

THE ROLE OF INNOVATION IN MAKING THE PROSPECTIVE EDUCATIONAL SYSTEM MORE EFFICIENT

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Summary

The innovations in different fields will be the main source of the most radical changes in education for the next twenty-years. Innovation in education can be realized in three dimensions: curricular, pedagogical and organizational having the purpose to prepare young prospective generation ready to be integrated to digital society of the 21st century.

Key words: *blended education, internet technologies, innovation, teaching-learning process, learning to innovate, learning content, education.*

The impact of “global innovation” is seen in all areas: culture, economy, technology, and social and personal life in the 21st century. Global innovation processes are followed by fast development in all aspects of social life, as a prerequisite for economic growth and improvement of quality of life in any country is an innovative activity. This depends on the state's economic and technical-scientific potential, innovation policy and resources, the spiritual state of society. In the market economy, competitiveness requires on going creativity and innovation. Innovative activities do not happen in the form of campaigns, and no manager has a consistent support in order to plan clear deadlines for conceiving innovation as it cannot anticipate or expect immediate recovery of energy, money and investment efforts time for experimenting and launching new products and services.

Only change always gives the opportunity for something new and special. That is why innovation supposes an organized search and a well-defined purpose of change and a systematic analysis of the opportunities that they could offer to economic or social innovation.

Usually innovative activity is characterized by uncertainty and high risk, difficult prognosis of results, making Republic of Moldova as a "learning to innovate" country - an early stage in this field. In this context, the interaction of the innovation policy with those that would facilitate the orientation of the innovation activity towards the efficient capitalization of the resources becomes very important, otherwise the contradiction between the development of the society and the personality becomes deeper [8, p. 23].

So the education development directions are influenced by the cultural mutations and the scientific progress, by the economic changes, by the management of the natural resources and by the valorization of the ecological environment (the problem of the contemporary world), by the socio-political changes that highlight the future society trends, and to focus on the facts of the future [7, p.83].

According to our point of view, the education changes, being reported to the new dynamic of the social phenomenon, needs a future and global approach in which industrialization, the technical-scientific revolution has provoked extensive research, including the future. In this context, the education should be seen in a prospective way as a complex phenomenon, whereby education has to assimilate the change, but also guarantee the formation of change management skills for formal education, regardless of the professional field.

Because of both chaotic and planned fast changes brought about by innovations, we are challenged by a rethinking of education systems and economic and social structures, and efforts are being made to adapt society to future aspirations - prospective vision.

In order to make the prospective education system more efficient, the Social Research Council and the Work on Technological and Social Innovation in Canada are proposing, with a view to establishing a more effective definition of innovation in education, three dimensions:

- curriculum dimension - innovation at level of school curriculum;

- pedagogical dimension - innovation in the educational process;
- organizational dimension – innovation at the level of structure, roles and functions performed by people involved in education [10].

Beginning from these dimensions, the innovation from education is defined as a "deliberate process of transformation of practices by introducing a curricular, pedagogical or organizational novelty that is disseminated and aimed at the sustainable improvement of the educational achievement of pupils and students" [10].

• *Innovation at the level of educational structure and organization.* The analysis of the process of innovation in education is directly related to its structure and organization: centralized education or decentralized education. Decentralization of education generally means the total or partial transfer of responsibilities (funding, recruitment, staff remuneration, curriculum, etc.) from central to local level, or even at the level of educational institution [9, p.114].

To be able to innovate, it demands a large number of actors, because the innovation process involves the achievement of new knowledge, new views, different perspectives on the same issue, negotiation, conciliation, etc.

• *Innovation at the level of content* follows the level of system structure and organization, because even if we are only referring to the extension of the compulsory schooling period, we find that this requires a new ordering, succession of knowledge, skills, abilities, how they are transmitted and formed to learners. Innovation at the level of content is necessary because: on the one side, the totality of knowledge and information accumulated at the level of society is impossible to convey and convey through the content of education, however extended the schooling period, and on the other side they have become not only very numerous, but even unnecessary in some cases, so that between the moment of the beginning of the schooling and its completion, what the individual has learned may no longer correspond to the requirements of the society and the current economy.

That is why, lifelong learning has been developed to avoid professional exclusion from the labor market. Decentralization of the education system allowed the introduction of optional subjects, the curriculum at the school's decision, the educational offer being adapted not only to the needs of the individual but also to the community. Concerns about content innovation have emerged since the 1970s, with the accelerated development of science and technology and the introduction of Information and Communication Technology (ICT) in education [9, p.116].

Today, the education system has to face a challenge: the use of digital technologies in schools. The ICT field is an important innovation factor, although education has had the biggest role in developing society during centuries.

Today, the influence of the Internet on the content of education is an important problem that specialists are discussing. ICT can be used to educate the population: organizing courses / hours via television, the Internet, using it as a didactic tool. Innovation can also act as a way of solving problems that young people are facing today: the development of science and technology have considerable advantages but also major risks such as isolation of individuals, the development of artificial communication relationships. The introduction of ICT into the learning process can partially smooth these problems.

The way in which education can open up to the technological progress in the field of ICT, in turn, increases the access to learning and teaching, and in this way transforms our education system. As a result, education transformation cannot be done without innovation!

Learning is a process of research and collaboration and it is based on critical, innovative thinking that allows for changes in teaching methods, the role of teachers (the teacher acting as a mediator in promoting learning) and the role of students/students.

Modern technologies have not an expensive price for end users and can be quickly included in the educational process. Since the creation and transmission of modern technologies by their nature are the trans-border process, they set new requirements for the architecture of the education system, which in the future should also be defined globally.

Education has an important role in the society, being accompanied by a cultural start-best investment practices now become "start-ups" acceleration, at the heart of which is the educational process (project-based learning, mentoring, business learning skills).

Another element of innovation is the type of skills to be formed to people where borders no longer exist. In a knowledge-based society, education systems have an obligation to protect their citizens by providing them with the necessary school and professional training. If in the past the education was based on an individual process that was between the teacher and the learner, now takes place a change of how the educational ways are done "mass education". However, the decrease of pupils/students number, focusing on skills development allows the transition to lifelong learning, in small groups or individually. And with the appearance of innovations in different fields, the professional sphere becomes the place where new competencies are received, where education develops references for career, continuous training that determines the possibility of self-actualization.

In this way, the profile of personal competences will be restructured and changed throughout life in several ways. Skills diplomas - the next step in developing education and labor market infrastructure, the emergence of competence models, will make training much more controlled by the student and the labor market than the education system.

Now, the new curricular vision no longer focuses on educational content (as is the case in traditional training, content being considered as the main vector of instruction), but on the formation of complex educational skills.

The European Commission has launched a document on the European training profile, structured on eight areas of competence [10]: communication in the mother tongue, communication in modern languages, mathematical skills, science and technology, digital competences, metacognitive skills (learning to learn), interpersonal, intercultural, social and civic competences, entrepreneurial skills, awareness and cultural expression. Another institution concerned with the issue of innovation in the content of education is UNESCO, where the International Bureau of Education (BIE) operates.

The latter proposed redesign and renewal of the content of education from the perspective of four "pillars" [10]: learning to know, to learn to do, to learn to be, to learn to live together.

The finality of this approach is to enhance the functional character of the knowledge and acquisitions that will be applied in new situational contexts in problematic situations. In the current educational context, "knowing" is no longer the main aim but a mechanism that provides the premises for "knowing how to do", "knowing to be", "knowing to live together" and "knowing how to become ". It is obvious that between these dimensions of personality there are many interactions, they form a whole [4, p. 43].

The appearance of innovations in different fields changes the structure of employment in the economy-in particular, by virtue of not only manual but also routine intellectual work, it is inevitable that a large number of "useless" people have not been sufficiently adaptive and have not found a place in the new sectors. The transition of people to new changes can be made easier if the education is seen as main. Educational institutions require preventive preparation for this transformation-besides, the space prepared in the prospective vision can become virtual worlds (including specialized ones), which act as spaces for "overexposure" and re-qualification of the "too high quantity" of people.

To have a change at the level of content, structure and organization of education and lead to sustainable results, is important to have teachers` support. An important aspect in education is that what is to be borne in mind is the mentality of the teaching staff, argues G.Neagu [9, p.116]. In the digital era, the teacher needs to feel free to respond critically but at the same time creatively to new technologies or requirements.

The educational system needs to be modified both from the perspective of teacher education and from the innovations of the educational process. We suppose that in any educational institution

there is at least an innovative teacher, but in the absence of an organizational school culture, that provides support for him so his ideas to become innovations, his ideas will not be transposed into facts.

Pedagogical innovation is needed from several perspectives:

- Promoting and building knowledge: In the educational process, the school must prepare the student / student to develop creative thinking and creativity to become a person able of solving any situation in the best way today and prospectively.
- Student / Student's Future: The world in the digital age has undergone many changes and also in the education system in order to prepare the young generation for the future and the integration into the digital society of the 21st century.
- Promoting learning, teaching and evaluation: learning, learning innovation is meaningful for learner-centered learning environments:
- A learning environment that has become a joyful mix with the computer.
- The digital teaching process allows the teacher to apply different methods of work, changes patterns of interaction between pupils / students and devotes more attention to differences between them.

The main characteristics of an innovative teacher, mentioned by researchers [apud 9, p.117] are cooperation, collaboration, trust in others, desire and will to innovate. This proves that the innovation in education has nothing to do with the age of the teaching staff or the teaching subject, the level of education teachers teach etc.

The blended learning becomes an opportunity for new society requirements. This type of learning is an opportunity to create experiences that can provide the right kind of teaching and learning at a certain time, place and for a certain student / student not only at school / university, but also at home. This type of learning becomes global, transcends the formal boundaries of countries and brings together groups of pupils / students from different cultures and places. In this context, generalizing the use of ICT in school/university could become one of the important achievements of our century.

Changes in education need to be achieved because we live in a world based on competition and efficiency, whose strength lies in knowledge.

Knowledge is seen as a kind of processing, which will reach higher levels as the student's mind will be programmed with the help of as many meta-cognitive strategies. Metacognition is a desideratum of new postmodernist orientations promoted by constructivism advancing active learning, building knowledge through research, research, and thus contributing to the development of cognitive capacities. *Metacognition* assesses the level of cognitive development that allows the student to self-assess and self-regulate their own learning. In this sense, metacognition takes the form of an "internal dialogue" of the student that induces a reflection on what he does, how he does and what he does. Metacognition is important in knowledge / learning because it places more emphasis on construction processes and on their manufacturing conditions than on products. Referring to the student, J.S. Brown believes that four factors intervene in this kind of cognitive self-knowledge: the student knows how much he knows, knows what he knows, knows what he needs to know and knows how to use the intervention strategies [apud. 2, 3, 5, 12]. And this is, says D. Sălăvăștru "a key factor of the control the individual can exercise over his thinking" [6; 12, p.65].

In a completely different way, in the socio-cultural tradition, knowledge is understood in terms of learning to use cultural instruments. As a consequence of the fact that they are always specific to certain socio-historical contexts, it is difficult to draw out learning models that are generally valid, except for some cultural instruments that go beyond at least a few different contexts. In the digital age in which we live, the knowledge paradigm must be one of dialogue, education must go beyond the specific cultural instruments, but without being abstracted.

The development of education towards dialogue can only be the result of a teaching-learning-assessment activity at a higher conceptualization level than in the past. Because the dialogue

involves opening, widening, this learning is both an individual direction for the pupil / student and a social one for the school as a whole. Developing towards free creative thinking can be promoted by removing constraining factors and encouraging the exchange of perspectives among pupils / students.

In the socio-cultural tradition, ICT is seen as a tool of mediation, and from a dialogical perspective it is seen as a means of opening, deepening and widening the aspirations of dialogue. We must not forget that learning involves not only accumulation of knowledge but growth, enrichment, evolution. Modern technologies are not something out of the ordinary. Papyrus and paper, chalk and printed books, projectors, toys and educational programs, all were seen as innovations at the beginning. The PC, the Internet, the CD and the latest mobile or wireless complementary technologies are just the latest proofs of human creativity that we can see around us. Like the other innovations mentioned, they *can be assimilated into pedagogical practice without affecting the fundamentals of learning.*

The use of ICT in the educational process is part of the natural evolution of learning and suggests an elegant solution to the modern challenges to learning and the needs of students / students. The integration of ICT in the traditional teaching-learning-evaluation process is an opportunity to integrate the latest technological breakthroughs with the interaction and involvement of the traditional way of knowing.

However, we have the spread of new technologies in child and family education that offer not only advantages but disadvantages, too. Often, the issue of "plaid children" is being discussed - the new "Mowgli, Computer-Learned". Current problems and existing interfaces with "threat of plans" are not systemic; the rapid development of technology in the future years will allow to build a better environment around the child (whether it's his own room, playing in the kindergarten or entertainment center in a big store) into a model of the world in which reality, virtualization and augmented reality of staff complement each other.

However, in the future, we can expect more underestimated but more serious problems in the formation of mental complexes, in particular: "New Dyslexia", when complex cognitive actions (correct spelling) words, abilities of complex search of information, configuration of devices, etc.) are supported by automatic services and consultancy services, and the ability to engage them gradually becomes atrophied.

The "floating" morality and the image of the world, when the main development environment for the child are the virtual worlds with arbitrary design of laws and physical and ethical regulations, but the basic motivation system consists of new stage achievements of games, the design of the world of games will lead to a representation of the world - and a highly unstable generation and system of values distorted (from the point of view of the present) of the system of values that begin to contradict the tasks of individual and society development.

These threats show a basic difficulty of new education. New technologies take into account the residual principle of the goal of human personality development and human society. The consequences of the new technologies for the brain of the new generation have not yet come. But the responsibility for their failure lies precisely with the producers of new software solutions and virtual worlds. Programmers need support so to develop good content for forming children's conscience. This means creating some rules for interfaces intended for use for different ages. To the limit – the need to adopt a developmental paradigm in the software architecture as a key.

One of the most important and extremely uncertain factors in new education is the spread of internet. Governments in many countries are trying to control and limit the spread of global content over networks. Because educational content from a number of traditional countries is one of the possible threats to their intellectual and spiritual security, censorship can be directly addressed to the regulation of educational content provided through the Internet.

The appearance of individual training demands from the employer and investors will stimulate the development of a self-management education system and the appropriate educational

marketing infrastructure. In part, there are expectations of emerging standards indicators from the perspective of describing competency-oriented programs. Increasing the demand for authenticity-looking for opportunities to develop a unique pathway in life, focusing on deep interests and trying to find maximum potential discoveries.

We consider very important for *education* to migrate more and more into that form, linked to the development of authenticity, returning the teacher's initial meaning and content. A part of the methods that are today accepted as personal qualities development, to the extent of changing the paradigms of "lifelong learning", will be integrated into the unique development system of the individual. The process of self-development in life – according to the sense, accompanying life itself - will become that axis that will impose prospective educational forms. The prospective term, argues G.Berger [1. p.11) initially meant an attitude, characterized by the need to make informed decisions, taking into account not only the consequences of the past situation or the exigencies of the present situation, but also the implications of these decisions in time and in the future.

In our opinion, prospective education is a forward-looking activity, being oriented, through its finality, towards the future. Therefore, the assimilation of change in the education system implies the assumption of the direction of change, as well as the adequacy of the curricular content to the content and the rhythms of the changes in the field, which can only be achieved by applying the invention, the initiative and the innovation by the teachers. At the same time, the unique key to the new economy is not a single person but a team capable of performing functional tasks or projects related to skills training, working to change and sustainability.

Innovation has the aim to identify solutions, opportunities, strategies, through which the educational ideal will be reached. Problems arising with the reform of education may sometimes lead to inequalities in the face of education - individuals belonging to national minorities may have difficulty in understanding the content of textbooks, those with different forms of disability need technical or intellectual support, individuals who have left the school may decide at some point to return to the system to continue schooling, etc.

In these cases, innovation can identify solutions at the level of content, organization, financing, etc. Also, the difference between reform and innovation in education is also given by the fact that, while the first is imposed from the central level - from the top down - and has a high degree of generality from the beginning, the second, *innovation* can go from the level of an educational institution, from the level of a teaching staff, researchers, a group of partners in the field of education - from the bottom up - and it is only when it proves its efficiency that it is taken over at a wider level.

In conclusion, we affirm that both innovations and awareness of the need for correct and sustainable development have given weight to education and its finality. Developed countries have been working on improving education systems so that they are in line with socio-human and technical-scientific development trends.

In order to make the prospective education system more effective, it is necessary to understand that:

- the future depends on the efforts made, it can be created;
- the future is variable, it does not come from the past, but depends on the decisions of the participants and the stakeholders;
- there are areas in relation to which the future anticipation can be made, but in general the future cannot be reliably predicted, it is possible to prepare in advance or to prepare the future in the way that we want it to be.

Current education is characterized by incipient forms of innovation but which, through a sustained intervention both inside and outside the system, has all chances to become a system constant. At the same time, the social phenomena of the 21st century require the need to develop educational concepts and policies, so that human resources contribute to the intensification of the process of change at the national level, but also to meet the challenges of globalization, to contribute to sustainable development.

In the literature, sustainable development is defined as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs" [11, p. 14]. Consequently, the way in which the world is developing, the innovations, is largely related to how education can meet the requirements of this development.

The main features of innovation in education are:

- Innovation proposes a measurable improvement (increasing the level of education of the population, school attendance rates, results, educational achievements obtained by pupils at different exams, national and/or international tests etc.); innovation must be sustainable (decentralization of education);
- Innovation must be a deliberate action that contributes to the school success of as many people as possible (extending the compulsory schooling period, which manages to maintain in the system the school population at risk of school drop-out, educational inclusion programs in the system education of people with disabilities, socio-economically and socially disadvantaged people, adults, etc.) [9, p.112-113].

As prerequisites for performance in education, creativity and innovation capacity have an important role, and the goals that contemporary education institutions should take into account may be the following:

- encouraging the use of ICT as a means of creative expression of one's own personality;
- raising awareness of the need to perceive innovation as a way to promote sustainable development;
- to be innovative, it is important to develop prospective skills, focusing education policy on the needs of present and future;
- including the innovative dimension in the initial and continuing training curriculum of specialists in various fields, as they aim at change and sustainable development respectively;
- innovative thinking starts from creative ideas.

Cultivating innovative thinking has become an important task for contemporary schools. Stimulating creativity can be achieved through sustained and elevated theoretical and practical training; boosting initiative and independent work, scientific critical spirit; to stimulate independent documentation and experimentation; receptivity to us; passion for science in accordance with each one's abilities.

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