ПЕДАГОГІКА   PEDAGOGICS

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DIDACTICAL BASIS OF DISTANCE EDUCATION
(ДИДАКТИЧНІ ОСНОВИ ДИСТАНЦІЙНОЇ ОСВІТИ)

Стратегія розвитку освіти обговорюється скрізь у світі на рівні урядів, в межах інших міжнародних і міжурядових організацій і робочих груп, неурядових організацій, асоціацій учителів впродовж минулих років. Одним з варіантів підтримання такого розвитку є використання Інтернету. Зазвичай в Інтернеті використовуються курси двох типів. Перший тип – самонавчання. Другий тип дистанційних курсів – груповий. Для такого дистанційного навчання необхідно мати доступ щонайменше до електронної пошти.

Дистанційне навчання - спосіб навчання на відалі, коли викладачі та студенти фізично є присутніми в різних місцях. Використовуються системи трьох видів. Синхронні системи забезпечують одночасну участь в процесі навчання студентів і викладачів. Асинхронні системи не вимагають одночасної комунікації студентів і викладача. Змішані системи – ті, в яких використані елементи як синхронних, так і асинхронних систем.

При дистанційному навчанні особливо актуальним є врахування психологічних процесів навчання студентів, що лежать в основі освітньо-пізнавальної діяльності людини. Один з них – ефективність сприйняття і зберігання знань. Тому створення освітньо-методологічних матеріалів для дистанційного навчання вимагають розгляду психологічних особливостей сприйняття, пам'яті, мислення, уваги студентів. При цьому слід враховувати зворотний зв'язок між студентом і викладачем в системі дистанційної освіти. Ця комунікація повинна забезпечити психологічний комфорт для студента в процесі навчання. Недотримання навчального комфорту створює різні психологічні бар'єри спілкування і визначає готовність студентом сприймати нові знання.

Отже, для забезпечення ефективного дистанційного навчання, яке стає вагомою складовою концепції сталого розвитку в освіті, необхідно взяти до уваги тенденції технологічного розвитку суспільства (поширення Інтернету) і дидактичних особливостей його застосування, психологічні особливості розуміння інформації студентами та індивідуальним підходом (педагогічні навички) викладачів.

Ключові слова: *сталий розвиток освіти, Інтернет, дистанційне навчання, психологічні процеси навчання студентів.*

Стратегия развития образования с целью достижения устойчивого развития обсуждается везде в мире на уровне правительств, в пределах других международных и межправительственных организаций и рабочих групп, неправительственных организаций, ассоциаций учителей на протяжении прошлых лет. Одним из вариантов поддержания такого развития есть использование Интернета. Обычно в Интернете используются курсы двух типов. Первый тип – самообучение. Второй тип дистанционных курсов – групповой. Для такой дистанционной учебы необходимо иметь доступ по меньшей мере к электронной почте.

Дистанционная учеба – способ учебы на расстоянии, когда преподаватель и студенты физически присутствует в разных местах. Используются системы трех видов. Синхронные системы обеспечивают одновременное участие в учебном процессе студентов и преподавателя. Асинхронные системы не требуют одновременной коммуникации студентов и преподавателя. Смешанные системы – те, в которых использованные элементы как синхронных, так и асинхронных систем.

При дистанционной учебе особенно актуальным является учет психологических процессов учебы студентов, которые лежат в основе образовательно-познавательной деятельности человека. Один из них – эффективность восприятия и хранения знаний. Поэтому создания образовательно-методологических материалов для дистанционной учебы требуют рассмотрению психологических особенностей восприятия, памяти, мышления, внимания студентов. При этом следует учитывать обратную связь между студентом и преподавателем

в системе дистанционного образования. Эта коммуникация должна обеспечить психологический комфорт для студента в процессе учебы. Несоблюдение учебного комфорта создает разные психологические барьеры общения и определяет готовность студентом воспринимать новые знания.

Следовательно, для обеспечения эффективной дистанционной учебы, которая становится весомой составляющей концепции устойчивого развития в образовании, необходимо принять во внимание тенденции технологического развития общества (распространение Интернета) и дидактичных особенностей его приложения, психологические особенности понимания информации студентами и индивидуальным подходом (педагогические навыки) преподавателей.

Ключевые слова: устойчивое развитие образования, Интернет, дистанционная учеба, психологические процессы учебы студентов.

During last years the development of education with the aim to achieve the sustainable progress has been discussed at the level of governments, within different international and inter-governmental organizations and working groups, non-governmental organizations, associations of teachers and other societies all around the world. The use of the Internet is considered to be one of the ways to maintain such development. Two types of courses are usually used in the Internet.

The first type of the distance courses has been designed for self-study. The second one can be used for the group study. So to use this kind of distance study it is necessary for students to have an access at least to the e-mail.

Distance learning (e-learning) is a method of training on distance, when a teacher and students are physically in different places. Three kinds of systems are used here: synchronous, asynchronous and mixed. The synchronous systems provide simultaneous participation of the teacher and students in the process of training. The asynchronous systems do not require simultaneous communication of the teacher and students. The mixed systems are the systems in which the elements of synchronous and asynchronous systems are used.

All psychological processes of training students that are the basis of education and cognitive activity of man should be taken into account at distance learning.

One of them is the efficiency of perception and storage of knowledge. Therefore the creation of educationally-methodological materials for distance learning requires the consideration of the students' psychological peculiarities of perception, memory, thinking and attention. The inverse relationship of a student and a teacher should be taken into account in the process of distance learning as well. The communication must provide a psychological comfort for a student in the process of training.

Lack of such comfort creates different psychological barriers in the communication process and determines a student's ability to perceive new knowledge.

Thus, to provide the effective distance training, that has become the important constituent in sustainable development of education, it is necessary to take into account the technological progress of the society (wide use of the Internet) and the learning strategy application, psychological peculiarities of students' understanding of information and individual approaches (pedagogical skills) of teachers.

Keywords: sustainable development of education, distance learning, psychological processes of training.

Introduction. Development of the education with the aim of achievement of sustainable development is discussed all around the world on the level of government, within different international and inter-governmental organizations and working groups, non-governmental organizations, associations of teachers and other societies during the last years. Declaration, accepted at the World Summit on the sustainable development, which took place in Johannesburg in 2002, reflected the obligation of world state leaders «to create humane, equal-right and attentive to the human problems society, which acknowledge, that every member of this society has its human dignity».

The analysis of recent studies. Education is the foundation of sustainable development; it is said in chapter 36 of summit Programme which took place in Rio de Janeiro in 1992. This conception was proved once more at summit in

Johannesburg. Modern conception of education for sustainable development (ESD) in many points is based on the agreement about development of ecological education, such as Tbilisi declaration (UNESCO-UNEP, 1977), Salonika declaration (UNESCO-UNEP, 1997), and Belgrade charter (UNESCO-UNEP, 1975). It is based on the accepted by the heads of states in 1992 at the UN Conference on the question of environment and development «Bussines of the Day for 21st century» and other important documents.

Universal model of education for sustainable development doesn't exist. Despite the consensus of states regarding the general conception, the approaches to the education in each country differs because of local peculiarities and priorities. Each country should determine its priorities and actions, accents and processes as well, concerning the ecological, social, economical conditions and appropriate ways of problem solution. In different countries and regions of our planet educational courses are being introduced, conceptions and reports are being prepared, but the development of global and regional understanding in this field international organizations started only during the last years.

The aim of education for the benefit of sustainable development – to help students to accept such values, to develop such knowledge and skills, which will help them to choose individual and collective decisions of local and global character for improvement of life quality without any harm for environment and threat for future generations [*Korjakina, 2000: p.61*]. For teacher it means change of mechanical teaching into the creation of the circumstances for active perception of the environment and receiving practical experience by the students. For students – from passive perception of information to its active discovering, critical comprehension, to receiving the experience for practical use, to communication and real actions. For educational institution – to the change of management politics, use of resources, organization of different kinds of collaboration with local societies. It means creation of such educational surrounding, where exists opportunity for [*Khutorskij, 2001: p.48*]:

−to orient in information and to comprehend it critically;

−to express and persist in own opinion;

−to make substantial choice between alternatives;

−to work together, to learn to collaborate and negotiate, to communicate and respect democratic decisions;

−to listen and understand others;

−to forecast the consequences of own actions;

−responsively take part in school and social life.

According to the definition of Brynland Comission «it is such development, which satisfies needs of nowadays, but doesn't threat the ability of future generations to satisfy their own needs». Education must form this conception in the society and do it during the whole life (pic.1).
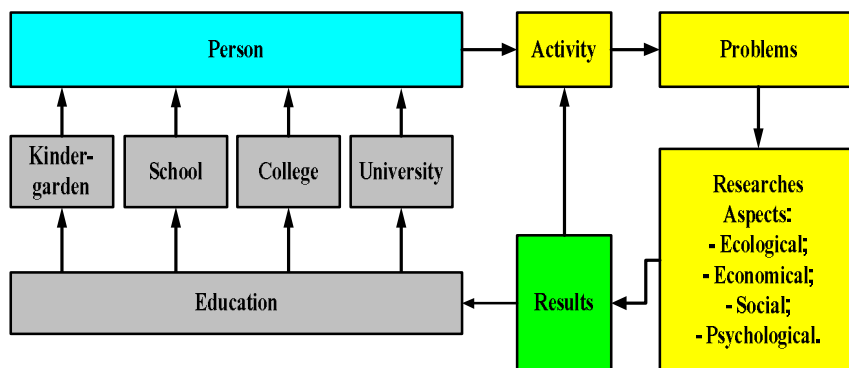
Pic. 1. Provision of education for person during her life

The aim of article is to show didactics bases needed for realization of the controlled from distance education. It is thus expedient to take into account the psychological features of students.

General regulations. One the directions of providing of such education there is the controlled from distance education. Such education will be realized by means of row of variants of connection and communication in society: mail, radio and television, Internet (pic.2). On modern development of society the use of the Internet becomes more effective for realization of the most various educational courses.

It is possible to meet two types of courses in the Internet. The first type - for self-study. The distance course is contained on a site, access to it is free of charge. A student follows instructions, checks up the level of the knowledge, for more deep acquaintance with the proper discipline gets reference to the other sites in the network. There are a lot of such courses in the Internet, their amount permanently increase, but their only disadvantage is, that student does not get any certificate about quality of his knowledge.
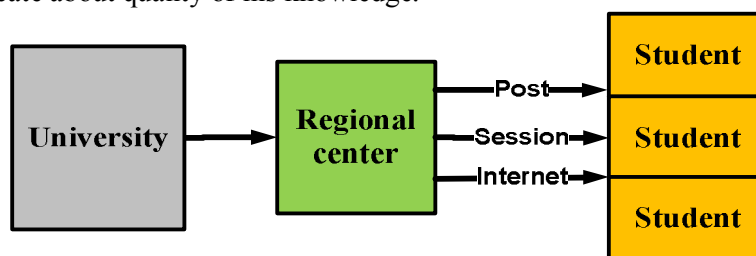
Pic.2. Use of communication in society for provision of education

The second type of the distance course − for the group study. An active exchange of information, by thoughts with a teacher and students is predicted. In this case exists the payment for education, the control terms of studying are set (the term of exams for getting the certificate is determined by a student); such course, as a rule, is included in the system of preparation of specialist of definite qualification (bachelor, specialist, master's degree). In some case it is necessary to give a certificate subject, that precedes the selected course.

It is necessary to have an access at least to the e-mail to study at a distance course. It is desirable to have possibility, at least sometimes, to work in the mode of on-line in the Internet.

The distance course contains such informative materials:

1. Manual or lecture notes.

2. Methodical materials to implementation of laboratory and practical works.

3. Computer educational programs in the Internet, on diskettes, CD-ROM (electronic textbook, supervisory, testing, trainer programs, laboratory works, reference books, encyclopedias, subject-oriented space).

4. Instructional materials.

The distance course contains (pic.3):
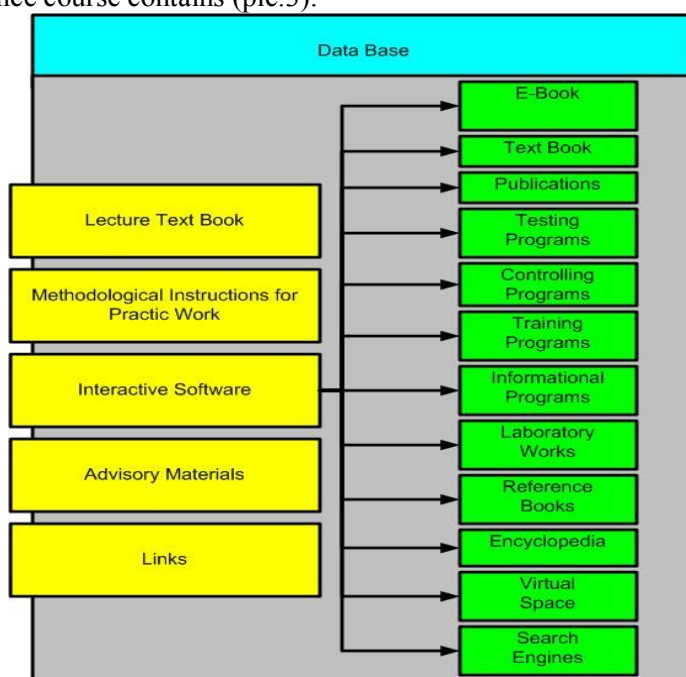
Pic.3. Informational data base of didactic provision of distance educational course

1. Introductory information, where a purpose and task of course are laid out, the schedule, recommendations.

2. Previous self-testing, that will allow the user to estimate the level of the preparation and adapt a course under himself.

3. Recommendations to the study of course.

4. The theoretical material compounded, as a rule, as modules. Such presentation simplifies the learning of material, gives the concrete points of controlling of the learnt material, provides high quality of study.

5. Laboratory and practical works with the previous checking system (admittance).

6. List of the most frequent questions, and answers on them (FAQ).

7. Glossary.

8. List of references to other sites in the Internet for deepening of knowledge of the subject.

The main feature of distance education is the active intercourse of students (рис.4):

– by an e-mail with a teacher and students of virtual group (virtual, because students in the process of learning do not meet in one audience);

– through the list of deliveries or TV conference (discussions, seminars, collective works);

– using chat or videoconferences for the discussion of material in the real time (are not predicted in all distance courses).
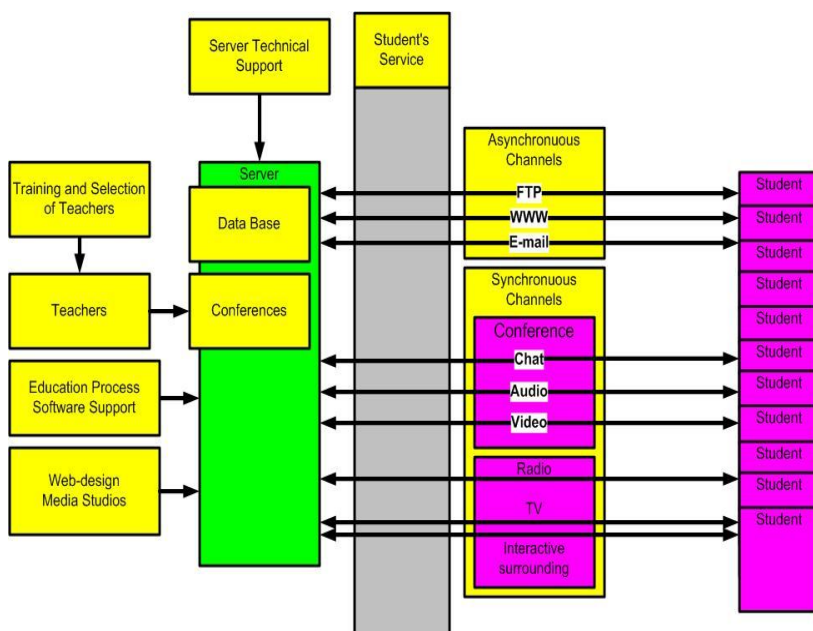
Pic.4. Organization of distance education with the use of Internet

Before the lessons, as a rule, students are to get acquainted with each other. Questionnaires with placing of the obtained information on a server and distribution in the list of deliveries can be used to that aim. It helps students to find a partner for the group task (2-3 persons), to organize the discussion of material and others.

Types of providing of distance education. The system of distance education at the university contains such types of providing:

Methodical - methods, recommendations on technology of distance education taking into account didactic and psychological aspects.

Program – network system programs, computer educational programs, instrumental environments for creation of on-line educational programs. Today for creation of the computer educational programs it is possible to use the

software environments located on different servers (WebCT, First Class and in.).

Technical – the personal computers for server organization, the personal and network computers.

Informative – lecture notes, textbooks, and other methodical materials on paper and magnetic transmitters, reference books, various data-bases on methodical materials, on-line data, shots.

Organizational – normative documents of the state and organizations, determining structures of organizations, which conduct distance education, and international relations.

Modern information technologies of distance education.

Books and printed materials. These means are central in distance education. They have the great number of advantages – it is easy to use, it is easy to carry and etc. Two new types have appeared: printing on demand (small volumes, it is possible to use the pdf format) and electronic book.

Electronic texts and publications. It is a new mechanism of using of information technologies for creation of the printed materials. It is possible to point out two steps of creation: stage to printing (rough copies of content, editing of content, modeling of pages) and after printing stage (printing and delivery). The whole cycle of making has changed and accelerated quantity of acting persons and mediators have diminished.

Appearance of a new type of publication requires creation of new systems, which work with mega-data (information about information).

Computer training. The computer training uses a text and graphic arts, from 90-s the developers added a sound, video and animation. New mechanisms of delivery (CD-ROM) allow to increase the delivery of information at once. Large part is acted by new means of compression of audio- and video information, that simplifies delivery of information.

Multi-media. Large part in the increase of possibilities of multi-media is acted by the author systems. Now the tendency of their development moves toward presentation of materials in the Internet.

Multi-media also develops as entertaining industry. Some consider that combination of educational components with entertaining presentation will appear in a future – edutainment.

Television. It is used by many educational establishments of world as the mean of information. The sizes of tele-production increase and become more technological.

Radio. It was used on the initial stage of development of the opened learning, now it is especially popular in those countries, where television and networks are limited. Presently different local radio stations increased their role in Europe, a great amount of them works in the Internet today.

Virtual reality and design. Virtual reality appeared as a results of the design which is used for the difficult training tasks for soldieries, pilots, operators of power-stations. The fundamental idea of design is the creation of the real situation for a person, that studies. During a few decades the design is executed on the computers, that allows to reproduce different possibilities of

models. But designing and usage can be long enough and demands great efforts. In virtual reality the three-dimensional game is used – mostly in the games. Development of this direction in teaching is still more protracted, than in the design.

Electronic worlds. Basic conception of electronic world is that all resources which are needed for work (information, trenazh) to the man-machine interface. It gives possibility to decide problems, which appear in the process of work in an independent manner.

Broadcasting and audiocassettes. Broadcasting – is synchronous delivery of educational audio materials, which not always can be optimal for some students. Now exists Internet-radio which can become audio-library for users.

Audiocassettes and audio CD are the second asynchronous mean. They are wide-spread and international standards on them exist.

TV coverage and video cassettes. The forms of synchronous TV coverage develop from «old television» to different additional methods (cable, satellite, microwave). New technological decisions appear, such as the high-quality TV (HDTV).

In addition to video cassettes video discs appeared, capacity of which in six times more than CD-ROM, and provides the revision of video image during three hours. Such DVD have a plenty of advantages for education, for example, high quality, searching possibilities, potential multi language paths and others.

CD-ROM. These means replaced diskettes in the middle of 90-s, increasing the volume of information which is saved, in 500 times. It is very comfortable for delivery of audio- and video files.

CD-ROM has an international standard (ISO 9660), that facilitates an exchange by information. It is forecast, that popularity of this mean will grow. Already today users can make the disks.

The internet, intranet. Computer networks become the key means of delivery of educational materials. The heart both of network and intranet is protocol TCP/IP − and this is the main thing.

TV conferences (Skype-conferences). This term has large distribution and includes audio conferences, computer conferences and video conferences. Audio- and video conferences - synchronous; computer conferences are asynchronous.

Audio conferences use ordinary telephone communication and they are very cheap. Video conferences take place between groups, but videos-boards, that can improve communication, are developing during the last three years,.

As to the computer conferences, there are a lot of forms, where text exchange messages were earlier used, now it is possible to apply synchronous communication with the transmission of graphic arts, sliding seats and to link to the audio conferences.

E-mail. The most powerful asynchronous technology, where it is possible to send sheet both to the separate addressees and to the group of people. The list of deliveries can be used for collaboration in matter. At the Britain Open University 5% of educational time students of a work with the video data, 15%

of time - with audio- and video materials and up to 80% of time they work with the printed matters.

Methods of getting of educational information at distance education [*Osvitnij portal*].

Distance education is the mean of learning in the distance, when a teacher and students physically present in different places. Historically, teaching controlled from distance meant the extra-mural teaching. However today – it is the mean of teaching, that uses audio, videos and computer communication channels.

The distance education – is closely connected to the distance education. It is considered that the distance education is the process of transmission of knowledge (teacher and institute are responsible for it), and distance education is the process of getting knowledge (student is responsible for it).

According to the way of getting of information the next systems are distinguished: synchronous educational systems and asynchronous.

The synchronous systems assume simultaneous participation in the process of lessons of students and teacher. To such systems belong: interactive TV, audio graphic arts, computer TV conferences (USENET), IRC (Internet Relay Chat), MUD (Multi User Domain), MOO (Multi-user Object Oriented).

The asynchronous systems do not require simultaneous communication of students and teacher. The student chooses time and plan of employments himself. To such systems in distance education belong courses on the basis of the printed matters, audio/video cassettes, e-mail, WWW, FTP.

The mixed systems – those, in which the elements of both synchronous and asynchronous systems are used.

According to the technical basis of data transmission the next forms of distance education are distinguished:

– delivery of the printed matters by post (typical for the traditional extra-mural learning);

– delivery of audio- and video cassettes;

– by the means of the audio the graphics (Audiographics);

– through interactive TV and video conferences;

– through TV conferences, IRC, MOO, MUD (Internet);

– through an e-mail and letters sending (Internet);

– through the WWW (Internet).

Lately Internet ousts other forms. It is caused by three circumstances:

1. technical development of the Internet-technologies, that allow to imitate any educational model by cheaper and more comfortable means;

2. simplicity of connecting to the Internet;

3. low cost of connecting.

Psychological-pedagogical features of the distance education.

The psychological processes of personality are the basis of educational-cognitive activity. One of them is effectiveness of assimilation and storage of knowledge (pic.5). That's why during distance education it is necessary to stick to them with consideration of specific of distance education.

Any new form of learning, including distance, requires creation of psychological base without which it is impossible to speak about quality of educational process. V. Demcin selects the row of psychological principles which affect quality of distance teaching. He pays the special attention to the necessity of the detailed planning of educational activity, its organization, clear raising of purposes and tasks of learning. Students are to understand setting of the offered courses. An author marks that efficiency of educational activity of students to a great extent depend on the content of the materials which determines a structure and level of their cognitive interests − general or special.

Development of educational-methodological materials for distance education demand the consideration of psychological patterns of perception, memory, thinking, attention, and age features of students as well. It is explained by that fact, that the cognitive processes of students directly affect assimilation of educational material. There is the number of independent of personality characteristics features which is necessary to take into account at the development of educational-methodological materials, in particular:
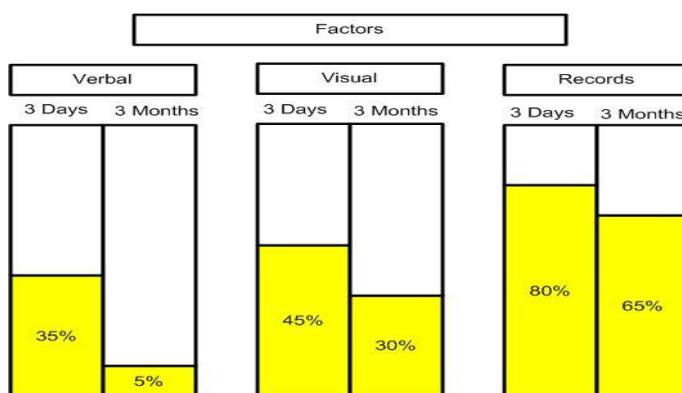
Pic. 5. Efficiency of understanding and fixing of knowledge

− man senses are limited in the possibility to react on informative signals, so the only dosed quantity of reports is consequently perceived from an environment; and if there are too much information, the brain suffers glut of information;

− a man perceives a world depending on that she expects to perceive, that's why its consciousness reacts more on new and unexpected;

− the «effect of the technical saturation» is that a man is not able to execute the monotonous tasks during even the short period of time without any variety, as a consequence he sometimes unconsciously changes the performed task.

Taking into consideration of mentioned above peculiarities facilitate the rise of the level of perception of information and understanding of educational material by those, who studies in the system of the distance education.

The feed-back between a student and teacher in the system of distance education is its absolute attribute. This communication must provide the

psychological comfort to the student in the process of learning. Essence of mechanism of feed-back consists in that fact, that in the interpersonal contact the process of exchange of information doubles in some way and carries in itself from a recipient to the communicator information about the quality of the recipient perception and estimates the conduct of communicator. Adequacy of information perception depends on many reasons, the most important of them is presence or absence of communicative barriers. A communicative barrier is the psychological obstacle on the way of adequate information transmission between partners of intercourse. If such barrier appears, information distorts or its content changes.

There are different psychological barriers of intercourse:

–a semantic barrier which is related to the use of different meanings of the same notion by the participants of the process of intercourse;

–a stylistic barrier appears at disparity of styles of speech of communicator and recipient;

–a logical barrier appears when the logic of thinking, offered by communicator, is very complex.

The communicative barrier can outgrow into the barrier of relations. It the psychological phenomenon which arises up in the process of intercourse of communicator and recipient especially, when the sense of mistrust and hostility to communicator spreads on offered information (pic.6).

It is important to take into account that any information which to come the recipient influence his conduct and thinking. And in particular cases the communicative barrier appears as the psychological defense from the psychological influencing of other man, which arises up in the process of information exchange between the participants of intercourse. Thus, personal characteristics of teachers in the system of the distance education are of the important value for providing of the proper psychological comfort to the studies.

Psychologists pay attention to the ability of student to work independently with information. It is known, that independent work in the system DL is the basic element of educational activity.
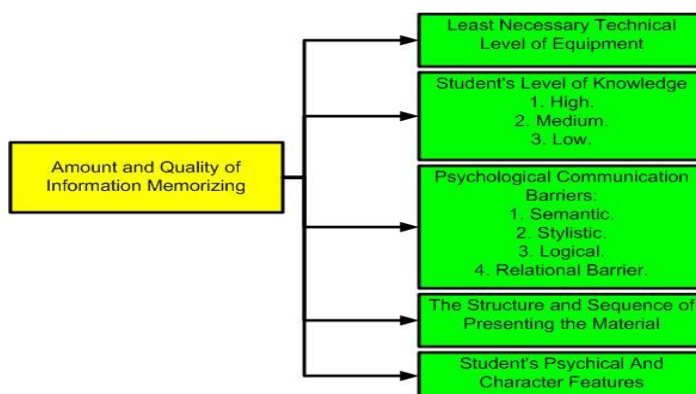
Pic.6. Factors, which influence the amount and quality of information

memorizing

The next *levels of student readiness to independent work* are distinguished:

– high, when a cognitive and professional reasons prevail;

– intermediate, when different reasons are caused by different problems;

– low, when an external reason prevails: necessity to pass the credit or exam.

The main reasons for independent activity may be educational-cognitive and professional reasons. Interests, responsibility, fear of deduction and others like that, can be concrete stimulus. Different reasons variously affect the quality of educational activity.

Such psychological problems as absence of experience of independent work, insufficient volitional self-regulation, influencing of group options etc. can interfere the realization of independent activity.

The main factors which provide the effectiveness of educational environment is considered (On materials of the article of [*Malinco, 2002*]).

– skilled teaching staff;

– pedagogical skills, the aim of which is upbringing and education of person «not to live in the circumstances of uncertainty», but ready to improve and to perfect the social reality and to remove this uncertainty; he person which is able to influence «events». Event is understand as an actualization of qualitative perspectives of social development;

– working out of course with addition of the elements conditioned by application of technological means of learning;

– work of students' services (the feedback on the quality of education).

Conclusions. So, for the providing of effective distance education, which becomes more and more actual according to the conception of the sustainable development in education, it is necessary to take into account tendencies of technological development of society (spreading of the Internet) and didactic peculiarities of their application, psychological peculiarities of understanding of information by the students and individual approach (pedagogical skills) of teachers.

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