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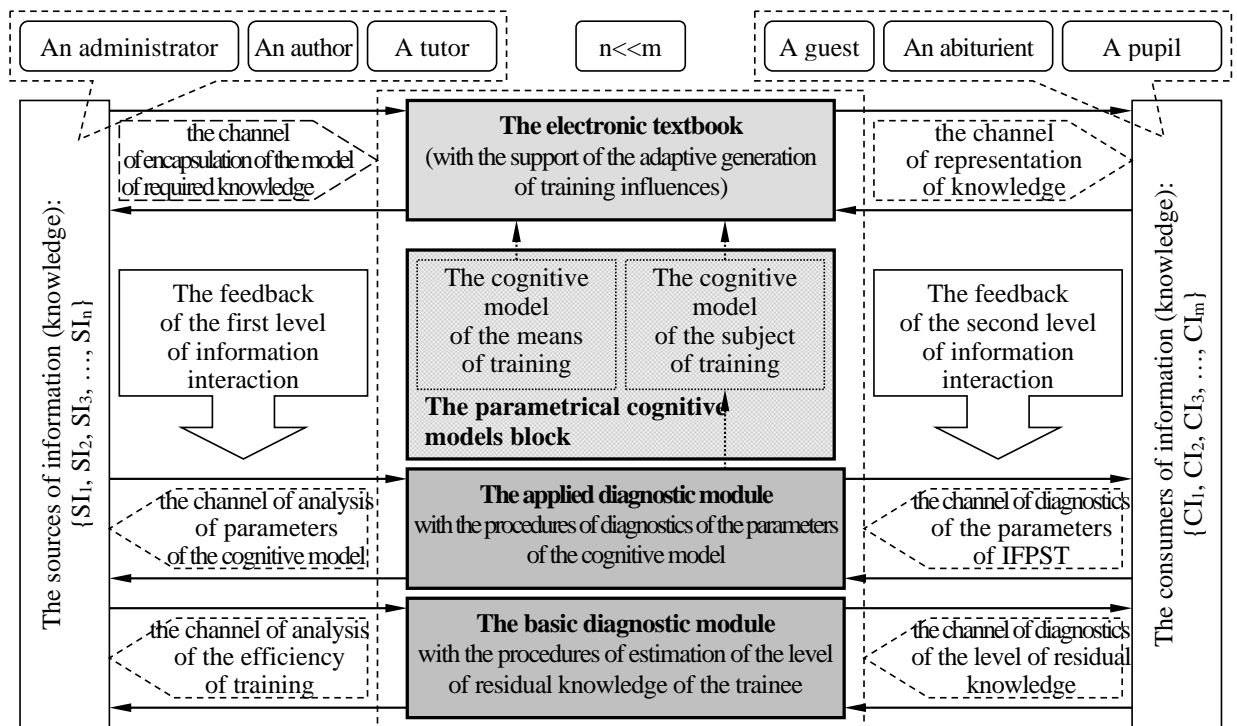
THE ANALYSIS OF THE INFORMATION ENVIRONMENT OF THE AUTOMATED
TRAINING WITH THE PROPERTIES OF ADAPTATION
BASED ON THE COGNITIVE MODELS

The high rates of scientific-technical progress and the modern level of development of the information technologies in the sphere of education causes the possibility of realization of the adaptive means of training of a new generation in the basis of automated information-educational environments (IEE), allowing to generate the educational influences taking into account the individual features of trainees (physiological, psychological, linguistic and others).

The specifics of information interaction between the subjects and means of individually-oriented training in the automated (virtual) educational environment initiates the consideration of a row of applied scientific areas: physiology of perception (Baru A.V., Izmailov Ch.A., Krol V.M., Smirnov V.M. and others), cognitive psychology (Arshinov V.I., Druzhinin V.N., Zinchenko T.P., Kholodnaya M.A. and others) and linguistics (Geek M.L., Kobrina N.A., Potapova R.K. and others).

The proposed approach is directed on the solving of the complex scientific task of creating, analyzing and improving of the efficiency of functioning of IEE of the automated (remote) training (ART) system with the properties of adaptation based on the parametrical cognitive models (CM) block, suggests: firstly – the making of changes into the organization and technology of the process of automated training, and also the modification of the principles of functioning of the main components of IEE (the electronic textbook, the diagnostic module and others); secondly – the creation of the cognitive modeling technology (CMT), including the technique of its use and the algorithm of formation of CM based on two ways of representation (graph and scheme); thirdly – the formation of CM of the subject of training and CM of the means of training; fourthly – the development of the technique of research of the parameters of CM, the algorithm of processing of a posteriori results of testing and the complex of programs for the automation of the tasks of research.

The general structure of ART system with the elements of adaptation based on the parametrical cognitive models block (pic. 1) is a closed loop, including two levels of information interaction and several channels of information exchange between two categories of subjects of the educational process.



Pic. 1. The automated (remote) training system

with the properties of adaptation based on the cognitive models

The modified structure of IEE and the principles of functioning of the components of ART system allow to realize the additional contour of adaptation based on the parametrical CM block, providing the increasing of efficiency of the formation of knowledge due to taking into account the individual features of trainee and the technical capabilities of the means of training at the generation of training influences.

CMT acts as the universal in relation to the object of research and contains the cyclic sequence of stages: the identification (the collection of primary requirements, limitations or the modification of the initial tasks of research), the conceptualization (the conceptual scheme of the object of research or the modification of a set of concepts), the structuring (the structural scheme of the object of research or its modification), the formalization (the selection or changing of the way of representation of CM), the structural analysis (the verification of the first level of the structure of CM), the parametrical analysis (the verification of the second level of the structure of CM), the realization (the placement of CM in the environment), the modeling based on the holistic approach (the revealing of the problems of measurement and accounting of the parameters of CM), the analysis (the statistical processing of a posteriori data, the revealing of regularities and factors, causing the difficulties of the trainee, and also affecting on the increasing of efficiency of the training), the subject interpretation (the scientific justification of the obtained results), the synthesis (the accumulation of new knowledge about the dynamics of functioning of the object of research).

CM acts as the modifiable (in width and depth) repertoire of parameters, echeloned on a set of portraits and stratified on a row of sets (the first level: the set of kinds of properties, the set of properties; the second level: the set of vectors of parameters, the set of parameters), reflecting the features of the object, process or phenomenon of research.

The representation of CM is possible by the various formal and nonformal ways (the graph and the structural scheme are proposed).

The parametrical CM block in IEE of ART contains CM of the subject of training and CM of the means of training (presented in the journal "Proceedings of "IHEAS"", №3, 2006 y.), which accumulate respectively the parameters, characterizing the individual features of perception (the physiological portrait), processing (the psychological portrait) and understanding (the linguistic portrait) of the information fragments by the trainee and the parameters, reflecting the potentially possible kinds, types and ways of generation of the educational influences.

The technique of research of parameters of CM provides the setting of experiment and the carrying out of automated diagnostics of the parameters of CM by means of use of the applied diagnostic module.

The algorithm of processing of a posteriori results of testing allows to form the interval scale and the function of estimation, to carry out testing on their basis, to estimate the condition of the trainee and the quality of test.

For the automation of the tasks of research of IEE of ART system with the properties of adaptation based on the parametrical CM block the complex of programs has been developed, including: the adaptive means of training (the electronic textbook) – provides the individually-oriented generation of educational influences based on the innovative parametrical CM block, the basic diagnostical module – realizes the automated estimation of the level of residual knowledge of the trainee in the studied disciplines and the applied diagnostical module – allows to automate the research of the parameters of CM.

In the basis of the electronic textbook the adaptive representation of information fragments processor is located, providing the individually-oriented generation of educational influences based on the parameters of CM of the subject of training and CM of the means of training.