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CHALLENGES IN THE DEVELOPMENT OF 21ST CENTURY COMPETENCIES

VERDEŞ MARIA-ROCSELANA*, BUZERA MARIUS**

* "Constantin Brâncuşi" University of Târgu Jiu, Faculty of Education Sciences, Law and Public Administration/
Technical College „General Gheorghe Magheru"

** Technical College „General Gheorghe Magheru"

Abstract: Education systems around the world are facing a defining moment, and today's decisions and choices will affect generations. In a knowledge society, characterized by an unprecedented technological progress, which brought the world before the fourth industrial revolution (the computer revolution), other skills and abilities are needed than a few decades ago. While the industrial revolution of the 19th century sought to simplify work tasks, the computer revolution initially affected repetitive manual activities, and with the development of artificial intelligence techniques, began to permanently replace human personnel in areas involving cognitive tasks such as (analysis , recognition, evaluation), considered unaffordable for cars until two decades ago. Because students who begin their studies this year will be adults upon graduation, schools must be ready to train them in those skills and abilities that will be the path to jobs that were not created, that capitalize on technologies that were not invented and prepared to solve problems that were not anticipated. Thus appears a new concept, that of Competences for the 21st century in which the emphasis shifts to lifelong learning, collaboration, communication, critical thinking and digital skills. Although it is a new concept, it has been approached in numerous studies and researches by a large number of private and public organizations in the educational or economic field, with different experiences and objectives, which have led to diverse and non-unitary approaches, which can produce confusion. This paper reviews the main studies and approaches in the field, identifies their common and divergent points and sets out some of the challenges to be overcome in developing these skills, along with moving education to the virtual environment and choosing the emergency online teaching strategy - ERT (Emergency Remote Teaching).

Keywords: 21st Century Skills, Digital Learning

Introduction

Society, as a whole, is facing a defining moment, and the decisions and choices we make today will affect generations. Education systems are facing unprecedented challenges due to the process of globalization and the rapid development of technology, which is why the future is uncertain and unpredictable (OECD, 2015, European Commission, 2020). For these reasons, educational institutions must be ready to form those skills that are the path to

employment for jobs that have not been created, for technologies that have not been invented and ready to solve problems that have not been anticipated (WEF, 2020).

Technology has dramatically changed the labor market by changing the tasks of employees in certain areas and complementing those of others, thus promoting competition in the labor market. While the industrial revolution of the 19th century sought to simplify workloads (Goldin and Katz, 1998), the integration of technology (the computer revolution) initially affected repetitive manual activities, and with the development of artificial intelligence techniques, it began to replace permanently human personnel in areas involving cognitive tasks such as (analysis, recognition, evaluation), considered unaffordable for machines (Guy M., Rauch F., Redding, SJ, 2016). An analysis of the US labor market, (Frey CB, Osborne MA, 2013) concludes that of the 702 occupations considered, 47% are likely to be computerized in the next two decades, predominantly affecting low-skilled employees and forcing them to relocate to tasks involving creative and social intelligence skills.

The pace of change increases, favored mainly by new technologies and the need matter for youth and skills such as adaptation, communication, ability to learn, to help in a global economy, the priority is labor mobility. Thus, the emphasis shifts to lifelong learning, adaptability to change, collaboration, communication, mediation, critical thinking and especially digital skills.

21st century learning refers to the dialectical interactions between theory and practice, individuals and communities, formal and informal learning (Lee, Hung, 2012). These new skills are known as 21st Century Skills and are considered critical to the success of young people in tomorrow's world (Lemke, 2003).

Frameworks For 21st Century Competences

Although the concept of Competences for the 21st century is a relatively new one, the interest shown towards it has been approached by a large number of organizations, so Dede (2010) draws attention to the risk of several concepts being brought together under the same names. Exactly different experiences and fields from which these organizations come, can lead to approaches lacking clarity and unity, when specialists end up using the same words but with different meanings - the problem of the Tower of Babel. For example, the OECD (2005) refers to 21st Century Skills as lifelong learning, in the EU the name of key

competencies is used, and in the US the term that has become entrenched is 21st Century Skills. There are several frameworks for 21st Century Skills, and some of the best known are:

- The Partnership for 21st Century Skills Framework (2006) - developed in the USA, by a national organization P21, formed in 2001 with support from the US government and several private sector organizations (Apple Computer Inc., Cisco Systems, Dell) (http://www.21stcenturyskills.org) (Voogt, 2012).
- EnGauge, was developed in 2003 by the Metiri and Learning Point Associates group in order to promote 21st century skills among students and teachers (Lemke, 2003).
- Assessment and Teaching of 21st Century Skills (ATCS), developed as part of an international project, sponsored by Cisco, Intel and Microsoft (Voogt, 2012).
- 21st Century skills and competences for new millennium learners, an initiative of the Organization for Economic Co-operation and Development since 2005 (OECD, 2005).
- Key competences for lifelong learning, a European reference framework, developed within the work program "Education and training 2010" (European Commission, 2018, 2020).
- The American Association of Colleges and Universities developed in 2007 a framework that defines the essential learning outcomes based on the knowledge and skills gained from a liberal education, providing a framework to guide the cumulative progress of students (AACU, 2007).
- ICT competency standards for teachers, is a framework that tries to identify those digital skills that teachers need to increase their performance. The framework was also created with the support of renowned technology companies such as Microsoft, Intel, Cisco, the International Society for Technology in Education (ISTE) and Virginia Tech.

Competences of the 21st Century

The comparative analysis of these frameworks can extract the core competencies of the 21st century to which they belong:

- Collaboration - in accordance with 21 CLD Learning Activity Rubrics (2012a), in the traditional school, students receive grades based on the individual activity done which does not prepare them for the workplace, where the emphasis is on teamwork to perform complex tasks. Young graduates must have the skills to collaborate, negotiate, resolve conflicts, take on tasks and share them, listen to the ideas of others and integrate them into a coherent whole. Thus, according to Towards Defining 21st Century Competencies for Ontario (2015), strong

collaboration skills are needed to work productively in a team and to integrate individual expertise and ideas into a coherent solution.

- Communication - according to Fullan 2013, communication in the context of the 21st century refers not only to the ability to communicate effectively, orally, in writing, and with a variety of digital tools, but also to listening skills. And according to 21 CLD Learning Activity Rubrics (2012b), 21st century communication can take many different forms, from informal classroom discussions, either face-to-face or online in which students articulate their ideas in a permanent way. Communication is seen as a necessity for success in the labor market, regardless of education level or type of work. According to Finegold and Notabartolo (2010), communication is an essential skill to function well in society and at work and to participate in an effective dialogue with others. The importance of communication competence was also mentioned in each analyzed framework.

- Critical thinking and problem solving - is described by Fullan (2013) as the ability to design and manage projects, solve problems and make effective decisions using a variety of tools and resources. The World Bank (2008) considers that critical thinking skills should become a feature of education systems around the world, as these skills are increasingly in demand in the global labor market. Harlen and Deakinm Crick (2003) refer to this competence, arguing that neglect of creative and critical thinking in assessment methods is a cause for concern, given the importance of these skills in preparing for life in a rapidly changing society and where lifelong learning is needed. Problem solving is considered the most complex of all intellectual functions, being defined as a higher order cognitive process. In today's workplace, problem-solving tasks are numerous and employees must be adept at generating and testing creative ideas to solve a problem with a real set of requirements and constraints (21 CLD Learning Activity Rubrics).

- Digital skills - in globalized knowledge-based economies, young graduates need more and more skills, not only to intelligently consume information and ideas, but also to design and create new information and ideas using technology. Today, technology means the full range of digital tools available, both hardware (computers, laptops, tablets and notebooks, e-readers, smartphones, personal assistants, camcorders, etc.) and software (any internet browser and multimedia development tools, social media applications and collaborative editing platforms). (21 CLD Learning Activity Rubrics, 2012a), and according to the P21 framework, digital skills are seen as digital literacy, consisting of three key components: Information literacy,

Media literacy, and Information technology literacy. Where Information literacy is the ability to select, evaluate, and use information efficiently and ethically, Information technology literacy refers to the ability to use digital technology, and Media literacy is associated with the ability to access, analyze, evaluate, and communicate messages a variety of shapes (Chu, S.K., W., Reynolds, R., Tavares, N.J., Notaries, M., Celina Wing Yi Lee. C., W., Y., 2017).

Conclusions and discussions

Analyzing comparatively these frameworks developed by both international public organizations and private organizations, the following conclusions were drawn:

- all frameworks agree on the importance of collaboration skills, communication, digital skills, critical thinking and problem solving but also socio-cultural environment. (Clarke, Dede, Dieter, 2008) (Dede, 2009) (Voogt, 2012).
- only in one frame appear competencies such as: Risk taking, Manage and solve conflicts, Sense of initiative and entrepreneurship, interdisciplinary themes, Core subject like economics, geography, government and civic.
- digital competencies are at the center of each framework being considered not only by the need to produce new information, but also to acquire new skills. Thus, their potential in the development of critical thinking, problem solving, communication and collaboration is highlighted. -referring to digital skills is done differently in many settings. Thus, in some it refers directly to digital skills, and in others it refers to ICT
- related skills such as: information literacy, technology literacy and ICT literacy.

The findings of Voogt (2008) indicate the central role of digital skills, being considered both as an argument for the need for skills of the 21st century and as a tool that can support the acquisition and assessment of skills of the 21st century they cannot be conceived outside the digital space and capitalized together with digital tools can considerably contribute to the acquisition of other skills. Moving education to the virtual environment and choosing the emergency online teaching strategy - ERT (Emergency Remote Teaching), increases the importance of IT tools and the possession of digital skills by both students and teachers. Thus, new challenges arise in the training of 21st century skills, mainly with the help of IT tools. These challenges shift the focus on: the process of choosing the optimal digital tools in relation to the objectives and contents, including pedagogical models for assessing their quality such as (RAT, SAMR, PIC-RAT, etc.) and the choice of methods digital pedagogy.

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