Using Adaptive Web Systems for Education Process in the Preparation of Web Programmers

Dr. Aripov Mersaid and Fayziyeva Mahbuba

Abstract— **The current rapid development of informational and communication technologies, and wide-format digital telecommunication means and Internet systems, their wide application in every sphere of society is achieved through widespread networks of WWW and located on a regular basis of current Web project. The main purpose of learning the Web technologies is to give the students scientific and theoretical knowledge on information processing in the managerial information databases using Web technology and integration with the database management system (DBMS). The main task of learning is to form in students' knowledge, skills and experience with database management systems data, to study modern methods of creating Web projects and also their design and creation. This requires the creation of adaptive Web systems, and the development of teaching methods corresponding to the intellectual abilities of the student. In the present article it is talked about the features of adaptive educational web-based system in preparing the web programmers.**

Index Terms—**Intelligence tests, ability of programmers, mine, logical thinking, adapted to the educational system.**

I. INTRODUCTION

In the world it is always paid much attention for talented, intelligent and highly educated students ability as they know the strategic importance of that case. In many countries created good conditions for such talented children. Thus, in the corresponding areas are formed intellectual elite, and that elite work for the development of their country. In order to find out the talents of children there are many psychological research, intelligence tests are used to determine in what area children are talented.

Everyone has the need to study, to get education, enlarge his knowledge, to improve skills in the life. The quickly and the most effective method of the education is the individual studying with the teacher. In this method of education it is taken into consideration psychological availability, interests, talent and demand of the student. This method will accelerate the process of education and helps to save much time for the acquisition of the material. However, this method poses many problems such as fitting the time of teacher and a student and of course the problem of finance.

Usually it is used training systems in the organizing the educational process without a teacher. Nowadays current systems used in the educational process consist of teaching materials, collected static pages or materials in the electronic form. In order to increase the quality of learning and accelerate the educational process it is necessary to create suitable materials for learners, implement the systems which determine the learner's educational trajectory.

First of all, in the organizing the process of teaching (learning) it is necessary to develop a system which checks the individual characteristics of student and then determine the education level of a student. Intelligence tests may be used in order to determine talents, skills, ability and knowledge of the student.

II. IQ TESTS

There are many available different types of tests to determine intelligence quality level and types, and the most common used ones are – Cattell, Binet, Rudolf Amthauer, Raven, Wechsler, intelligence test of Eysenck, Gilford, test of creative potential by Garrens, "creative space" method of D. Bogoyavlenskiy, test of E.Tunik, surveys of Johnson, and there are many other tests. According to open encyclopedia Wikipedia source the most exact and effective tests are D.Wechsler's test, J.Raven, R.Amthauer test of learning intelligence structure, R.B Cattell's tests[5].

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The main point of intelligence tests is to define which type of ability is more developed, speed of the intellectual process and IQ level. For example, Raven intelligence test consists of 60 tasks which measure the speed of the intellectual processes. In these intelligence tests, time is an important criterion and there are 5 units which consist of 12 tasks. Each task consists right cornered matrix in which collected different figures (set of figures), and they are based on the logical integrity and logical legality.

British psychologist Hans Eysenck [4] considers that IQ equals to the ratio of the speed of human intelligence. American psychologist R.B.Cattell created a Sixteen Personality Factor Questionnaire and CFIT (Culture-Fair Intellegence Test) test to define human intelligence. Rudolf Amthauer's test is designed to examine, to learn the type of intelligence deeply, and it defines the most suitable type of profession.

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III. INTELLIGENT FEATURES OF PROGRAMMERS

It is known that, there is no anyone whose intelligence has developed in all areas. Someone is good at mathematics, someone in history, and some are in foreign languages. Any person may have any type of advanced capabilities, and it is normal event. So, of course, a certain task may be very easy for a student, some may be difficult to solve and some may be unsolvable. As a result tests identify the student's strengths and weaknesses, which allows us to define the objective information in which field and area of profession or profile the student is much available.

This article discusses which type of ability is more important to be developed in future computer programmers.

In order to form any professional competence there must be fully defined the quality of abilities. For example, in order to be a software programmer it is not enough to know Internet, working on standard informational technologies, and playing computer games. *First of all*, a strong abstract thinking is required. If one mastered easily algebra and trigonometry at school, lyceum time, then we can say, this reader is ready to be a programmer. *Secondly*, one should have the ability to think logically, in order to think logically well one must acquire the knowledge of physics. *Third*, one must have the structural-linguistic ability in order to acquire various programming languages. That kind of ability will appear if a child mastered the connections of chemical elements and learned well foreign languages. If these abilities hadn't been developed in a student, then student must work on his/her own, participate and study in additional regular training classes, as a result he/she may grow up as an amazing computer programmer.

Following opinions are given about the ability of being a computer programmer in the section "Who are you, Mr. Programmer? Intelligent features of software programmers" of the book "Gifted child at the computer" by Yu.D.Babaeva and A.E.Voyskunsko: "According to the generally accepted point of view, the profession software programmer requires a high level of intelligence development. From other professions software programmer profession qualities are characterized with the following features: to understand the relationship between elements (chemistry) and abstracting them, flexible thinking, critical view to the problem, being talented in design, the ability to analyze and work systematically, readiness to relearn and fulfill the knowledge. As it is known the profession software programmer requires a high developed intelligence quality. The most needed features for software programmers are the following: understanding the relationship between elements, perfect and excellent thinking, and critical point of view, designing, the ability of analyzing and working systematically, to fulfill the knowledge and being interested in study, the presence of verbal and non-verbal thinking components."[1]

IV. USING IQ TESTS ON CREATING SYSTEM ADAPTED TO THE LEARNING PROCESS

According to the statistics, the best test to analyze the type and the level of intelligence is named the IQ test created by Eysenck. (Hans Jürgen Eysenck) However V.A.Vasilev in his article [2] "The best IQ Test" (Dr. of Physics, Mathematics, Academician of the Russian Academy of Sciences, Scientific chief researcher of Institute of Mathematics named after V.A.Steklova) revealed the presence of faults and errors in some variants of Logics and Geometry subtests by Hans Jürgen Eysenck. Intelligence test of R.B.Ketell is linked with intellectual test of the special geometric space materials; J.Raven's Progressive Matrices test determines not the type of IQ but the general level of IQ.

Therefore, in our opinion, it better to use Amthauera tests is suitable in order to determine the individual characteristics of a student. By using Amthauera tests we can identify person's knowledge in social, humanitarian, natural, physical and mathematical sciences, and as well as the ability on specific types of professional skills.

Test is designed for everybody at the age of 13 to 60 years. Test identifies four types of intelligence: verbal, mathematical-logical, visual-spatial and memory. Test consists of 9 subtests.

1st subtest – knowledge (KN). Practical intelligence - "language perception" is checked. Participantof that test must find the appropriate word and complete the sentence.

2nd subtest – removal of excess (RE). The ability of intuitive understanding – abstraction skills are learned. 5 words are given to the participant of the test, and he/she must find the word which is out of other words in meaning.

3rd subtest – finding the similarity (FS). Skills of logical thinking – the ability of distinguishing into groups is tested. 3 words are given to the participant of the test, it is required to find the correlation between the first and the second word. After finding the correlation in connection with 3rd word the 4th must be found.

4th subtest – defining the common (generality) (DC). Identifying the ability of categorizing the concepts. Participants of the test have to find two words with general understanding.

5th subtest – arithmetic (AR). The ability of Mathematical intuition – the development of mathematical thinking is determined. The participant of the test has to solve 20 arithmetic tasks.

6th subtest – defining the regularity (DL). Official(formal)-logical ability – Determining the inductive thought assurances to determine the ability of inductive thinking. The participant of the test has to determine the numerical series and should continue it.

7th subtest – geometric structure (GS). The ability of imagery analysis – determining the ability of visual-spatial imagination. Different pieces of any figure are given to the participant and he/she has to find appropriate figure by given pieces.

8th subtest – spatial representation (SP). Spatial skills – identifying the ability of making imaginary activities with figures in the space. The picture of cube whose state has been

changed is given to the participant. The appropriate cube has to be found from the given pictures.

9th subtest – Remember (R). The speed a logical memory is determinate. Some words are given to the participant, after a short time words are closed. The participant needs to write these words dividing them into groups[3].

There are 20 tasks in all subtests except 4 subtests of methodology, 16 tasks in 4 subtests. all subtests have 20 missions. 4 subtests have 16 mission. The number of all tasks are – 176.

In many areas (for example in architecture, design) creative potential of specialists plays an important role, in others (eg., private business) much attention paid to the communication with people around or educators must be able to contact with people. Not so important role plays the skills as organizing, diligence and educational activity in acquiring various stages of different professions. All of these require special experiments in order to be determined.

In order to be developed as a web applications programmer following abilities are required: editorial ability (Web page data preparation), designing ability (creating style and a design of a web page), layout (creating a web page layout), and the ability of designing code (writing software modules of a web page).

In order to determine software programming ability of a person it is used Amtxauera's 2, 5, 6, 7, 8th subtests. Following abilities are determined in subtests: by 2nd subtest editorial ability; by 5th and 6th subtests it is determined mathematical, logical thinking of the software programmer; 2, 7th subtests helps to define programmer's layout ability, and designing ability is determined by the help of the 2nd and 8th subtests.

It is necessary to the web entrance tests adapted to the educational system which determine the type of intelligence, to be consisted of tests about basic concepts of web technology and tests of common English language. Here intelligence tests help to determine the IQ level of the student, where the tests given on the course web technology helps to determine the level of knowledge in the same subject. The knowledge of the English language education plays an important role in the development of this science as the main elements and terms of the web technology and web programming consist of words in English.

In the starting point of the entrance test it is determined the level of the participant's education knowledge to define from which level he/she will start the study. The web system adapted to the educational process forms the activity and level of knowledge skills of the participant.

After the results of the taken experiments following literatures are given on the abilities and interests of the participants: if editorial ability is determined, then literature about editing is given; if designing ability then literature about web designing and computer graphics are given; for layout ability literature about layout are given; for software programmer it is given different literature dedicated to different programming languages and literature with complex tasks about the science. On creating materials of the science, the notion of system materials would be given from the starting point till the full coverage of the materials of science. It is necessary to pay attention to media materials on the creation of educational materials as they help to acquire the material quickly and briefly.

To study corresponding to the level of modules guarantees the lightness or easiness / hardness; creative learning / productivity of the system modules.

V. PROPOSALS

From the point of view pedagogical technologies, on preparing education modules with many levels it is necessary to pay attention to the following:

- The educational material of the first level should be focused on to educate in sufficient level (the most simple, basic); control tasks and quizzes must be on reproductive character, they must cover nature of the task and the subject and must be suitable as well as the entrance tests.
- the second level must cover the themes, theories, methods, and some of the concepts must be briefer than the first level; control tasks must be depended on the topic, and must be dedicated to solve any problem based on the acquired knowledge on the entrance test;
- The third level of educational materials must be more difficult than the previous levels, this level should make the student to work independently, should be focused on to demonstrate its potential; and control tasks need to explore the knowledge and the ability of the skills must be related to the ability explored on the entrance tests.

Level of the participant's education development mechanism is determined on the results of system modules. Explanation of the automated results of control tasks must consist of algorithm and the level of the acquired material.

Education level criteria is developed by the teacher-developer. Later educational trajectory can be changed depending on the recipient's level of education. For each module (based on its multi-levels) teacher investigates teacher-module structure, illustration materials, and self-control tasks and the final test. In connection with this system module consists of separate topics related to educational goals. Each theme contains lectures and multimedia tutorials related to the lecture. Text materials and multimedia tutorials must be given in separate pages.

The trajectory of the education will change depending on the progress and development of knowledge. After acquiring the level of the given material the knowledge of the participant is examined. If the recipient does not pass the examine then he/she has to reacquire the material or to down his/her level of the study. Vice versa, if the level examine submits with an excellent mark, then it is invited to up the level of the education or proposed to continue on this level of education. Creation of the educational process in this way saves the recipient's time, gives the best quality of acquiring the materials of the science and to the development of professional skills. The algorithm of this stage is shown in the picture 1.

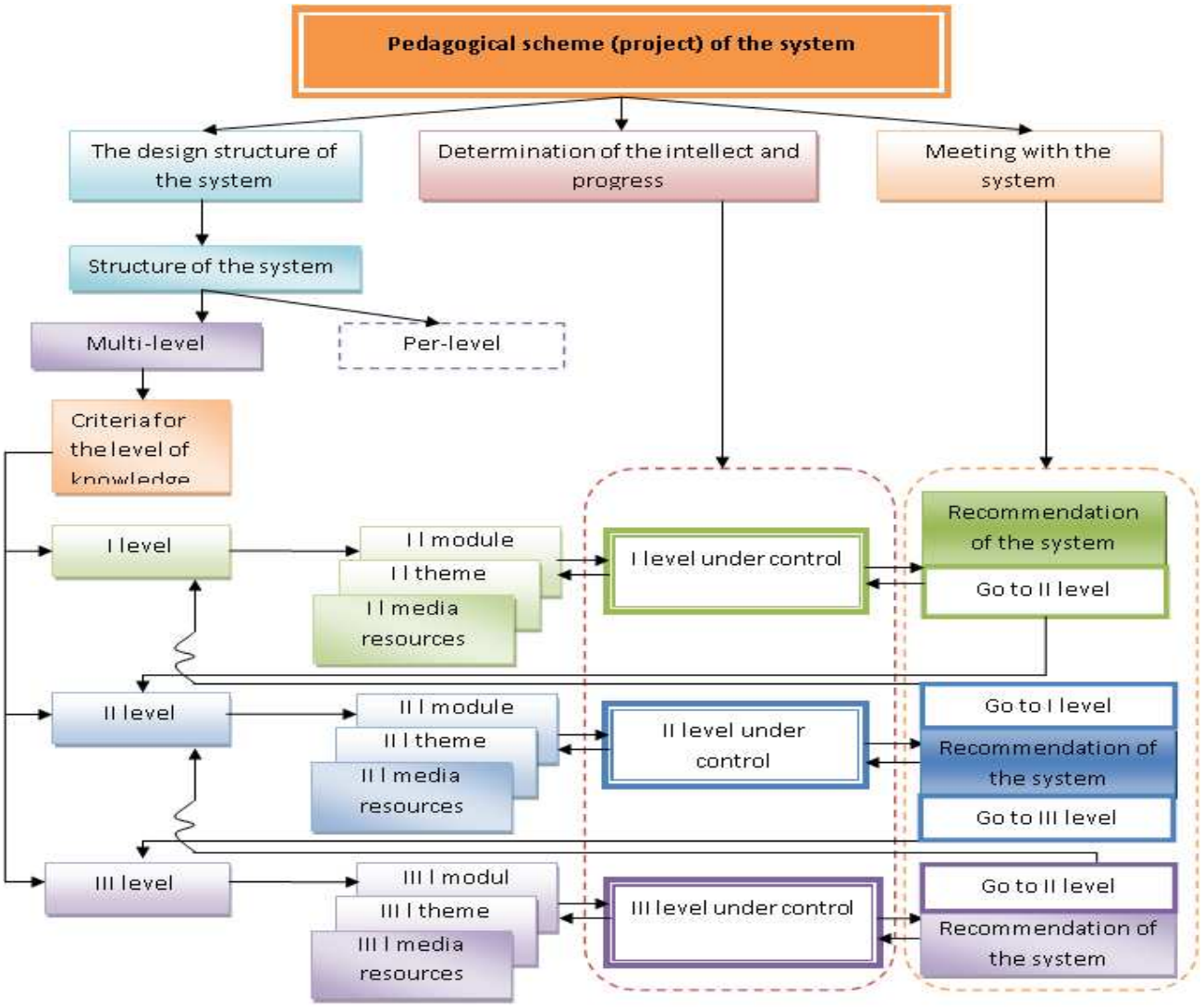

Fig 1. Pedagogical scheme (project) of the system

Multi-leveled education modules helps to choose the level of education and develop the skills and by increasing the difficulties of educational materials through, training and skills development.

The psychological significance of learning the level of the Intelligence tests is characterized by the ability of congenital and acquired characters to define the direction of the development a of child from the early childhood time. But, the results of intelligence tests are may depend on person's condition at the time his/her testing. Any person can improve the level of education and intelligence by working on himself/herself. Therefore, it would be wrong to consider the results of intelligence tests as permanent results, easily to separate child to "talented" or "untalented", because it is a complex process, which will continue for a long time. Therefore, the level of education of the participant can be changed in the continuous process of research and reading.

VI. CONCLUSION

Such a flexible system of education in the educational process takes into account the individual characteristics of the recipient, and then increase the level of the educational process as well as his/her intelligence quality. In order to create such kind of adaptive web systems to the educational process it is used Web technology and in order to control and to manage the data storage of the system it is used data base management systems. On creating such kind of web system for educational organizations it is useful to apply PHP technology and the best integrated database management system MySQL systems can be used.

In conclusion, we can say that web systems which are adapted to the educational process and which are fully matched to the individual characteristics of the recipient, accelerate the learning process, help to acquire the given materials and reduce the expenditures.

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