THE CHALLENGES OF IMPLEMENTING NEW INFORMATICS TECHNOLOGIES IN THE EDUCATIONAL SYSTEM

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Abstract

The evolution to a society characterised by the introduction of the informatics and communication technologies determines the increasing of the intelectual work efficiency by using the artificial intelligence and the development of some training forms with an individualisation focusing. It is considered that in human activities intervene three fundamental elements: raw materials, energy and information; the last one plays a special role in the educational-instructional process. The main source of the future social-economical development is represented by the production and the consumption of information, so that the school will have to form superior level skills in the information manipulation. New informatics based technologies enhance the individual's capacities, developing his ability to reason in a logical and abstract world and in this way – to include a larger and deeper topic. All of these impose the rethinking of the entire new educational system. The education will have to be thought again in connection with the new technical possibilities – on one hand and- depending on the new society's requirements- on the other hand.

Keywords: NIT implementation, trainers' training, to be aware.

1. NIT – educational system restructuring relationship

"The technology is one of the key-factors of the educational system restoration" [The 9-th International Conference on Technology and Education - Paris, 1992 from S. Petrescu, 1994].

Lately we assist to a real explosion of the informatics system. It influences the whole society, imposing the education restructuring. This one suffers NIT influence due to the society informatisation and so, it participates, by feed-back, to the stressing of the economical and social development. The action of introducing the computer in school institutions was influenced by factors far from didactical world (economical exigences, industry interests, trade pressures, social pressures, cultural factors, political factors and technological ones). We can't say the same thing about the reasons for introducing the computers in education, which are closer by the educational field. Hawkridge (1990) classifies these reasons as follows:

- *social reasons*: pupils must be prepared to act in a proper way as citizens in a society influenced by NIT;

- *professional reasons* – even the need of some well prepared professionals is a social necesity, this reason is called "professional" in order

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to discriminate it clearly by the previous one;

- *pedagogical reasons* – the computers can enrich the institutional process and the learning results;

- *catalytic* reasons – the computers' use can accelerate another educational innovation, by which the informatoin processing and problems – and less the data memorisation are stressed in the teaching-learning process; this argument refers to the school possibilities of being changed by a better introduction of NIT.

According to Hawckridge, the virtual effects would be: the logistics improvement and the management efficiency; it rather stresses on pupils the learning by cooperation than that by competition.

- *the informational technology reason s*ubstantiates the idea of computers national industry stimulation by the governmental expenses in order to enhance the numbers of computers produced and assemblied at the national level;

- *the effective costs reason*: the computers can drastically reduce the national costs, as they will allow the reduce of the teachers number. This argument is available for the qualifications in bussiness, industry, but it isn't a real support in formal education;

- *the oportunist reason* distinguishes in the initial stage of computers introduction and it consists in the expectation as for computer use in school to attract more pupils in school. [W. Pelgrum şi T. Plomp, 1991]

It can't be about just one reason that leads the educational politics achievers. Most of the time, two or three of these reasons refer in the same time to the reference points of the politicians, at any level. On the other hand, selecting a reason as dominant can determine a great extension of the strategies implementation, as well as of the budgeting needs.

The planning elements for the NIT implementation in school (being aware of the problem, the involvement and the trainers' training).
Analysing the planning elements for the NIT implementation in schools e distinguish:

1. Being aware of the problem
2. The involvement
3. The education and trainers' training

2. Being aware of the problem

A. A first factor which must be established in this stage is the real situation in the moment of NET introduction (new educational technologies). In order to do this is firstly imposed a review of the previous moments:

1950 – the first programmes for IAC showed up in USA; the first softs were based on the programmed instruction method. The computer is used as a support of the didactics programme.

1960 – the occurence of programmed instruction technology; the first

attempt of involving of the computers as a "learning machine". The sixties were touched by "programmed instruction" prevailing. The achieving of the planning followed the route: textbooks – simple devices (of facilitating the text manipulation) – mechanical instruction machines – more and more complex electronic instruction machines – electronic machines;

1963 – an international body (The International Federation for Information Processing) creates a technical commitee for problems in education field;

1967 – in the frame of ACM (Association for Computing Machinery) is set a commitee for the computer assisted instruction.

The definitory elements of this first period are:

1) IAC knows different approaches: on one hand, as a development of the programmed instruction and on the other hand, as an application of the techniques promoted by the artificial intelligence.

2) numerous investigations are organised in order to elucidate of the problems raised up by the learning mechanisms under the circumstances of an interactive programme (IAC impact on the learning psychology)

3) a new vision on the "content" analysis and organisation is designed: the stochastic patterns, languages of knowledge description, automatical documentary, interaction language.

1970 – the organising of some experiments, modifications in the curricula; in Canada starts the implementation of LOGO project;

- CERI (Le centre pour l'education, la recherche et l'innovation) organises in France a world congress devoted to the informatic in secondary education;

- the organising of "*Computer for education*" world conference in Amsterdam

1976 - LOGO project is extended in the special education

1977 – in France, the start of the experimentings of LOGO project implementation as a learning tool in the de implementare a proiectului LOGO Montpellier school. This period is the one of the reconsiderations, of the broadening of the investigations and applications area: the use of the mathematics patterns, IAC systems, problem-solving, dialogue system, simulation, learning by playing.

It has been noticed a significant positive impact on the students' progress in mathematics and mother tongue, but it has been observed in the same time that the good students are favoured to the prejudice of the weak ones, as the syllabus which allow students to progress in their own rythm create the risk of losing students on the way, of those who can't control themselves the learning approach.

The main achievements of this stage are:

- the didactic strategy modification, meaning passing from the programmes integrally found under the computer control to the programmes which allow the pupil's initiative;

- innovations at the hard level, by creating some terminals which allow to

a great number of users to benefit the services of a central computer;

- the achieving of some experimental surveys on big samples, concerning the way of using the computer as an instruction background.

1981 – the achievement of an operational system on microcomputers.

Starting with the eighties occur the relatively cheap personal computer and with broaden possibilities of achieving the dialogue, fact that led to a development in many directions of IAC. It is manifested the tendency of the passing from a rigid didactic strategy, with short possibilities of individualisation, to one which considers the pupil as an individuality, who thinks, understands and has initiative. Beside the text editors, the counting tables, the generetors for data basis, there are educational softs for teaching some disciplines and for different levels of instruction. Some of them propose to present the important information or to mould the phenomena, others – to produce learning by a special system of practicing; finally, there aren't few which propose to evaluate the level of reaching some goals of instruction.

The conclusions which can be drawn for these moments, some of them characterizing the current stage, could be:

- the mediocre results; the small number of the research projects concerning the informatics' influence in education; the decisions concerning the introduction of computers in education didn't have decisions based on research as a basis; the creativity's absence at the applications level; difficulties connected to the material basis.

The recommendations and suggestions imposed stress

- the prioritary role of research (there are imposed studies concerning: comparing international situation; the relation between the informatics politics and its use in education; the critical analysis of the actual, pragmatic trends; the strategy of the private and public sector association, the quantity and the quality of the material; the teachers' training);

- costs-efficiency relation;

- the role of informatics alphabetisation;

- surveys on te education's content (major problems: the effect of the computers introduction in social and economical; the influence of informatonal technology on the relative importance of the diverse intelectual faculties; cultural differences)

- the implications of NTI use;

- the interanational cooperation [Stanford Conference, 1986]

B. Another factor that must be remnded in *problem awareness* stage is the establishment to all levels (departmental ones) of what the technology can do for he users and to th tasks that this one will get as a consequence of the informatics integration in school. In order to introduce and use the informatics and communication technologies (ICT) to all educational levels the vital role of the well trained teachers must be stressed. That's why it s desired an harmonious interaction between hard, soft and staf instruction

(*Hard and soft*). The education is a less efficient market than the traditional markets – industry and services. Quite inside education we can discriminate advantageous sectors – higher education, the technical one – and less advantageous ones – 1-st and 2-nd cycles. It can be said that the informatics industry adopts a behaviour specific to the market economy towards this problem: the recognizing of the advantageous areas and the achieving of some standardised products).

- the use of ICT will infuence the projection of the educational politics, curriculum and teachers' training programmes;

- educational soft development will be achieved in a tight cooperation between the educators and the soft designers;

- the need for the data basis for the introduction and the implementation of the informatics in the educational systems was stressed with a special concern to the teachers training programmes planning;

- the need of evaluation;

- it has been stressed the idea of cultural identity protection concerning the soft development and distribution;

- the cooperation refering the soft and hard development between countries, especially the ones that own remarkable cultures, high education standards, experience and critic spirit;

- the necesity of a rapid and easy access of the educators to data basis, eventually in cooperation with UNESCO;

- the investigation of the development possibilities of some digitised images basis on a CD;

- the designing of a data basis on the ICT use in education (disciplines, networks, educational soft, training programmes, lists of experts);

- the development of the training programmes, methodologies and other materials for the introduction of ICT in the secondary education by the cooperation of more European countries;

- the development of a pilot project on the introduction of ICT in the secondary education on two years;

 - a study on the ICT introduction management in education, including technical, financial and resources use issues (hard, soft, networks, audio-video equipments);

- the protection and the keeping ofthe languages and cultures in the ICT standardisation context;

- cooperation projects connected with hard, soft and training;

- the achievement of a research project having as a goal the definition of a mathematics model of learning and teaching for the improvement of ICT use in education.

The evolution towards a society characterised by the informatics and communicational technologies insight determines the enhancing of intelectual work efficiency by using the artificial intelligence, the development of some instructional forms – with a stress of individualising –

the practical transposition of the permanent education.

The new technologies based on the informatics increase the individual capacities, developing his ability of reasoning in the frame of a logic and abstract world and so, of comprising a larger and deeper issue. The unique qualities of the computers are represented by the computer interactivity, the precision of the achieved operations, the ability of offering multiple and dynamic representations of the phenomena and, especially the fact that it can consistently and diversely reacts with each pupil; it encourages the active construction of knowledge, it assures the significant contexts for learning, it promotes the reflection, sets the pupil free of many routine activities and it stimulate the itelectual activity. All of these will impose a whole rethinking of the new educational system. The education must be rethought on one hand-according to the new technical possibilities and- on the other hand-depending on the requests of the new society.

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