# THE ELECTRONIC TEST IN CONTINUOUS MEDICAL EDUCATION

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## ABSTRACT

The continuous education is necessary for every practicing doctor in all levels of a health care system. Test and certification systems are an appropriate form lending doctors in continuous education. Technical training facilities are based on technical progress of education. The tests are the main tools in all forms of formal and informal education . The electronic test allows management of the learning process with precisely defined objectives that leads to operational activities.

**Key Words:** Test systems, continuing medical education.

## INTRODUCTION

The new information technologies allow the time and place of education to be determined by the student, which gives a different aspect of the training process and makes the student from a passive observer to an active participant in the process. It allows the students themselves definitions timing, extent and the rate of absorption of the material. On the other hand On-line based training systems allow faster results at lower costs, increased access to training materials and clear idea of the all participants in the learning process(Velikov, Zlatanova-Velikova,& Petkov 2012).

Conducting continuing medical education is an important element in the implementation of national health policy and aims to increase and maintain the qualification of medical professionals performing diagnosis, treatment and rehabilitation in medical institutions. Training of health professionals is essential for ensuring the required quality of medical services and improving their efficiency.

The main conclusion that can be done from a survey conducted among GPs is that most of the doctors do not have enough free time for training. This imposes a larger organization and prior coordination of the time and place of GPs to ensure more active participation in training process. The problem with the place and timing of continuing medical education can be solved using the test systems and dialog programs for the implementation of programmed education.

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## TEST SYSTEMS

By Velikov (2011) the using of information technology for the purpose of continuous education has the following impact on the learning process:

- The application of information technology in the learning process saves time and effort in training;
- Web - based learning allows students to take an active part in their learning, improve their skills, without limitations on the distance and time;
- More useful information than traditional learning classical auditorium sessions can be achieved. Improves access to training materials and vision to all participants in the learning process;
- E-learning education offers accountability (feedback), personalized and collaborative learning and accessibility.

Generally the using of test materials has the following advantages:

- A more objective evaluation of results;
- E-test system cannot be manipulated, as each student provides various issues;
- Increasing the level of knowledge of students;
- Do not assume the student with time and place;
- Allows the student individually to plan and manage the learning process according to the rate of absorption of the material;
- Increasing the efficiency of the examination process;

The main weaknesses include:

- Long process of building the system - includes technical implementation of the system and constructing of a system of questions and correcting information;
- Extra technical support:
- Long-term maintenance and improvement of the system - expressed in a continual update of questions and the correcting information in the system;

## CONTENT STRUCTURING

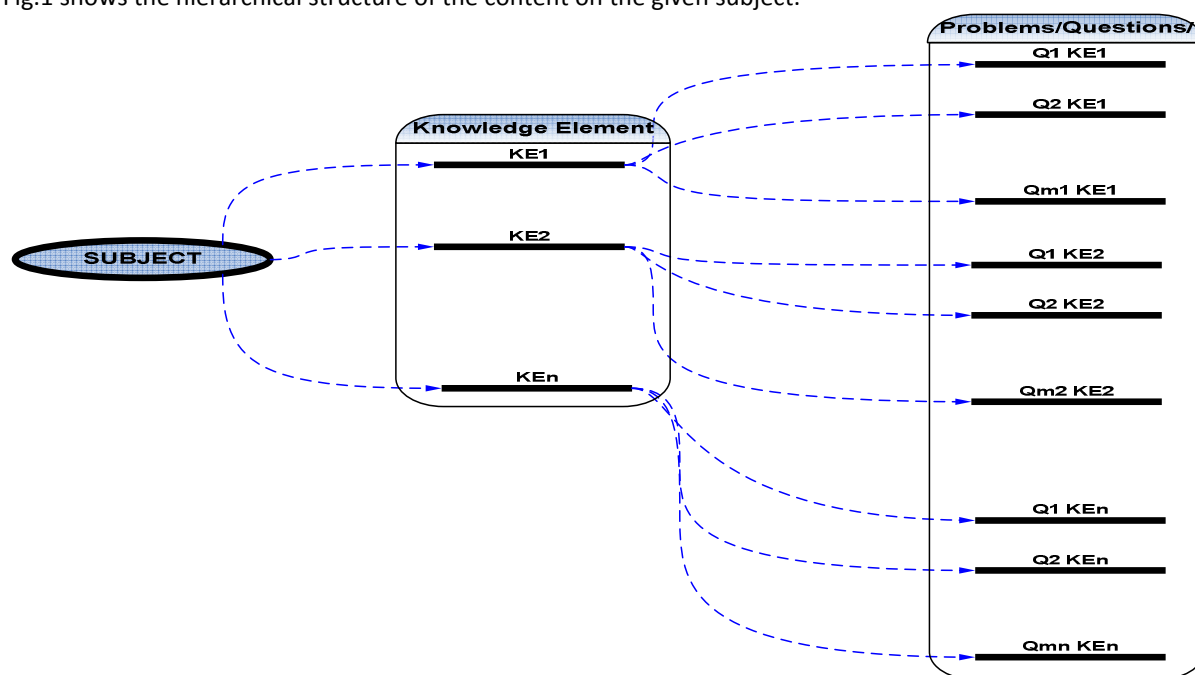Fig.1 shows the hierarchical structure of the content on the given subject.



Fig.1: Hierarchical structure of the content on the subject

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Questions $Q_i$ in saved in assessment system about the subject are grouped as a system of knowledge elements $KE_j$ over six levels by Bloom's taxonomy /perception, comprehension, application, analysis, synthesis, evaluation/. This allows the construction of the test based on whole subject where the questions are from different knowledge elements and test based on given knowledge element where the problems are from different levels of Blum's taxonomy. This guarantees the more precise assessment of the degree of absorption of the material by the students.

## EDUCATION PROCESS

Fig.2 shows the process of education. After every knowledge elemen the student solve test covered that knowledge(Velikov et al,. 2012). Acording to the result of the assesment there are two directions:

- Not pass – the students have not passed the test and additional education is needed. The system suggest correcting knowledge according to made mistakes in test;
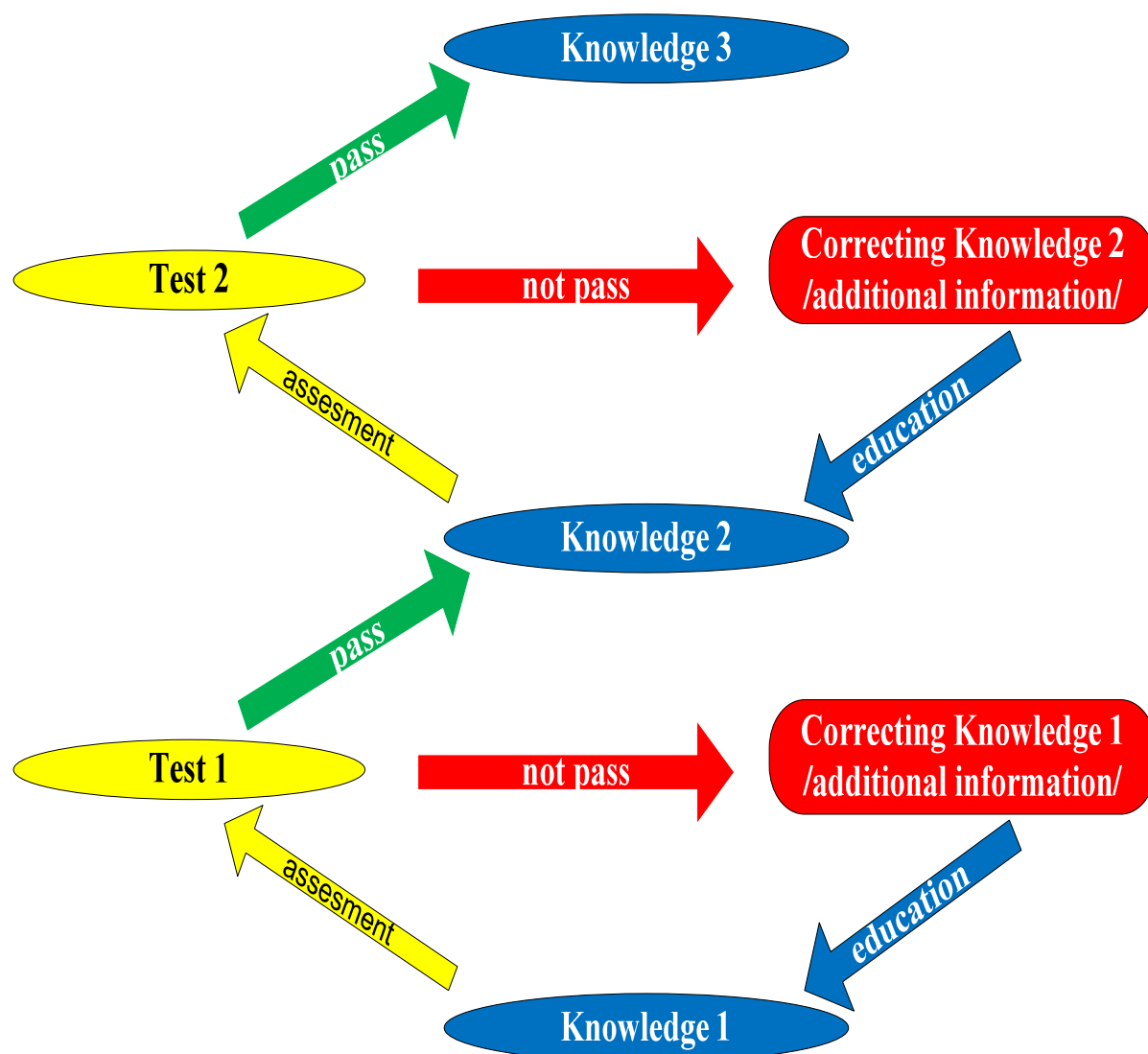- Pass – the students have passed the test and were redirect to next knowledge.



Fig.2 : Diagram of educational process

**IMPLEMENTATION OF BASIC FUNCTIONS**
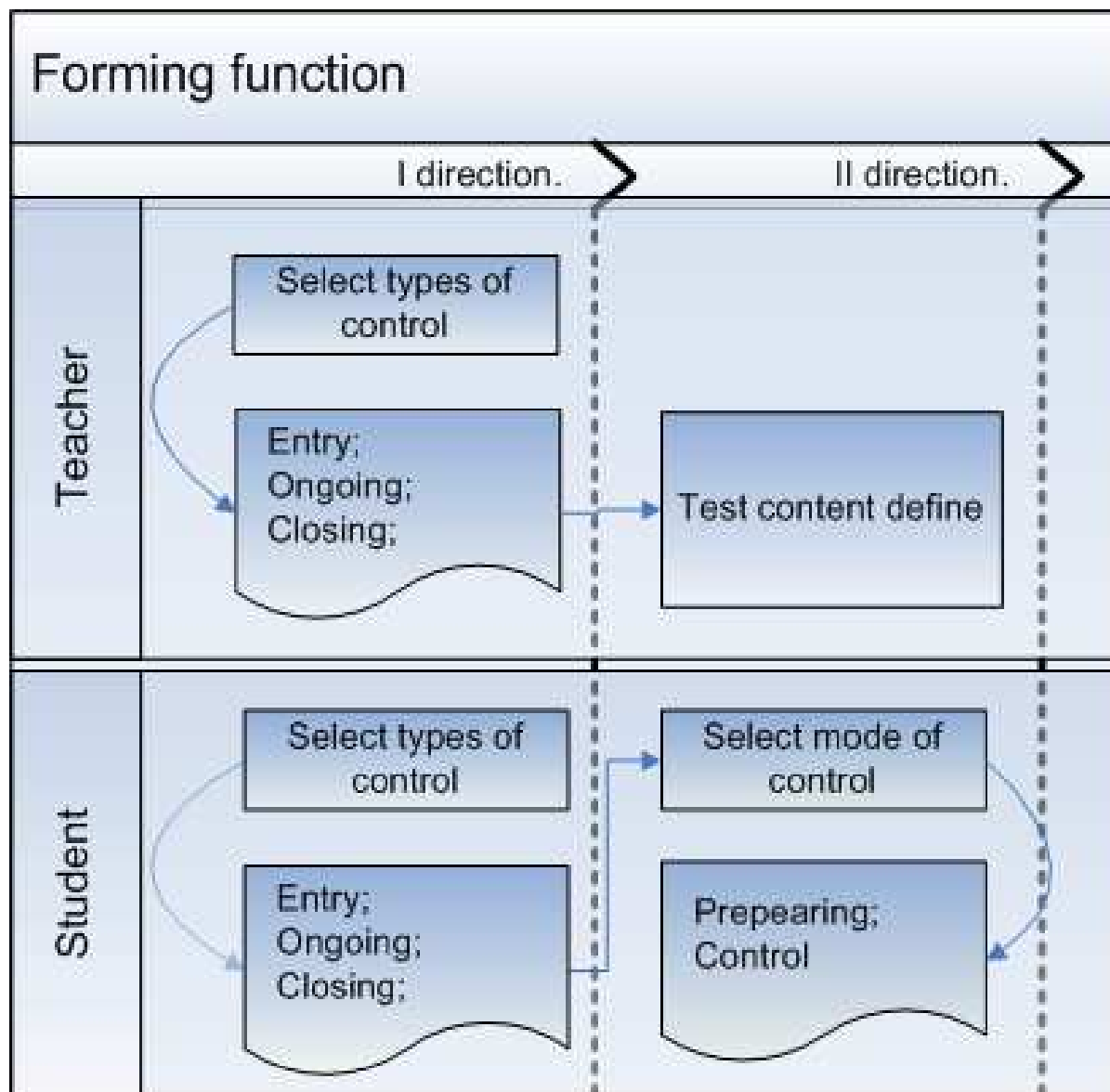
**Forming function**



Fig.3: Forming function of test systems

Presents the opportunity to direct and manage the learning process. This function is realized by both the teacher and the student. The presented structure of the learning content allows the implementation of this function in two ways[Zlatanova-Velikova 2011]:

**A. I direction**
It is related to the type of control that can be implemented using electronic tests. Can offer following types of control:
• Entry control - determining knowledge of the learner before education in certain subjects;
• Ongoing control - control during training, it may cover one or more cognitive elements;
• Closing control - final examination on completion of education in certain subjects.

**B.    II direction**

- For the teachers is realized by control of the tests - for each one of the tests of I level electronic systems allow to determine the configuration of the test / number of questions from each of the cognitive elements /;

- For the students is realized by two modes of assessment - prepearing - for each of the questions in the system and provide more information. In this mode, the student can check their knowledge and corrected after each question and control - mode real test.

**Diagnostic function**

The diagnostic function is aimed at detecting problematic knowledge elements *KE,* to correct contents of the system and the created tests. While the students have access to their results, the teacher is able to check results for every solved the defined test and to analyze the results of all group. This feature is the result of a continuous process of interaction between student and teacher with the help of the test system that can be described with the following actions (Zlatanova-Velikova & Velikov 2011):

A.    Student - The role of the student is expressed mainly in solving tests. He chooses the test and answer the questions. This activitie occurs in parallel with the actions of the teacher. Also, the student can review the results and to correct their knowledge before the next test session;

B.    Teacher - The role of the teacher is to identify educational problems by analyzing the accumulated data for solved tests. The reactions of the teacher are:

- Problem definition - Identification of KE where students permit as many errors and problems;

- Adapt the database content- Preparation of the corrective information for detected typical mistakes and including the new alleged wrong answers in the system, changing the contents of the test by altering the number questions covered define KE, included in the test, and changing the questions in the system / add new, delete old, correction of existing .
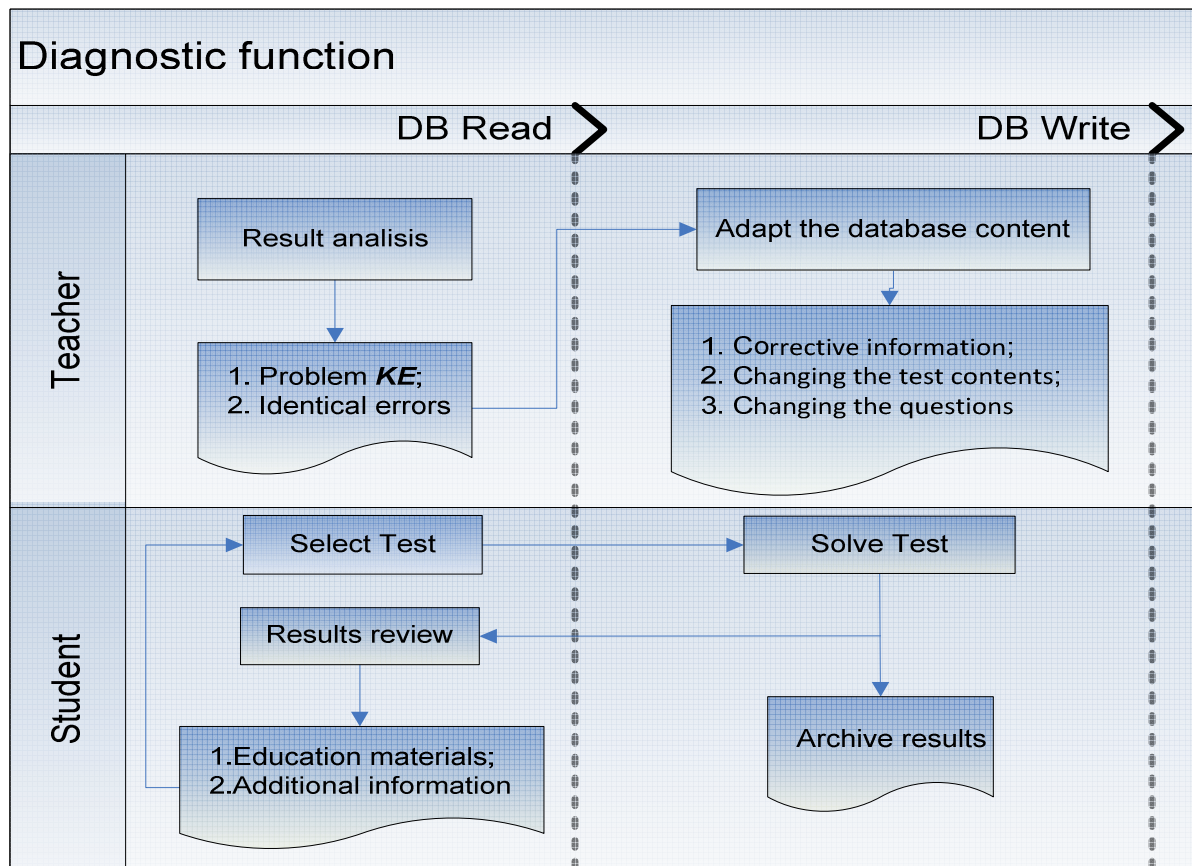


Fig.4:  Diagnostic function of test systems

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## CONCLUSION

We can draw the following conclusions:
- The using of tests in a virtual environment encourage independent work of students;
- A student opportunity to ask questions ;
- The results from the tests are used for self-organization and self-control by the student.

Internet is a source of information, but in many cases it is unregulated and methodically incomplete or inaccurate. Offering on-line test systems become global network not only a source of knowledge but also a corrective to the already accumulated knowledge and skills. In this sense WEB - based test systems have a future in education. Whether the use of test systems will be included in the continuous medical education is a matter of will on the part of primary health organizations. But as a tool for determining degree of absorption of the knowledge of the trainees and an essential tool for certification, they should find a place in the implementation of continuing medical education.

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