Distance Education Models and New Communication Trends in Education

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Last decade's technological developments in the field of information technology have boosted its range of uses in distance education and given new dimensions to this type of education. Distance learning nowadays is practised in several theories, each differing from the other in its formal access, in the analysis of its teaching and learning materials, in its methods and range of counselling and the range of its communication with participants, as well as in its didactic concept of preparing and forming learning materials, etc. Distance education is an important criterion for new communication trends in education. Therefore, it shall be covered more thoroughly in this work.

Key words: Distance learning, distance education, distance teaching and learning models, didactic models, communication models, web-based education, web-based learning material

Modeli izobraževanja na daljavo in novi komunikacijski trendi v poučevanju

Povzetek: V zadnjem desetletju je napredek na področju informacijsko-komunikacijskih tehnologij odprl nove možnosti poučevanja in učenja na daljavo in s tem dal temu področju nove dimenzije. Z izobraževanjem na daljavo se danes ukvarja množica teorij, ki se medsebojno razlikujejo po formalnem pristopu, po analizi gradiva, po obsegu in načinu svetovanja in komunikacije z učenci, po didaktičnem konceptu priprave in oblikovanja gradiv itd. Izobraževanje na daljavo pomeni tudi pomemben kriterij komunikacijsko – didaktičnih trendov v izobraževanju, ki jih bomo v tem prispevku analizirali.

Ključne besede: Učenje na daljavo, izobraževanje na daljavo, modeli učenja in poučevanja na daljavo, didaktični modeli, komunikacijski modeli, spletno izobraževanje, spletno orientirani učni materiali,

1 Introduction

The results of sociological as well as pedagogical and psychological research (Gerlič, 2000) in our country indicate an increasing tendency toward changes in the field of education, with an increasing amount of interest in school reform(s) being recorded throughout this part of the world relating to well-developed educational systems. Political, economical and technical changes, as well as the development of the democratic society, have led to the need for some crucial changes in the existing school (educational) system, which – in its present situation – often finds itself in a state of social, pedagogic (educational) as well as financial crisis. Some of the most developed countries find themselves today on a firm course toward a developmental phase called *information society*. This new type of society tends to solve the problems of industrial production coming to a halt through a mass introduction of robots and computers, as well as through the powerful development of education and research. Such a society puts much emphasis on the role of the process of providing the educational system with informational technology when introducing modern information and communication technologies as well as when searching for more modern and more innovative forms of learning and teaching (Roblyer, Edwards & Havriluk, 2001). A society such as this feels and is increasingly becoming aware of the changes in its own society and in the human activities that indicate the need for an improvement of the existing educational systems as well as the adjustment of the latter to modern needs in the educational process. The solutions that are on their way or that are already available in the field of telecommunications as well as in the field of information technology make it possible for the experts to establish a number of new forms of educational environment where the process of so-called *distance teaching and learning* is gradually gaining importance.

Distance teaching and *learning* represent the form of direct or indirect education, respectively, where there is a physical or even time-based separation between a teacher

and a learner. The teacher or tutor consequently checks the learner's progress. The teaching and learning materials are communicated over long distances in print format or in electronic form with the help of various media. As Keegan et al. (2003) puts it, distance education and learning represent a form of indirect education that enables the learners to learn in their own (i.e. home) environment or in a distant environment. This form of education is very popular and widely used in the process of permanent education involving people who have already finished some form of formal education and who now want to extend their knowledge and skills or to qualify for some other job or gain some additional skills useful in their work experience. Distance teaching and learning is aimed at all those who want to gain some additional education in their particular field of activities, because the very system of distance teaching and learning is a very flexible one and at the same time enables anonymity over the whole course. That is exactly why we can find people of nearly all ages involved in the process of distance teaching and learning. Thus, this system also represents an important element of permanent, i.e. life-long, learning.

2 Commucinological and ditactic analysis of the development od distance education

Distance teaching and learning around the world boasts a long tradition. As stated by Bregar (1998), it is not something that has been invented recently, but had already existed in some form or other since the eighteenth century, from when the first beginnings of distance teaching and learning can be traced. The development of postal services and printed materials, for example, enabled people living in distant parts of North America to educate themselves on their own without having to attend any of the then rather traditional, remote educational institutions that were beyond their reach. The knowledge that these people gained in this way was – thanks to some appropriate evaluation systems and certificates – valued as formal education. However, it was only in the second half of the nineteenth century that the process of distance teaching and learning started to appear more widely, when the so-called system of *correspondence-based education* was successfully introduced in the USA, Canada, Australia, Sweden, Germany and Great Britain (Gerlič, 2000). The knowledge acquired in this way too was also – thanks again to appropriate evaluation systems and certificates – valued as formal education. The methods used in this correspondence-based education depended greatly on the stage of the development of the mainstream educational forms and educational processes, especially on the development of technology, i.e. technological development. The use of mass media has been on the increase and has contributed greatly to the increasing number of communication channels available, i.e. channels of knowledge and information transfer. The more that educational technology – and the various forms of computer-assisted educational forms, group work and project-based work along with it – has developed, the more the system of distance teaching and learning has opened up and become ready to take on new ways of working. Thus, the process of distance teaching and learning can – according to Taylor (Bregar, 1998) – be divided into four individual generations or periods, respectively, which – in order to present them in a transparent way and in order to make a better analysis – can be united and presented as a system of the so-called didactic models (Gerlič, 2000) as follows:

First-generation model, which is based on the so-called *correspondence models*; where the text is based on the form of a two-way written communication, i.e. on the correspondence between the teaching staff (teachers) on the one hand and the participants of this form of distance teaching and learning (students) on the other. (See the classical didactic triangle shown in Figure 1.)

Second-generation model based on various forms of *multimedia* that represent some new media used in the transfer of knowledge or teaching and learning materials, the purpose of which is to enrich the already existing printed materials, e.g. audiotapes, videotapes, materials for computer-assisted learning and interactive video. Thus, the written or printed materials, i.e. text-based materials, represent only one of the sources, whose importance in the correspondence model, however, has been lost. (See the corrected didactic triangle shown in Figure 2.)

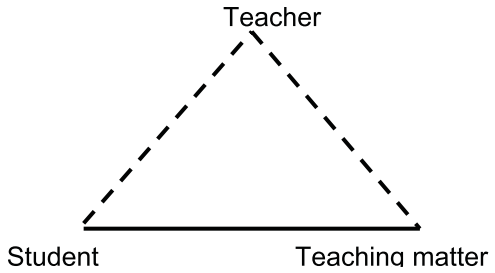

Figure 1: Communicological and didactic 1st generation model of distance education

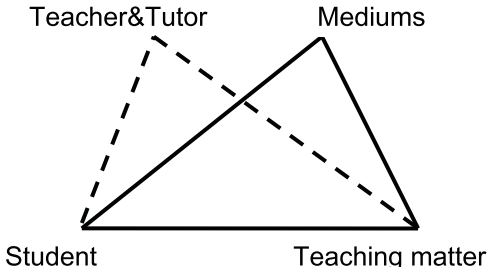

Figure 2: Communicological and didactic 2nd generation model of distance education

Third-generation model based on the systems of *distance teaching and learning* in the literal sense of the term. We can talk about this form of distance teaching and

learning when there are many different sources of knowledge at our disposal (e.g. radio, TV, audio-conferences, videoconferences), which render possible a knowledge transfer over distances that requires on the part of participants a higher and higher level of external and internal interactivity, i.e. communication. (See the didactic square shown in Figure 3.)

Fourth-generation models characterised by *flexible learning*, which is based on interactive multimedia systems, on computer-assisted intranet communication, on an intranet itself, as well as on some of the more recent information and communication technologies (International Knowledge Technologies (IKT)). The current period has seen a much higher level of interaction between individuals, and has done so with the use of various multimedia and Internet-based teaching and learning aids, whose main purpose is to give the learners more independence and greater flexibility in the process of their learning, thus assuring the highest level of external and internal interactivity – i.e. communication – in the didactic as well as the communicological sense. (See the didactic polygon shown in Figure 4.)

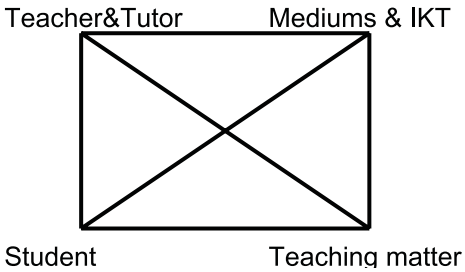

Figure 3: Communicological and didactic 3rd generation model of distance education

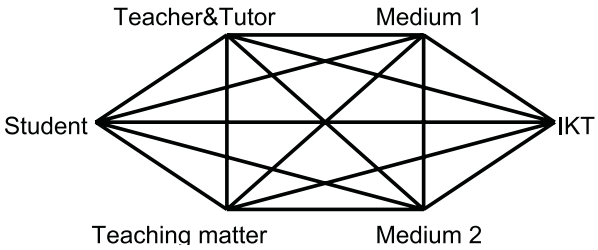

Figure 4: Communicological and didactic 4th generation model of distance education

3 Other important sub-system of distance education

Lessons and lectures in their basic form always represent a deliberate action, i.e. planned and organised forms of education, which particularly holds true in the process of distance teaching and learning: it is *purposeful*, since it determines in advance what the participants should acquire; it is *planned*, because the teaching and learning materials are chosen and arranged into a series of logic and time-bound units, because the educational process follows in its steps the methods and techniques predicted, and because it is aimed at attaining some educational goals that have been set systematically and deliberately. And finally, distance teaching and learning is an *organised* activity, since it is carried out in specific institutions, at a specific place, at a specific time, and is undertaken by staff that have been appropriately trained in their task. Thus, we can show the results of the system analysis of the distance teaching and learning process (Gerlič, 2000) in the form of four crucial interactively interconnected sub-systems: the professional, the technological, the organisational, and the didactic sub-systems (Figure 5).

The professional sub-system of distance teaching and learning is based on the short-term and long-term preparation of teaching and learning materials. It leads to a deeper understanding and mastery of the knowledge and skills by both the teacher and participant. The participant is not supposed to master all the knowledge at the expert level only, but he/she should also be able to operate with the knowledge given to him/her in the same way as his/her tutor (teacher), who – on the other hand – is (or should be) able to pick out from a huge mass of data and knowledge the particular bits and pieces that may be of great help or interest to the student. Thus, it is the ability to choose accurately particular information out of a huge quantity of knowledge and

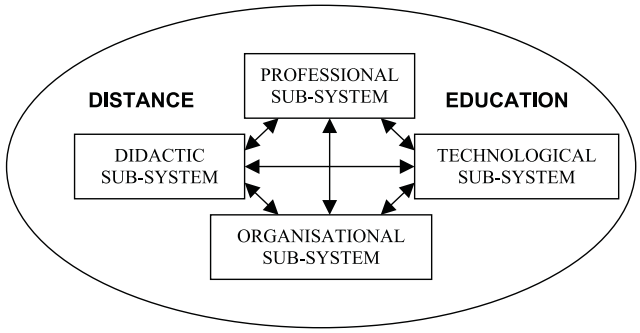

Figure 5: Sub-systems of distance education

the ability to transfer this particular information to the participant(s) that is of utmost importance, as well as the ability to deliberately make such pieces of information an integral part of the curriculum that – on its part – determines which subjects should be taught and the order in which these subjects should be taught as well as how much time should be given to them. Here, we also have to bear in mind the *lesson plan*, which helps realise the aims stated in the curriculum by assigning within each individual subject the extent of the knowledge that should be acquired by the student in this particular subject, as well as by rendering possible the correlation of individual subjects. Thus, the professional sub-system is based on scientific accuracy and correctness and, furthermore, on the suitability of the teaching and learning materials as well as on the process of systematisation. It is also based on the level of respect paid to the learner's developmental stage

and on its capability of establishing a link between theory and practice. It also indicates the possibilities of coordinating individual subjects, as well as the evaluation and enhancement of the learner's progress and success. It is exactly this last requirement that is of utmost importance, since it is based on the learning process, which must be

- reasonable (i.e. it must be based on the learner's understanding);
- economical (i.e. it must lead to the desired goal in the shortest period of time possible and with as little energy and financial means used as possible, which, however, must include the use of appropriate teaching and learning aids);
- real (authentic; i.e. it must be closely connected with the environment in which it takes place);
- rational (i.e. it must lean on the theories of the psychology of learning, which recommends certain appropriate techniques of the acquisition of knowledge); and
- evaluation-based (i.e. the teaching and learning process must include certain different ways of evaluating the extent of the knowledge acquired by the learner).

The technological sub-system of distance teaching and learning is based on the recent idea that the quality of distance teaching and learning depends on the educational technologies used, which can basically be divided into two groups: the *developmental technologies* on the one hand, and the *teaching technologies* (Scheffknecht, 1999) on the other.

In the course of the development of the teaching and learning process, the technology is made up of the software and the hardware that are used in developing and preparing the teaching and learning materials and that thus determine

- the final products (various types of teaching and learning materials used in the process of distance teaching and learning, e.g. printed materials, web-based materials, sound-based materials, videos);
- the program tools needed for the construction of the entire course of distance teaching and learning or its components, respectively (programming languages, graphic tools, multimedia tools, authoring systems, etc.);
- the program tools enabling the execution of the processes of distance teaching and learning; and
- the basic hardware needed for the production part of the development of teaching and learning materials.

In the course of the transmission of the teaching and learning process, the technology is made up of the software and the hardware that analyses and determines globally the following:

- The basic teaching and learning goals, which we want to reach in the process of distance teaching and learning (e.g. active cooperation, management of knowledge, assistance with working processes, asynchrony and synchrony in the educational process, evaluation of knowledge).
- The various types of transmission of educational programmes (transmitting media) and technologies used for the transmission of educational programmes (e.g. traditional, multimedia, web-based ones).
- The software and hardware of the users.

The organisational sub-system is based on the ambition to optimise and rationalise the educational system. Within the production and work processes, however, this ambition is not new – it has already been present and emphasised as well as explored to an increasing extent for some time. The heads of the production firms have already come to the conclusion that only a well-prepared and well-organised working process can run smoothly, without interruptions, being successful in both the economic and the technical sense. Therefore, some of the elements of organisation science have also been implemented in the process of distance teaching and learning. The essence of this sub-system is a comprehensively described methodical and methodological approach that provides for the analysis of all teaching and learning situations as well as an accurately outlined scheme of work (execution) based on this analysis. According to this, Debevc (Gerlič et al., 2002) divides the experience gained in this field into the following three distance teaching and learning models:

- The model of independent education;
- The model of a distributed classroom; and
- The model of open and classroom-based education.

The model of independent education (Figure 6) represents one of the most interesting and current models of distance teaching and learning and is in fact the most frequently used model. In this model, the participants (i.e. the learners) stay at home and receive the teaching and learning materials in the classic or electronic form – on floppy discs or CD-ROMs. The participants also receive a certain amount of the teachers' additional notes and instructions containing hints for the participants as to what the latter should especially be careful about while stud-

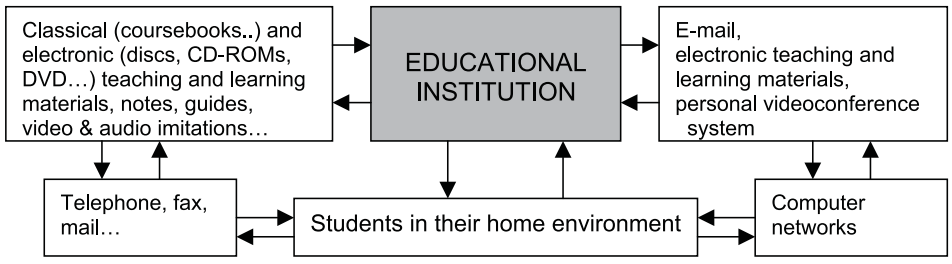

Figure 6: Model of independent distance education

ying these materials and which parts of the learning materials are of greater importance and need to be studied more thoroughly, etc. Teaching and learning materials of a higher level are made up of video and sound recordings of lectures, which can be accessed by the participants at any time, thus making the participants totally independent from any specific time and place in which the process of distance teaching and learning occurs. Owing to the rapid development of information technology, it can be expected that the participants will be connected more frequently via the Internet with school and educational systems as well as information systems.

Indirect communication taking place between learners and teachers can – with regard to what sort of technology the learners can access – be carried out with the help of telephone and/or fax machines, as well as videoconference systems. The process of direct communication, on the other hand, uses traditional postal mail, e-mail, sound-based mail, and – recently – video-based mail. For successful independent learning and to tackle the exercises, the participants can receive special mail packages containing all the elements that are necessary for the participant in their undertaking of the exercises in a particular field or area.

The model of a distributed classroom (Figure 7) is a classical model, where lectures can be transmitted (i.e. broadcast) from one place to many educational centres. Here, an educational institution makes use of several educational centres throughout the country, where the participants of this form of education are assigned so-called tutors who usually help the teachers. The latter occasionally visit these educational centres; however, videoconference systems can be used to establish a connection between the main educational institution on the one hand and the educational centres mentioned above on the other. In such cases, the teacher does not need to travel to individual educational centres. The distribution of teaching and learning materials is the same as in the case of the model of independent education, which means that the participants are given their teaching and learning materials in classical or electronic form. The participants also receive the texts of the lectures and various navigational systems for better orientation in their learning. A higher level of transmitting teaching and learning materials is made up of multimedia-based video and sound clips stored on floppy discs or DVDs or transmitted via the Internet.

The third model – which is the most expensive and thus not as easily affordable for educational institutions – is the *model of open and classroom education* (Figure 8). Here, a teacher presents a lecture that, with the help of a number of video cameras and an efficient video-conference system located in the lecture hall, as well as with the help of a so-called quick network (e.g. multi-channelled ISDN, high-speed optic network or ATM-network), is transmitted (broadcast) to lecture halls in other towns and cities that are also equipped with cameras and videoconference systems. The participants also make use of teaching and learning materials in the classical form that is typical of traditional lectures. This model is – from the teachers' point of view – the simplest, since teaching is undertaken in the traditional way. However, teachers are required to become familiar with working with modern information and communication technologies.

The didactic sub-system of distance teaching and learning is at the core of distance teaching and learning, since it is based on all of the three sub-systems already mentioned. It reflects the performer's, i.e. the teacher's, didactic and methodical and methodological skill and knowledge,

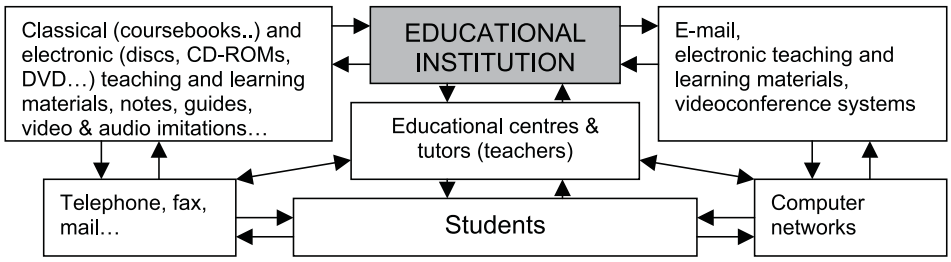

Figure 7: Model of a distributed classroom

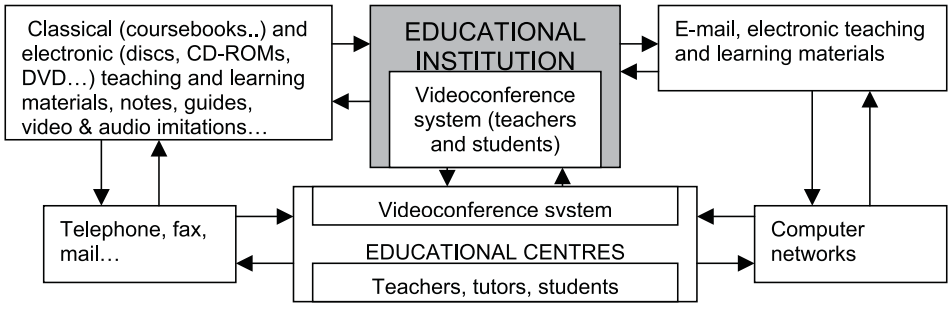

Figure 8: Model of open and classroom distance education

as well as his/her pedagogic surveillance and his/her "art of teaching". Since this sub-system is not as well known, and since not much attention is being paid to it, let us have a look at some of its essential principles or problematic fields, which are as follows:

- An analysis of the distance teaching and learning system as a teaching and learning process (e.g. distance teaching and learning and their correlation with learning, with the learning sources and conditions for successful learning, as well as the stages of learning, etc.)
- The learning and didactic principles in distance teaching and learning
- The choice and arrangement of teaching and learning materials
- The preparation and formation of teaching and learning materials (the traditional as well as the electronic kind)
- The internal organisation of distance teaching and learning (the teaching methods and the teaching forms and techniques, as well as the structure and articulation of an individual teaching and learning unit)
- The internal organisation of distance teaching and learning (the teaching and learning environment, the communication techniques, the teaching and learning aids, the didactic and organisational requirements, etc.)
- The special methodology of tutorship
- The evaluation of learners' progress and the prevention of bad results
- Evaluation and grading
- The information and communication technology used in the process of distance teaching and learning, etc.

4 Conclusion

As can be seen in this short analysis, distance teaching and learning represents a process that is extremely detailed and complicated and that requires a *team-based approach or work* at each stage of its preparation, execution and evaluation (Rowntree, 1994). The need for team-based work or a similar approach is determined by the complexity of the problems and the complexity and variability of the knowledge, as well as the increasingly swift changes occurring in the fields of professional careers, technology and organisation, and particularly in the field of teaching and methodology.

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