Computer-Assisted Training in the Conditions of the Emergence of Devices

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Abstract: The pandemic has created in the educational community not only a discomfort in terms of the health of each member, but also a chaotic use of all IT devices. Under these conditions, the usefulness of computer-assisted training in the curriculum of primary, secondary, high school and higher education is analyzed.

Keywords: pandemic; devices; computer assisted training; curriculum

1. Specific Considerations About the Emergence of Devices

Through our study, we try to clarify, as much as possible, some important aspects of the "invasion" of computer equipment in the life of educational institutions of all grades and, by way of consequence, in the professional existence of the two elements that define the didactic process: the teacher and the student. Beyond this certain fact - the emergence of devices in school life - we are left with a series of uncertainties which, in our opinion, become challenges in the medium and long term for the evolution of both the teaching profession and for the personal and professional development of current students from the three cycles of tertiary education.

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First of all, we must clarify, both for students and for teachers, the term found in the title of the current study: emergence. Of French etymological origin – émergence – the term defines, figuratively, a form of change seen as the actual birth of something completely new.

In the space of tertiary education, in particular and, in secondary education, in general, this effective birth of the new tends to become a certainty populated by many questions that seek their due answers, justifiably, in the sciences of education.

Consequently, our study sought to clarify the terms that today are used in various educational circumstances with different, sometimes contradictory meanings: digitalization, digitization, digital revolution, digital era, emerging digital technologies, etc. Considering the fact that a systematic digital pedagogy does not yet exist, we tried to carry out an analysis based on the identification of risks or threats, on historical and contemporary data, publications and current documents of a strategic nature, with the objective of a finding judgment in relation to the community articulated academic of which we are a part: Danubius University of Galati.

2. Point of View about the Digitalization Phenomenon

The need for digitization is being talked about in all environments (political, business and media, education, culture) lately. In the full era of modern technologies that increasingly penetrate almost all aspects of private, economic and political life, the need to adapt to the trends, rhythms and new coordinates imposed by them have become a problem not only of advancement and modernization but even of avoiding the danger of falling into irrelevance and inefficiency.

The history of the Internet dates back to the era of the Cold War and the communication networks developed, with priority by America, following the launch by Russia of the first satellite - the first man-made object ever to reach the Earth's orbit - in October 1957. Shocked by the achievement of the rival or, America has allocated large resources to the development of new communication technologies. The goal was to develop, in particular, communication networks capable of functioning even if an atomic disaster were to destroy a large part of the network itself.

At the global level, at different rates, digitization takes place as a necessity of integration within the limits of the infrastructure established by new technologies.

These not only take over from human's tasks that used to be done manually and repetitively, but they can even create by themselves, entire specific, fully automatic processes that do not need the intervention of people.

Thus, the technology that triggered a real digital revolution does not change the paradigm only in singular fields, or certain branches of the economy (finance, production, etc.). Major changes are already being felt in the entire way of social interaction, but also in work relations and interactions with institutions.

The new methods that today are already transforming the labor market in ways that only a few years ago were only a possibility of the distant future - working in a remote system, online platforms for the realization of various projects on which employees can work from various locations and even different countries , the live, online collaboration tools that benefit from VPS hosting servers in the cloud have led to an unprecedented flexibility in work organization. The entire philosophy of work-employee-employer-money relations is already changing, and the process is in an accelerated phase of development.

In this context, the digitization, both of the state as a whole, with all its component institutions, as well as of the private environment, which already has a considerable advance in this regard, is no longer an optional matter or only a matter of the future.

Issues for debate:

1. Is there a paradox? There is a boom of devices in Romania and in the world, complemented by an internet speed and structure among the best in the world, but the stage of the digitization process places us in 26th place out of 28 in Europe, according to official statistics.

2. What is education in the digital age? Education in the digital age includes but is not limited to digital education and encompasses the transmission of technical, 'soft' and citizenship skills and relates to both formal and non-formal education throughout the life of European citizens.

3. What is the condition of education in the digital age? Rethinking education in the digital age is therefore a prerequisite for the future global competitiveness of Europe/Romania. Second, only education can ensure the preconditions for social inclusion and equal participation of European/Romanian citizens in a digitalized democracy.

4. What is the role of education in the digital age? Therefore, rethinking education in the digital age matters for protecting European/Romanian values such as equality, democracy and the rule of law.

5. Is digitalization of education an obligation? Digitization of education is no longer a dream, but an obligation. Specialists in the field say: "It is not enough that schools have access to digital tools, but it is important that the teacher knows how to use them."

6. Digitization of Romania - the current stage of the implementation of new technologies;

Digitization means progress and growth, very large sums being spent globally for the transition to digitization. It is already a recognized fact that every industry that benefits from this trend in which operations and relationships are completely digitalized or at least improved from this point of view, will generate a growth far superior to the classic operating models.

The European Union, of which Romania is a full member since 2007, does not yet fully benefit from advanced technologies in order to use them in innovation and remain competitive on a global market that is already in the process of change.

Romania has one of the best internet infrastructures not only in Europe but even in the world, the speed or bandwidth index placing the country in 3rd place in the world behind only two other countries - much smaller - Singapore and Hong Kong. Also, the IT industry in Romania is one of the fundamental pillars of the economy, surpassing, in some years of the budget reports, turnover and income of other classic industrial sectors.

Paradoxically, however, Romania is in the penultimate place in the European ranking in terms of digitization, occupying an honorable place 26th out of 28 states analyzed by the statistics of the European Commission.

The problems and factors that led to this paradoxical situation have a complex nature, and their combination has led to the unsatisfactory results of today.

These factors mainly relate to:

a. The underfunding of education and research systems over several years in a row, which created the conditions for a reduced digital literacy in the population as a whole, but also for the lack of chances for the emergence of new valuable ideas with exploitation potential in the field. The lack of investment in research led to the

almost irrelevant reference of the Romanian reference field in the European concert.

b. The lack of vision and the non-application of a unified strategy at the governmental level regarding digitization have led to disparate progress and the creation of only a few "digital islands" as a whole, which is totally insufficient for obtaining good results. Investments in digitization do not only mean the acquisition of equipment and technologies, but the attraction of the research-development system and its congruence with the goals pursued.

c. The lack of specialized and highly qualified personnel at the governmental level is another impediment in the field of digitization of Romania as a whole. Although the salary level of civil servants in Romania is generous, the same thing does not happen in the case of IT specialists employed in the public sector, who are much more attracted by the salary levels in the private sector and, obviously, are oriented towards a career in this direction.

The period immediately following will be of particular importance for the goal of digitizing the state as a whole, its institutions and the economy in general.

In this perspective, the Authority for the Digitization of Romania promises to translate into reality a number of projects that vary from the development of tools and the framework for the development of the concept of e-government, to centralization and administration systems of databases in the fields of health or civil status.

Also, in this sense, with the support of the Romanian government, two important projects for the education system will be implemented, which will contribute to the digitization of the system.

I. The "Virtual Library", with an implementation duration of 2 years, will represent a digital platform with open educational resources, with a preponderance for the secondary school level, facilitating free access to electronic textbooks, alongside other electronic educational resources such as games or auxiliary materials;

II. The "Electronic Catalogue", with an implementation period of 3 years, will develop an online platform that will be used, on distinct levels, both by school management, by teachers, students and also by parents, at the same time creating accountability for all parties involved through access to information on student assessment and absenteeism.

These projects, together with the "Integrated National Platform - Wireless Campus" project, which is already being implemented, constitute concrete actions in support of education in transition to a digital era, in which technological advances in various fields and study methods require a degree high digitization of the education system.

And because we talked, in the lines above, about the digital age, Digitization, digitization, we are trying to explain these concepts.

1. The so-called information age/digital age is an idea that the age we live in will be characterized by people's ability to transmit information without restrictions and access information in a way that was impossible in the past. The idea is related to the concept of the "digital revolution", which includes the idea that the next step after the industrial revolution is the transition to an economy based on the transmission, processing and storage of information.

2. Digitalization: There are no clear definitions of digitization. Initially, digitization referred to the conversion of analog formats into digital formats. Currently, it mainly involves equipping analog objects with information and communication technology. Books are a perfect example of this.

3. Digitization: Digitization is a procedure by which data in analog format is converted into electronic format, essentially creating a digital image or digital form of a report, object, photograph, audio material, or signal. Nowadays, the digitization of data takes the form of binary digits, being processed by a computer or other procedures. More specifically, it is the conversion of analog source material into a digital form.

4. Emerging technologies: A new conception of learning through eLearning.

3. Case Study - Computer-Assisted Training in the Conditions of Emerging Devices

We start from the following question in this case study: Is computer-assisted training still useful in the school curriculum in the current post-pandemic conditions, in the context of emerging technologies as well as all the devices that have a specific "boom"?

In order to answer this question, we will present some problems regarding computer-assisted training and the emergence of devices and technologies that currently exist.

Computer-assisted training (CTA) is a way of individual training of pupils or students, through computer programs (educational software), which directs, step by step, the path of their own learning effort. Educational software can be composed of: information and documentation software (such as encyclopedias on CD), communication software, simulation software or software for educational games.

The characteristic elements of the CTA are:

-CTA is a training method in which the student goes through a training content at his own pace and through independent effort with the help of a program of a certain type that ensures the possibility of self-verification after each step. The computer has the advantage of combining the image, the sound and the commentary in the most appropriate way, so that they stimulate the student's participation, without the need for external intervention.

- The application of CTA imposes a number of requirements.

-Students must be introduced to the appropriate execution techniques, the segmentation of training content into informational units that respect filiation and extension relationships. Specifying the students' concrete activities in relation to each content unit, so that they take on controllable forms. Directing the process of formation of notions through the game of examples and counterexamples.

- The anticipated specification of the learning strategy that ensures the formation of the desired behaviors and specified by the operational pedagogical objectives.

-The anticipated specification of the training strategy, so that it corresponds directly to the learning strategy, aiming at a real differentiation of the training on a flexible problematization background, built from simple to complex. Control of mental operations through numerous exercises and applications.

- Prevention of typical mistakes, provision of recapitulation, fixation and synthesis sequences.

-Training in an effective way of self-control. An appropriate training environment is necessary, and the didactic programs must be in number corresponding to the groups of participants. The moments of relaxation must be placed after the activities to which the students were asked the most intensely.

Limits and disadvantages of using CTA

-These include the costs involved in using the CTA are extremely high, require special equipment and require a longer time for application. Research shows that

CTA has not become a mass experience anywhere in the world, its effects being minor for public education, its usefulness being recognized especially in extracurricular activities.

- The CTA can only be used in certain instructional moments of the lesson, to simulate phenomena in motion, to visualize evolutions that are difficult to reach for direct observation, to replace some experimental demonstrations that are difficult to achieve. It favors the gap in the students' training and requires important personal efforts that depend on one's own motivation (fatigue sets in faster). At the same time, it does not require active thinking, the students getting used to receiving ready-made information and for the assimilation of intellectual work techniques, a period of initiation and exercise is necessary.

- Emerging technologies are characterized by radical novelty (in application, even if not in origins), relatively rapid growth, coherence, prominent impact, uncertainty, and ambiguity. In other words, an emerging technology can be defined as a "radical and relatively rapid technology characterized by a certain degree of persistent coherence over time and with the potential to have a considerable impact on the socio-economic field(s) that is observed in relation to the agencies, institutions and patterns of interaction between them, together with the associated knowledge production processes, but its most important impact lies in the future and thus the emergence phase is still somewhat uncertain and ambiguous".

- Emerging technologies are varied: educational technology, information technology, nanotechnology, biotechnology, cognitive science, psychotechnology, robotics and artificial intelligence, energy.

"In March, it will be two years since the COVID-19 pandemic began to disrupt education worldwide. We are simply witnessing an almost insurmountable level of loss related to children's schooling," said Robert Jenkins, UNICEF's Head of Education. "While it is necessary to end disruptions to education systems, simply reopening schools is not enough. Students need intensive support to catch up on learning losses. Schools must also go beyond their basic role and contribute to rebuilding the mental and physical health, social development and nutrition of children".

Children have lost basic reading and arithmetic skills.

Globally, the disruption of education systems has led to the registration of millions of children who have lost the accumulation of meaningful knowledge that they

would have learned if they had been present in the classroom, the most vulnerable children and small ones registering the biggest losses.

• In low- and middle-income countries, children's learning losses caused by school closures meant that 70% of 10-year-olds could not read or understand simple text, up from 53% before the pandemic.

• In Ethiopia, it is estimated that primary school students have acquired between 30 and 40% of the arithmetic knowledge they would have acquired in a normal school year.

• In the US, learning losses occurred in many states, including Texas, California, Colorado, Tennessee, North Carolina, Ohio, Virginia, and Maryland. For example, in Texas, two-thirds of third-graders scored worse than their grade level in math in 2021, compared to 2019, when half of the kids had the same losses.

• In several states in Brazil, about three out of four children in second grade cannot read, up from one in two recorded before the pandemic. Nationwide, one in ten students aged 10 to 15 said they did not plan to return to school once their school reopened.

• In South Africa students are behind where they should be by 75% to 100% of a school year. An estimated 400,000 to 500,000 students dropped out of school altogether between March 2020 and July 2021.

The consequences of school closures are mounting.

In addition to learning losses, school closures have had negative effects on children's mental health, reduced their access to a regular source of food and increased the risk of abuse to which children are subjected.

• Growing evidence shows that the COVID-19 pandemic has generated increased levels of anxiety and depression among children and young people, with some studies showing that girls, teenagers and those living in rural areas are more likely to experience such problems.

• In the time that schools have been closed, more than 370 million children around the world have not benefited from school meals, which for some children has meant losing their only safe source of daily food and nutrition.

Taking into account the effects of the pandemic on the world educational population, we can draw the following conclusions:

- All the devices converge towards an emergence superimposed with emerging theories

- Many students use these devices without proper training. Everyone knows how to use tablets, phones, laptops and other devices, but what is the basis, for what?

- Another category of pupils and students do not have access to these devices, so the educational base does not exist here either.

Taking into account the above, we can answer the question with which we started this presentation: Is computer-assisted training still useful in the school curriculum in the current post-pandemic conditions?

Concluding, our answer to this question is a positive one because there is no such training at the level of the new generation to reduce as much as possible the "chaos" in the use of these devices and for there to be a medium and long-term utility regarding this topic.

4. Instead of Conclusions

Digitalization remains the essential priority for action both for the public administration and for the business environment, reaching the highest degree of coverage being an essential premise for the accelerated progress of society as a whole and for a somewhat faster recovery of the gaps compared to developed states.

Digitized education and educated digitization are the coordinates of a developed and dynamic economy, and Romania is making efforts in this regard.

The modern teacher is forced to successfully fulfill several roles, among which those of mentor and friend are essential, he must convey emotions to his students, be human, recognize the moments when he makes mistakes, be able to recognize the fact that he does not know certain information but to document himself about it.

Therefore, the digitized context can be a favorable one for both the teacher and the pupil/student, as long as the teacher knows the mechanisms by which these digital tools can be applied in the teaching process.

Centering learning on the pupil/student implies dedication, involvement, the desire for development for the people in front of you.

I synthesize some characteristics of student-centered learning:

- Active participation of students/pupils in their own knowledge.
- Building knowledge by students based on the knowledge and skills they have.
- Promoting collaborative work.
- Monitoring your own learning process.
- Activation of intrinsic motivation.
- Promoting authentic learning.
- The teacher's offer of the necessary help to overcome the difficulties.

And one last conclusion:

Adjusting to online school is a process that both teachers and students have faced, sparking intense emotions and fears on both sides.

It is certain that the integration of information technology in education will continue to accelerate and that online education will eventually become an integral component of school education.

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