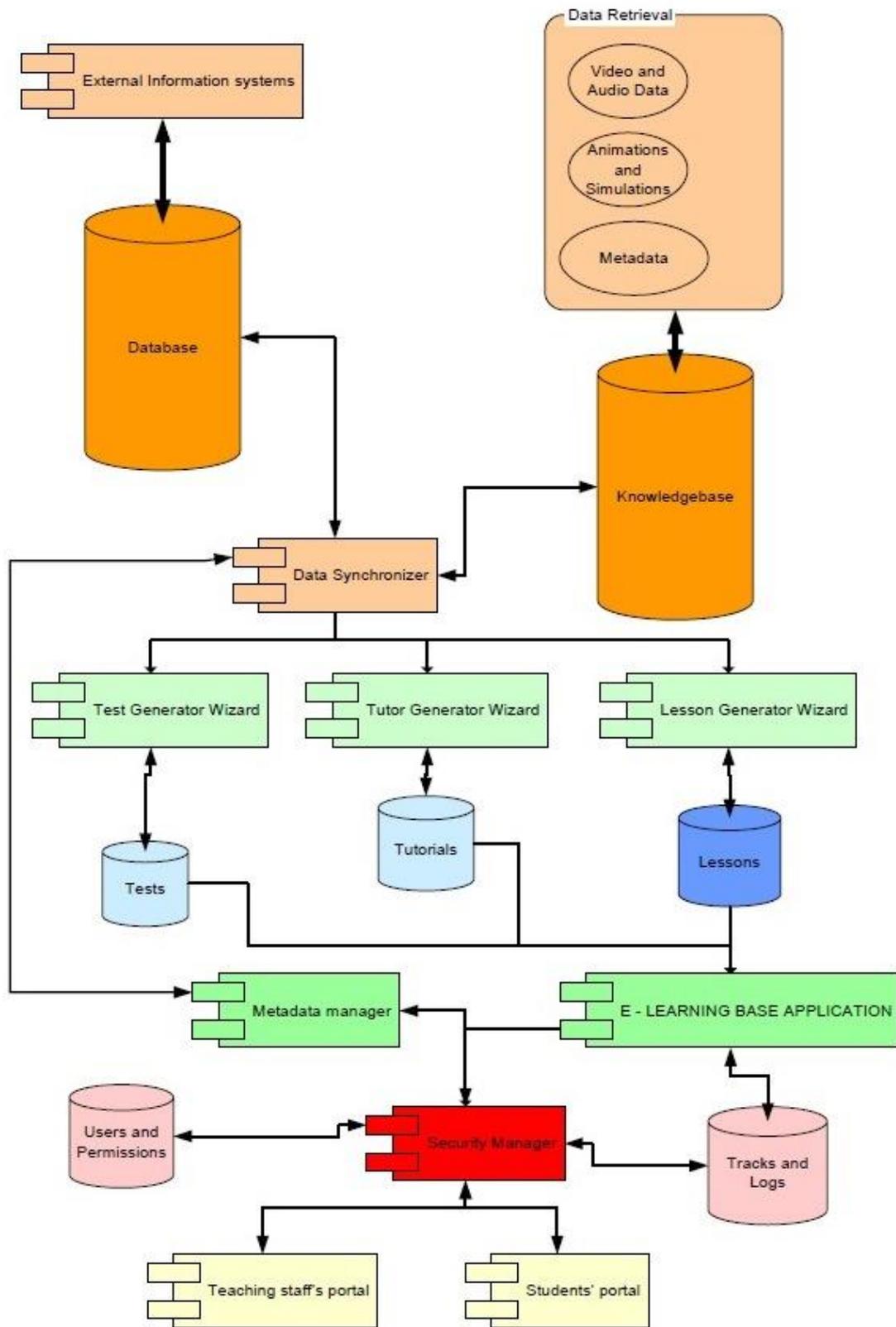


Figure 1. Architectural solution for a complex distance learning system

Elements and Features (Options) of the Distance Learning System

The basic elements of a *distance learning system* which comprise the core of the system and enable it to function flawlessly are:

1. The *distance learning system* portal;
2. The *distance learning system* platform;
3. Video conferencing;
4. Support.

The Distance Learning System Portal

The *distance learning system* portal is in our circumstances a bilingual system that provides: notifications, information on courses, teachers, schedules of lessons and consultations, exam dates, results of preliminary and full exams, web services (forums, RSS, searches, site maps and the like), an e-library (access to lesson material, textbooks, practice-class material, software, assignments, exam questions and other material), pages relating to courses, video content, information on certificates, user instructions (how to log on to the system, how to use the desktop, student tools, platform, e-mail and other content) and all other necessary information (Despotovic, Savic and Radenkovic, 2005).

The Distance Learning System Platform

The *distance learning system* platform is an information system for managing the learning process which encompasses various mutually harmonized modules (administrative module, module for creating course content, learning management module, student testing module and so forth).

The DLS platform enables two user interfaces:

- *Content Management System* – a system for managing content (interface for teachers, associates, administrative and other staff);
- *Learning Management System, LMS* - a system for managing learning (interface for students and other users).

The *distance learning system* platform, used to conduct the distance learning, comprises the following systems:

- Learning system
- System for creating course content;
- System for preparing the course - course navigation;
- Tests system;
- System for monitoring student progress;
- System for monitoring student status;
- Communication and notification system;
- Statistics and report system.

The subsystems of the basic elements of the *distance learning system* platform which form its support structure and facilitate the fitting of all the component parts of this complex system into one functional whole are:

- Subsystem for logging users;
- Subsystem for logging time spent using the system;
- Subsystem for creating and managing courses;
- Subsystem for creating and entering study material;
- Universal subsystem for viewing material and uploading content to the platform;
- Subsystem for user navigation through the course;
- Tests subsystem;
- Points and grades subsystem;
- Usage monitoring subsystem;
- Subsystem for organizing courses;
- Communication and notification subsystem;
- Authorization and access hierarchy subsystem;
- Quality subsystem;
- Search subsystem - tree and knowledge base (glossary, FAQ, search).

The software platform of the distance learning system mainly comprises two mutually connected parts. One part of the platform is intended for use by students, and the other by teachers and system administrators (Stanković, 2006).

Video Conferencing

With the help of installed modern video equipment and multimedia systems, teachers can record multimedia presentations that can contain media-rich content and data and can improve lessons and student interactivity during video conferencing. Video content is located on a web server, from which students can access the video material (Jankovic, Rajkovic, Vučkovic, 2005).

Support

Support to DLS is provided by the student service, technical support and other resources.

Principal Advantages of the Distance Learning System

- *The distance learning system* introduces the concept of *e-learning* to educational institutions and all organizations that organize personnel trainings. The distance learning system enables distribution and accumulation of knowledge via the Internet or Intranet - thereby eliminating spatial and temporal barriers, characteristic for the traditional teaching and training process. Persons accessing the system learn individually, whenever and wherever, at their own preferred speed.
- *DLS* fully meets the requirements of different user groups: course creators, instructors, administrative staff and course attendees (university students or employees). The distance learning system is an extremely flexible system which enables lecturers to create courses and themed seminars for a broad range of requirements.
- *The principal advantages of the distance learning system from the viewpoint of the educational institution are:* expansion of the institution beyond national borders, saving on capacities in terms of space, differentiation from other educational institutions, simplicity of use, following the trends of developed countries, as well as the role of connecting people, knowledge and information.
- *The principal advantages of the distance learning system from the viewpoint of the student are:* the enabling of constant learning, self-organizing their study time, setting their own pace, planning time and the ability to analyze and synthesize studied content, the option to choose highly specialized courses, choosing their study location, lower costs for rent and other expenses relating to living in the place where the study courses are held, the ability to find and hold a job and study at the same time, overcoming absence from traditional lessons because of illness or other problems, etc.
- *The software solution for the distance learning system meets all the future anticipated requirements for holding various kinds of DL courses:* computer courses, foreign language courses, themed seminars, business courses, as well as courses and materials for academic and general education classes, theoretical and methodological classes, scientific and professional classes and professional application classes.

Disadvantages of the Distance Learning System

The disadvantages of distance learning include:

- The greatest disadvantage of distance learning is *excessive time needed to prepare study and test material*.
- *Lack of the social aspect of learning* – during the course of his education the student has contact only with his computer.
- *Technical problems* – the greatest of which is the *authorization problem* – how to make sure that the person on the other side of the “wire” is indeed the person that is supposed to be examined?
- *Many distance learning programs fail*, because a large number of students drop out and never complete the program. At the beginnings of distance learning, the drop-out rate of students was over 60%.

The reason for such a high rate lies in the nature of distance learning, or online learning. As opposed to traditional learning, it is easy to drop out because the student is not expected to participate in the learning process at a specific location where he is joined by other students and a teacher, but instead does so mostly from home. This requires a high level of engagement, self-discipline and motivation in order to diligently complete assigned tasks. Moreover, because of a constant lack of live contact, the student can experience feelings of loneliness and exclusion.

Because of all these problems, it is necessary to pay special attention to student motivation, and to engage professors to act as mentors, monitor the work of individual students or student groups, and provide support and assistance in studying and completing assigned tasks (Stankovic, 2006).

Implementation of the Distance Learning System in the Republic of Serbia

Statistical data show that the number of persons with completed tertiary education in the Republic of Serbia is greatly below the number recommended by the European Union. According to the data from the latest census taken in 2011, the percentage of population in the 15 and over age group with completed tertiary education in the Republic of Serbia was 16.24%, 10.59% of whom held university degrees. On the other hand, all countries of the European Union are aspiring to the goal of 40% of their population having completed tertiary education by the year 2020, meaning that the Republic of Serbia cannot allow itself to fall so far behind, if it wishes to become a part of the European Union.

A Strategy for development of education in the Republic of Serbia by the year 2020 has therefore been prepared, as declared therein, so as to observe the overall development aspirations pursued by Europe, briefly stated in the document "Europe 2020". One of the measures the Strategy envisages is to provide support for increased use of the methodology and technology of e-learning as a complement to traditional learning, through the development of study programs that are executed simultaneously (in the traditional form and as distance learning) and programs to be implemented only as distance learning, and to harmonize quality standards for distance learning with the practice in the world and the European Union. The Strategy also recognizes the importance of distance learning and e-learning programs in adult education, as well as the potential to use e-learning as a way of providing accessibility for individuals with special needs. The problem of employed students is particularly taken into consideration. It was noted that distance learning (online), which is most suitable to them, is limited because of the decision of the National Council for Higher Education, which has determined that the number of distance-learning students should not exceed 30% of the total number of HEI students.

Moreover, higher education institutions that wish to organize education by way of the distance learning system come across other issues as well, such as provisions of the law specifying that students have to take exams in the place where the seat of the faculty they are studying at is located (which was commented on by participants at the Third International Conference on Distance Learning held in Belgrade in 2012). This is a major issue for students who live far away from the seat of the faculty, primarily for students from abroad, giving rise to the opinion that it would be better to permit exams to be taken online and monitored by cameras, or to open special centers where students could take their exams (Stefanović, 2012).

Despite all these limitations, there is a significant number of accredited distance-learning study programs in the Republic of Serbia, both at state universities and at private higher education institutions. According to the data published on April 7, 2017, in the Guide through accredited study programs at higher education institutions in the Republic of Serbia issued by the Serbian Commission for Accreditation and Quality Assurance, 22 higher education institutions are accredited for distance-learning study programs.

As for infrastructure, although some institutions have their own education management systems (e.g. "Metropolitan" University), the most popular and most frequent system in the Republic of Serbia is Moodle, which is used not only by higher education institutions but also by some primary schools, secondary schools, foreign language schools and other institutions, a detailed list of which can be found on the Moodle website. Its popularity was certainly aided by the support of the Serbian Academic Network (AMRES), which has fully adopted Moodle as its principal platform.

Research

Research Organization

Based on all of the above, a research was conducted at Alfa BK University in Belgrade to find out students' opinions relating to distance learning via modern information and communication technologies, whether they are prepared for independent (lifelong learning), and to assess the potential for overcoming certain difficulties. 277 students from all faculties and all years took part in the research at the premises of the University in Belgrade and in consultation centers in Zubin Potok and Novi Pazar. They were presented with a questionnaire with two groups of questions. The first group contained questions relating to „*Students' habits and organizational capabilities*“, while the second group contained questions relating to their willingness to use *information and communication technologies*. The students were offered a choice between 5 answers, each with an assigned grade:

- Completely agree 5
- Agree 4
- No answer 3

- Disagree 2
- Completely disagree 1

Research Results

The results of the survey of students' opinions relating to "Students' habits and organizational capabilities" are as follows:

- Statement 1: "I am capable of organizing my time so as to fit in my school-related obligations with my other obligations", gave the following results: 37.91% (105) of the students replied that they completely agree with the statement, 46.93% (130) of the students replied that they agree with the statement, 7.58% (21) of the students had no answer to the statement, 5.05% (14) of the students disagreed with the statement, and 2.53% (7) of the students completely disagreed.
- Statement 2: "Interaction face-to-face is not very important to me", gave the following results: 10.11% (28) of the students replied that they completely agree with the statement, 22.02% (61) of the students replied that they agree with the statement, 15.52% (43) of the students had no answer to the statement, 33.94% (94) of the students disagreed with the statement, and 18.41% (51) of the students completely disagreed.
- Statement 3: "I am usually correct in assessing the amount of studying I require, and I know when I have understood the material", gave the following results: 35.02% (97) of the students replied that they completely agree with the statement, 46.21% (128) of the students replied that they agree with the statement, 9.03% (25) of the students had no answer to the statement, 6.14% (17) of the students disagreed with the statement, and 3.60% (10) of the students completely disagreed.
- Statement 4: "I can plan my studying and my obligations relating to the course in advance", gave the following results: 19.13% (53) of the students replied that they completely agree with the statement, 42.60% (118) of the students replied that they agree with the statement, 16.97% (47) of the students had no answer to the statement, 15.16% (42) of the students disagreed with the statement, and 6.14% (17) of the students completely disagreed.

The results of this survey are tabulated in Table 1:

Table 1. Overview of obtained results in number and percentage form regarding students' opinions relating to "students' habits and organizational capabilities"

Survey Questions 1 - 4	5		4		3		2		1	
	No	%	No	%	No	%	No	%	No	%
Statement 1	105	37,91	130	46,93	21	7,58	14	5,05	7	2,53
Statement 2	28	10,11	61	22,02	43	15,52	94	33,94	51	18,41
Statement 3	97	35,02	128	46,21	25	9,03	17	6,14	10	3,60
Statement 4	53	19,13	118	42,60	47	16,97	42	15,16	17	6,14

The obtained results indicated that the students are capable and willing to organize and plan the time required for distance learning via modern information and communication technologies, although face-to-face interaction, i.e. direct contact and communication, is, however, very important to them.

The results of the survey of students' opinions relating to willingness to use ICT are as follows:

- Statement 5: "I look forward to learning and using new technologies regardless of how familiar I am with them", gave the following results: 40.43% (112) of the students replied that they completely agree with the statement, 37.18% (103) of the students replied that they agree with the statement, 14.80% (41) of the students had no answer to the statement, 5.05% (14) of the students disagreed with the statement, and 2.53% (7) of the students completely disagreed.
- Statement 6: "I have no problems with downloading and installing software", gave the following results: 56.32% (156) of the students replied that they completely agree with the statement, 23.10% (64) of the students replied that they agree with the statement, 9.39% (26) of the students had no answer to the

statement, 7.58% (21) of the students disagreed with the statement, and 3.61% (10) of the students completely disagreed.

- Statement 7: “I am comfortable with expressing ideas and questions by way of e-mail, forums and chat rooms“, gave the following results: 43.32% (120) of the students replied that they completely agree with the statement, 35.38% (98) of the students replied that they agree with the statement, 10.47% (29) of the students had no answer to the statement, 5.78% (16) of the students disagreed with the statement, and 5.05% (14) of the students completely disagreed.
- Statement 8: “I am capable of taking responsibility for getting the necessary assistance I need for the study course, by asking other students and teachers questions“, gave the following results: 31.41% (87) of the students replied that they completely agree with the statement, 46.93% (130) of the students replied that they agree with the statement, 16.24% (45) of the students had no answer to the statement, 3.25% (9) of the students disagreed with the statement, and 2.17% (6) of the students completely disagreed.

As in the previous survey, these results are tabulated in Table 2:

Table 2. Overview of obtained results in number and percentage form relating to willingness to use information and communication technologies

Survey Questions 5 - 8	5		4		3		2		1	
	№	%	№	%	№	%	№	%	№	%
Statement 5	112	40,43	103	37,18	41	14,80	14	5,05	7	2,54
Statement 6	156	56,32	64	23,10	26	9,39	21	7,58	10	3,61
Statement 7	120	43,32	98	35,38	29	10,47	16	5,78	14	5,05
Statement 8	87	31,41	130	46,93	45	16,24	9	3,25	6	2,17

The high degree of student IT literacy and their willingness to learn new content would enable unhindered access to content offered by distance learning systems by way of information and communication technologies.

Research Conclusion

The results obtained by this research have merely confirmed and verified the fact that today’s educational process, i.e. teaching, cannot be imagined without the use of information and communication technologies. Lacking experience in work with the distance learning system, students attach importance to face-to-face interaction, but based on students’ habits, their capability to organize their studying, and their possession and use of information and communication technologies, we arrive at the general opinion that students are capable and willing to organize and implement learning by way of the distance learning system. This can best be shown in chart 1, where Statement 2 relating to the claim regarding the importance of face-to-face interaction displays results completely different to the results for the other Statements.

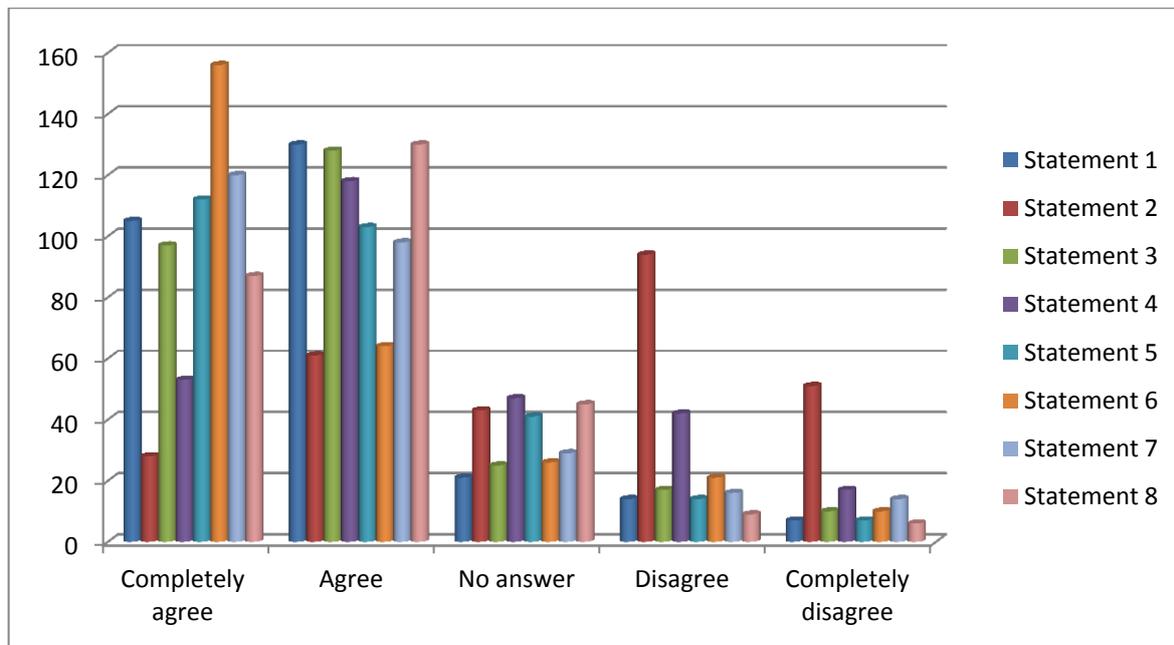


Chart 1. Overview in number form regarding student answers to Statements 1-8

Conclusion

The distance learning system is designed so that the content follows the study program for the relevant study course, but the use of hyperlinks would provide the option to study individual topics more thoroughly, which would suit the individual interests of the students and all others who would use such didactic material for the purposes of formal or informal education.

Such content would be particularly interesting in the field of ICT, management, macro-economy and other fields studied by future managers, and teaching theory, which would be of interest to all primary- and secondary-school teachers, as well as to parents.

Public access to the web portal would popularize distance learning, and hyperlinks to interesting websites would popularize learning foreign languages and raise in people the awareness that using the Internet enables them to access almost all information relevant for their education, or to be better informed in the areas of their interest.

It is also necessary to continuously evaluate the distance learning system and to improve it in accordance with changes taking place in developed countries worldwide, as well as on the basis of experience gained and opinions reached by teachers and students in practice. Public access to web content necessitates protecting the privacy of student data, wherefore a separate database containing information on the students is envisaged, which would be password protected and accessible only to authorized persons. The file containing student progress results must be protected and archived, not just for privacy protection reasons, but also to avoid any potential misuse by the students. However, at this initial stage, evaluation of student knowledge by way of the distance learning system would only comprise additional information for the teachers, and not be the sole source of information, so it is inevitable that a new organization will emerge during the exploitation period which will be suited to the social environment we live in.

The aim of this study is to convey the importance of the distance learning system, and to present a system that would be used in the process of transfer of knowledge and lifelong learning.

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