



STAGES OF ASSESSING STUDENTS' KNOWLEDGE WITH THE HELP OF INTELLIGENT SYSTEMS

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Article history:	Abstract:
Received: December 11 th 2022 Accepted: January 11 th 2023 Published: February 20 th 2023	This article discusses the specifics of using intelligent systems in the educational process, as well as discusses in detail the possibilities of automating assessment based on intelligent systems, which is one of the main types of educational process.
Keywords: intelligent systems, diagnostic evaluation, formative, summative, individual education, e-learning, intelligence.	

INTRODUCTION

The modernization of education is considered one of the priorities as one of the key indicators of changes in the world. In the process of developing technologies, informatization of education, the creation of effective methods for teaching student modern methods has become an urgent issue today. The use of non-traditional methods of teaching students based on modern approaches to the traditional form of education, the introduction of advanced technologies in the educational process encourages teachers to work more on themselves, and professional competencies are being formed. In this regard, it should be noted that one of the most effective ways to organize students' classes is to use an electronic educational environment based on modern technologies.

Many developed countries, such as the USA, Canada, China, France, Japan, Germany, not only train students in the field of education through the use of intelligent systems in e-learning, but also use modern technologies. It can be seen that it plays an important role in shaping the integration of information and communication technologies in education, helps to increase students' horizon, thinking, perception of existence through modern technologies, and also quickly and effectively overcomes obstacles to gaining knowledge in this area.

Intelligent systems are one of the most developing areas today. Because with the help of modern information and communication technologies, automated control systems are used in all industries, in transport management systems, in education, medicine and in all sectors of the economy. These systems are designed to perform intelligent tasks in these areas. Examples include smart streets in developed countries, self-driving cars, and products built using robots. This suggests that intelligent systems are widely used.

MATERIAL AND METHODS

The country has developed a regulatory framework for the introduction of Internet technologies in education, the management of educational institutions based on information and communication technologies. Decree of the President of the Republic of Uzbekistan dated September 18, 2019 No. PD-8050 "On approval of the Concept of a unified information policy of the Republic of Uzbekistan" made it possible to accelerate the information policy in the country [1]. Also, in the Decree of the President of the Republic of Uzbekistan dated February 17, 2021 "On measures to create conditions for the accelerated introduction of artificial intelligence technologies" PD-4996, in accordance with the strategy "Digital Uzbekistan - 2030", priorities were identified for the rapid introduction of artificial intelligence technologies and their widespread use in the country, ensuring access to digital data and their high quality, creating favorable conditions for the training of qualified personnel in this area [2]. These decisions will provide a legal basis for the implementation of reforms in the field of education and the use of intelligent systems in education.

Many scientists have conducted research on the use of intelligent systems in the educational process and its effectiveness. As a result of the study, the advantages, disadvantages and achievements of reading and learning based on intelligent systems have been studied in detail. Among the scientists who conducted research in this area were G.G. Isaeva, N.P. Stroykin, A.V. Shapaval, E.V. Smirnov, I.E. V.Yamshanov.

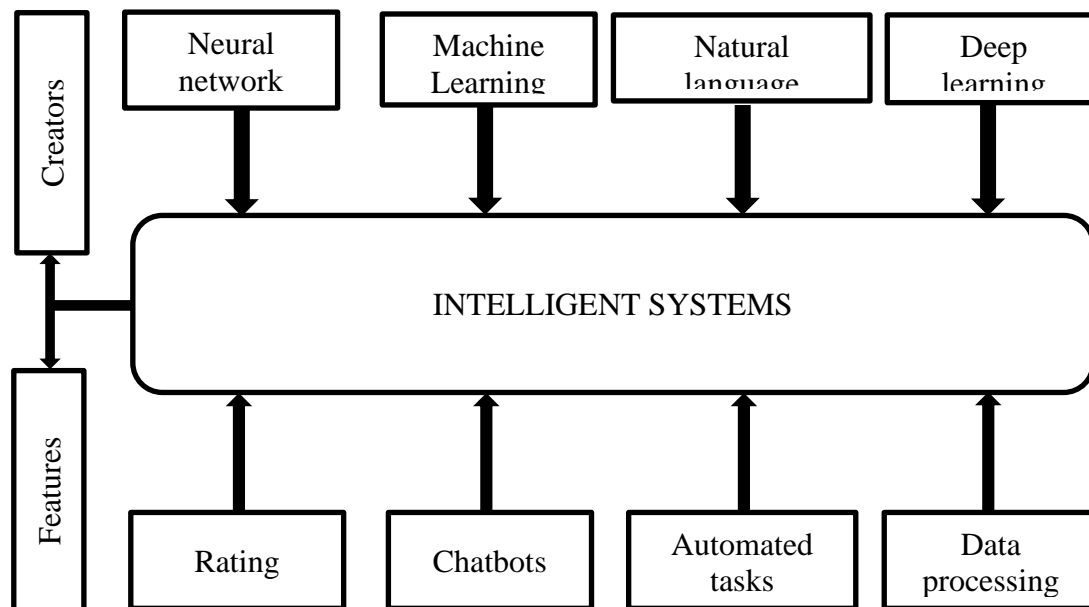
RESULTS

Intelligent systems are a set of methods and means of organizing, accumulating and applying knowledge to solve complex problems in a specific subject area [3]. An intelligent system based on the highly qualified experience of a team of experts achieves higher efficiency in choosing solutions due to the redundancy of a large number of

alternatives, evaluation and analysis of the influence of a large number of new factors when building a strategy. The basis of intelligent systems is a body of knowledge (knowledge base), structured in such a way as to form the decision-making process.

The Intelligent Systems Environment is the intelligent system of a team that interacts with each other according to the unique rules of the Intelligent Systems. For example, marketplace, e-commerce, internet, e-learning and more.

Intelligent systems are tools that allow computers to learn from experience, adapt to new information, and perform human-like tasks [4]. These intelligent systems consist of several technologies, and as a result of these technologies, specific features of intelligent systems are formed. We can see this in scheme 1.



Scheme 1. Creators of intelligent systems and their features.

An important aspect of intelligent systems in the learning process is that they automate assessment. Assessment is the process of evaluating students' knowledge for completed tasks. There is a great need to assess the knowledge of everyone, from high school students to students. Evaluation helps students understand the quality of the assigned work. The traditional evaluation process involves reviewing and evaluating each assignment. The quality of the assignments completed and the validity of the main topic of the assignment are important factors for evaluation. Intelligent systems can automate one of the key types of learning, such as assessment. Experiences in educational institutions show that homework, lectures, practical and laboratory work, tests can be tiring. Even in the elementary grades, frequent assessment of students by teachers takes a lot of time to communicate with students, prepare for the lesson or improve professional skills. Education using intelligent systems automates almost all types of assessment and control for teachers.

To date, diagnostic, formative and summative forms of assessment are among the most widely used in the educational process. Each type of assessment is used in a specific part of the learning process [5]. For example, diagnostic assessment (initial control) is a type used to determine students' knowledge potential before teaching science, the degree of scientific concept formation and their interest in science. This type of assessment is mainly used by the teacher to determine what students need to know and what knowledge they need to acquire before starting classes. In this way, the teacher helps students fill in the gaps in their knowledge by giving them new ideas on the topic.

Formative assessment is used to assess students' knowledge in the classroom. This, in turn, ensures the active participation of students in the learning process. This assessment helps determine how well the student is learning about the topic in class.

Summative assessment is a general type of final assessment based on the value of the knowledge gained by the student at the end of the course. That is, it answers the question of what the student knew before and what he has learned now. This is a form of assessment that is usually used at the end of a class or course.

DISCUSSION

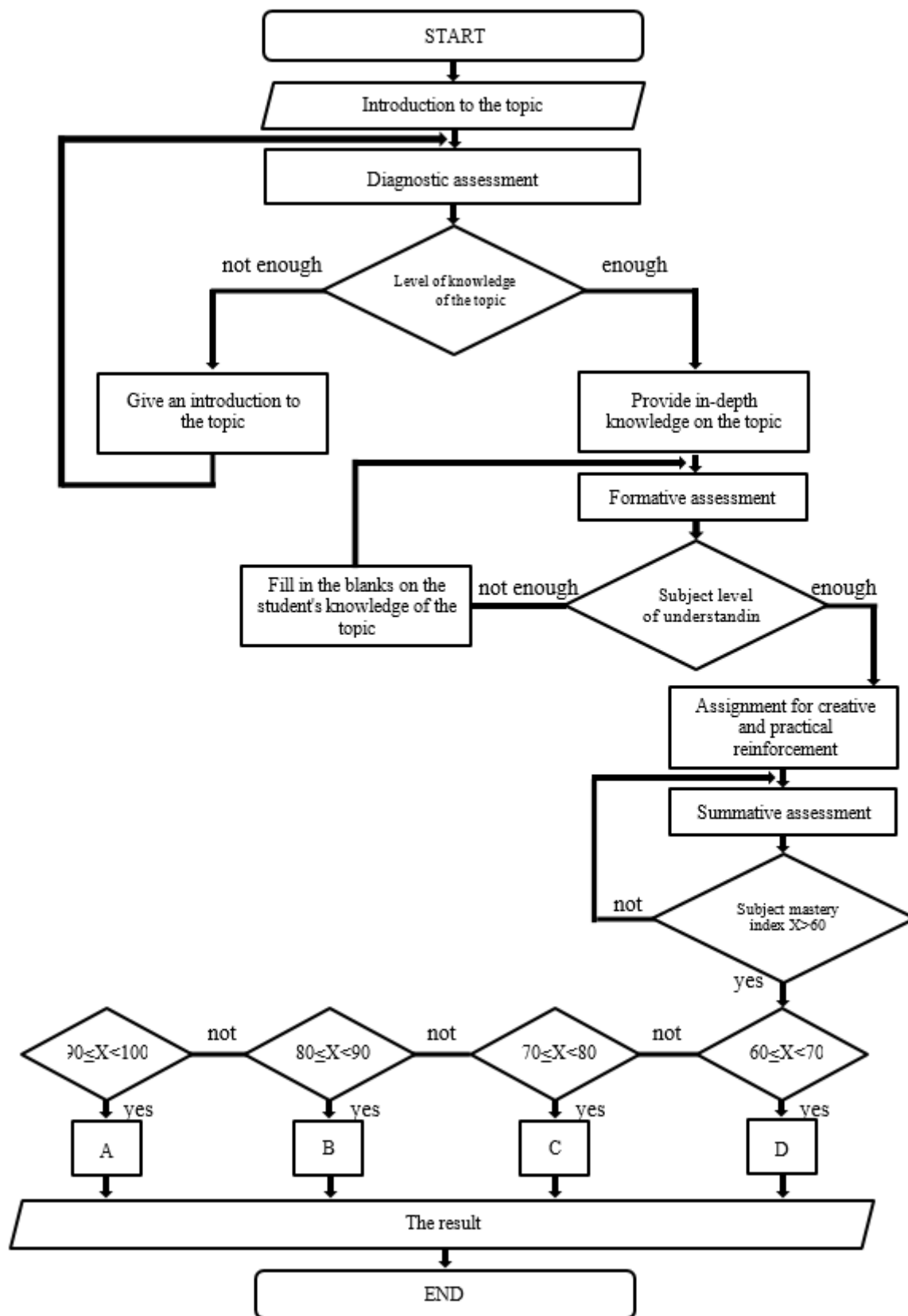
The advantage of learning based on intelligent systems is that the student answers a series of pre-test questions on the topic to be covered in the electronic educational environment. Thanks to this, intelligent systems determine the knowledge of students through a kind of diagnostic assessment. It also gives the student his recommendations, that is, determines the level of knowledge of the student and automatically gives him his recommendations, individually identifying gaps in his knowledge. An important aspect of this is that intelligent systems provide each student with the knowledge they need to acquire on an individual basis. This means that, unlike the traditional form of education, not

only topics that are common to all are covered, but also classes are organized based on the level of knowledge of the student.

Once the student's knowledge on a topic is determined, the intelligent systems recommend the student the knowledge he needs to master on that topic. Assignments are given throughout the course to determine how well the student masters a new topic. In this case, intelligent systems help to collect information about students' knowledge and evaluate them in a formative way. This assessment allows the student to control himself in mastering the topic. Advises lagging students to relearn in an easier way. As a result, the student can move on to the next topic after gaining knowledge of each topic. This prevents the student from moving on to the next topic without mastering it.

At the end of the course, students can use the overall final assessment, i.e. summative assessment, in learning based on intelligent systems. Assessment based on such intelligent systems can not only test students' knowledge, but also make recommendations on students' knowledge. That is, depending on whether the student has mastered the subject, he is given additional knowledge and information about what he has studied. As a result, the student will be able to determine the level of knowledge, skills and abilities in science with such information. Summative assessment of students' knowledge based on intelligent systems allows them to achieve time savings, as well as subjective assessment without any bias, as well as the possibility of making recommendations on the student's knowledge. There are several stages of assessing the cognitive potential of students with the help of intelligent systems. We can see this in scheme 2.

In this picture, the student first undergoes a diagnostic assessment using various types of tests on the topic being studied. That is, the basic knowledge of the student in the subject is checked. If you pass this stage, you will be given new knowledge and skills based on the level of knowledge of the student. If the position is not passed, the basic knowledge is explained to him, his knowledge is checked again and he proceeds to the next stage. At the next stage, the student is given theoretical and practical knowledge on the subject. In the meantime, the student passes the formative assessment, with a positive result, he moves on to the next stage, otherwise the student is given a choice, either agreeing to a lower grade, or further strengthening his knowledge and testing his knowledge of the subject. In order to increase the effectiveness of the knowledge of students who have passed this stage, additional information will be added to it, and eventually the student will reach the stage of summative assessment. At this stage, knowledge on the topic is consolidated and a final test is conducted to determine the level of proficiency in the topic. If the test is positive, the student will receive a high grade, but if he/she does not do well on the test, he/she will be given another choice. That is, the student is given the opportunity to double-check his knowledge by repeating topics in order to consolidate knowledge, regardless of whether he agrees to the average mark or not. If we organize classes according to the scheme above in an e-learning environment, we will be able to approach the student individually. There will also be an opportunity to provide the student with the necessary theoretical and practical knowledge, depending on his or her educational potential. The letters A, B, C, D in Scheme 2 are an assessment of this credit-module system. X is the student's score.



Scheme 2. Stages of assessing students' knowledge using intelligent systems.

CONCLUSION

Intelligent systems can change where students study, who teaches them and how they learn basic skills. While there are likely to be big changes in the next few years, the reality is that intelligent systems could radically change everything we know. With the help of intelligent systems, software support, students can study from anywhere in the world at any time, and such programs can replace certain types of reading in the classroom. Automation of intelligent systems, which is such a type of educational activity as assessment in education, also opens up opportunities for individual learning. In addition, assessment based on such intellectual systems fills in gaps in students' knowledge, creating a basis for learning based on their interests and cognitive potential.

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