



## **A Systematic Literature Review of 21<sup>st</sup> Century Skills and Competencies in Primary Education**

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The current literature review the discussion of 21st century skills in the context of primary education. A sample of texts satisfying the predetermined inclusion criteria was analyzed (n=40), with the aims of synthesizing the proposed frameworks that are most cited by authors interested in 21st century skills and competencies in primary education (n=6) and the dimensions of the skills and competencies mostly emphasized and researched in the particular context, according to the literature review research questions. The results showed a particular interest in skills and competences related to the conditions of the information and communications technology development, globalization and the need for innovation. However, a need for research focusing specifically in the context of primary education was recognized.

Keywords: 21st century, skills, competencies, framework, primary education,

### **INTRODUCTION**

Wishing to orient education towards the future, the turn of the century found education stakeholders engaging in heated discussion over which skills and competencies should guide 21<sup>st</sup> century educational policy and practice. A number of frameworks were developed proposing combinations of skills and competencies and research has been conducted approaching the topic from different perspectives.

The current review is focused on the context of primary education and investigates the following research questions:

- Which proposed frameworks are most cited by authors interested in 21<sup>st</sup> century skills and competencies in primary education?
- Which of the 21<sup>st</sup> century skills are mostly emphasized and researched in the context of primary education?

The discussion of the 21st century skills and competencies in primary education that develops within the context of this literature review is considered particularly important on the basis of the recognition of the changing conditions in the personal, social and professional life. Although the world of tomorrow remains an unknown territory, it is

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significant that educational stakeholders are orienting their efforts to this. Given the complexity of the issue and the multiple aspects of the skills discussed, sharing the same or, at least, a similar perception of the involved concepts can serve as the basis for a more fruitful discussion.

### **THEORETICAL FRAMEWORK**

Since no formal public education system existed before the 19<sup>th</sup> century, the current educational system has been designed on a clearly defined idea of academic and professional ability that conformed with the dictations of the industrial revolution (Robinson, 2007). Conditions have changed since then, though. Globalized political, social and economic systems coupled up with competitive market rules have led to a massive growth in the knowledge generation, management industry and information communication technologies (ICTs). This has had a profound effect on educational institutions, changing the conditions for policy-makers and educators and challenging concepts that are taken for granted, such as knowledge, information and ability (Zajda, 2010).

Whatever the era discussed, the identity and processes of education are built based on its purposes. It is the goals set for each educational system that determine the areas held of importance, the skills and competencies to be developed within the school practice, the beliefs that will guide the decisions, the means to be used. Educational systems have four core purposes, the economic, the cultural, the social and the personal one (Robinson, 2013).

Countries invest in education on the expectation that it will contribute to their long-term economic well-being and sustainability. The problem, nowadays, is that although imperatives in the world of work have changed, education has not. The IBM 2010 Global CEO Study revealed that in the business world what is held of importance today is creativity, an ability much underestimated in the conditions of the industrialization imperative (<https://www-03.ibm.com/press/us/en/pressrelease/31670.wss>, last access on December 15<sup>th</sup>, 2017).

Another aspect of education is related to deeper issues of human and social development rendered of crucial importance if a contribution is to be made to the more basic needs of a society where reorientation of priorities is an urgent necessity (Senge, 2009). This discussion over the priorities of education is not a new thing, however. Since decades ago and the first profound technical advancements scholars reflected on the danger of the world dehumanization. Back in 1972, in a period when technological progress was only starting to affect human lives, still at a very low level compared to nowadays, the Faure Report for UNESCO rang the bell that education was more “utilitarian than cultural” (Hargreaves, Lieberman, Fullan & Hopkins, 2009).

A new report published for UNESCO by Jacques Delors (1996) twenty-four years later presented four recommended pillars for the education of the new century: learning to know, learning to do, learning to live together and learning to be. However, Zajda (2010), expresses his concern that even a decade after the publication of the report, those four concepts, and especially “learning to be”, remained hard to truly understand

and effectively apply in the classroom practice. They are, however, all the more important in the context of multicultural, heterogeneous societies of the twenty-first century, where the co-existence of different values and cultures result in tension, disorganization and conflicts.

Even if the technological revolution is, probably, the most visible sign of the times, education has also been charged with a more essential core responsibility, that of constructing a culture of peace and tolerance in a world of constant political, social, geographical, economic and conceptual changes and conflicts. The cultural purpose of schools is to help students develop their conceptualization of the idea of culture in its depth, the processes that form value systems, the way we have been raised to take some things for granted, the realization that this is not the same for everyone in this world, the ability to accept and respect what is not the same with us (Robinson, 2013).

The education of the present and the future needs to set new goals, focusing on the development of an identity of a responsible and effective national and global citizenship in students, with all the knowledge, skills and attitudes that this requires (Zajda, 2010). Interdependence is a notion that is increasingly discussed, as its importance and impact on contemporary human lives is currently being discovered. Contemporary education has a new challenge to face, it must aim at the development of a generation of people who will be able to comprehend the aspects of interdependence and evolve within it, a generation of “systems citizens” (Hargreaves, Lieberman, Fullan & Hopkins, 2009).

Within these conditions, the 21<sup>st</sup> century gave birth to a new approach to the skills that are rendered essential for students to be able to experience academic and life success. Several educational and professional institutions have proposed relevant frameworks that include numerous skills and sub-skills, taking into account the current social and economic conditions. In the relevant literature, they, often, function as a basis for the discussion of educational theory, policy and practice. It remains an issue, though, that this is a basis characterized by complexity and vagueness of terminology, also depending on the perspective of the institution. As a result, the potential ambiguity of the terms leaves room for various differentiated interpretations, which, consequently, affects the development of both theory and practice. In the discussion of the relevant texts that follows, the author attempts to critically analyze and synthesize the frameworks as well as their interpretations in the context of primary education.

## **METHOD**

### **The Research Stages**

The research method chosen for the investigation of the research questions is the systematic literature review. The particular research method is considered appropriate because it can contribute to a synthesis of the existing academic literature in a reliable as well as accurate manner (Van Laar, Van Deursen, Van Dijk & Jos de Haan, 2017). Furthermore, it allows the application of an element of analytical criticism to the discussion of the synthesis (Hart, 1999).

The selection criteria presented in Table 1 were determined before the database search and were applied during the screening of the texts titles and abstracts and whole texts.

Table 1  
Inclusion and exclusion criteria

Type of criterion	Criteria	Inclusion	Exclusion
Type of publication	Journal articles	x	
	Conference papers	x	
	Reports	x	
	21st century frameworks	x	
	Dissertations		x
	Books		x
Access	Online	x	
	Paper		x
Publication period	2000-2017	x	
Place of publication	Worldwide	x	
Type of study	Empirical investigation	x	
	Theoretical studies	x	
Research methods	Qualitative	x	
	Quantitative	x	

The search action was conducted with the use of the ERIC and Google Scholar databases, both of which give access to comprehensive lists of education related articles. The core search terms were “21<sup>st</sup> OR twenty-first century skills” AND “primary OR elementary education”. However, a variety of similar terms that are often used interchangeably in the literature were also used. In particular, with regards to the concept “21<sup>st</sup> OR twenty-first century skills”, this has, also, been searched through the terms: “21<sup>st</sup> OR twenty-first century competencies”, “21<sup>st</sup> OR twenty-first century literacy”, “21<sup>st</sup> OR twenty-first century learn\*”.

The search action returned 116 results. The references sections of these texts were studied in search for more, relevant texts. This snowballing process resulted in the addition of 18 more texts to the sample. After the exclusion of duplicates and texts that did not satisfy the inclusion criteria, 40 texts were selected for analysis.

### Sample Analysis

The sample includes 24 journal articles, 6 articles published in conference minutes and 10 texts published on websites of a range of institutions. The number of the texts per type of publication are presented in Table 2.

Table 2  
Texts by type of publication

Type of publication	Study	Case study	Project discussion	Theoretical discussion	Framework discussion
N	17	7	6	5	5

Although the inclusion criteria allowed analysis of publications from 2000 until 2017, the databases search returned results only from 2003 onwards, with the majority of the texts being published in 2016 (30%), as it can be seen in Table 3.

Table 3  
Texts by year of publication

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
n	1	0	0	1	0	4	3	2	1	2	3	3	6	12	2

The texts give access to data published and derived from educational systems worldwide. Among the 14 countries appearing in the sample, the United States of America have the strongest presence, since the American educational system is the focus of 20 of the reviewed publications. Other than that, the countries represented in the sample more than once are Canada (4), Turkey (3), Australia (3) and Singapore (2). One text for each of Latvia, Italy, Nigeria, Denmark, Malaysia, United Kingdom, Israel, Brunei and Netherlands is analyzed whereas 2 of the texts refer to the whole of Europe.

## FINDINGS

### Research Question 1

The first stage of the analysis of the reviewed texts focused on the definition of the 21<sup>st</sup> century skills that the authors of the texts adopted as a basis for their discussion. In their great majority, the authors adopt definitions proposed by frameworks that are developed by the education or employment related institutions presented in Table 4.

Table 4  
Most cited 21<sup>st</sup> century skills frameworks.

<b>EnGauge 21<sup>st</sup> century skills (2003)</b>
Digital age literacy (basic, scientific, economic, technological, visual, information, multicultural literacy, global awareness), inventive thinking (adaptability, managing complexity, self-direction, curiosity, creativity, risk taking, higher-order thinking and sound reasoning), effective communication (teaming and collaboration, interpersonal skills, personal, social and civic responsibility, interactive communication), high productivity (prioritizing, planning and managing for results, effective use of real world tools, ability to produce relevant high quality products)
<b>OECD (DeSeCo) (2005)</b>
Using tools interactively (language, symbols, texts, knowledge, information, technology), interacting in heterogeneous groups (relate well to others, co-operate, work in teams, manage and resolve conflicts), acting autonomously (act within the big picture, form and conduct life plans and personal projects, defend and assert rights, interests, limits and needs)
<b>European Parliament and Council (2006)</b>
Communication in the mother tongue, communication in foreign languages, mathematical competence and basic competences in science and technology, digital competence, learning to learn, social and civic competences, sense of initiative and entrepreneurship, cultural awareness and expression.
<b>The P21 Framework for 21<sup>st</sup> Century Learning (2007)</b>
Learning and motivation skills: creativity, critical thinking, problem solving, communication, collaboration Information, Media and Technology Skills: information, media, communication and technology literacy

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Life and Career skills: flexibility, adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility

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**ATC21S (2012)**

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Ways of thinking (creativity and innovation, critical thinking, problem solving, decision making, metacognition), tools for working (information literacy, ICT literacy), ways of working (communication, collaboration) and ways of living in the world (local and global citizenship, life and career, personal and social responsibility, cultural awareness)

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**UNESCO (LMTF, 2013)**

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Physical well-being (physical health and hygiene, food and nutrition, physical activity, sexual health), social and emotional skills (social and community values, civic values, mental health and well-being), culture and the arts (creative arts, cultural knowledge, self and community identity), literacy and communication (oral fluency and comprehension, reading fluency and comprehension, receptive and expressive vocabulary, written expression and composition), learning approaches and cognition (persistence and attention, cooperation, autonomy, knowledge, comprehension, application, critical thinking), numeracy and mathematics (number concepts and operations, geometry and patterns, mathematics application), science and technology (scientific inquiry, life science, physical science, earth science, awareness and use of digital technology)

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As it can be seen in Table 4, each framework uses its own terminology and categorization of skills. However, even if named differently or approached from distinct perspectives, there are certain skills and competencies that are repeated throughout all frameworks. Studying the aforementioned frameworks comparatively resulted, thus, in the development of a compiled list that includes the skills valued by the cited authors and institutions, as is presented in Table 5.

Table 5

**Compiled 21<sup>st</sup> century skills list**

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creativity, divergent thinking, critical thinking, team working (especially in heterogeneous groups), work autonomy, developed cognitive and interpersonal skills, social and civic competences, responsible national and global citizenship, consciousness of interdependence, acceptance and understanding of diversity, recognition and development of personal attributes, interactive use of tools, communication in mother tongue and foreign languages, mathematical and science competence, digital competence, sense of initiative and entrepreneurship, accountability, leadership, cultural awareness and expression, physical well-being.

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**Research Question 2**

For the objectives of the discussion of this research question, the skills are categorized in four broad sets of skills, namely personal skills, interpersonal and social skills, knowledge and information management and digital literacy.

*Personal skills*

Creativity is one of the most discussed personal skills. Creative production of results is the target (Martin, Nacu & Pinkard, 2016). The notion is, often, discussed alongside the concepts of curiosity and imagination (Wagner, 2008; Abdullaha & Osmanb, 2010; Teruggi & Zuccoli, 2015), while Ejsing-Duun and Skovbjerg (2016), also associate it with playfulness. It is, further, related with the ability to innovate (Sheikh & Siti, 2016; Cruz & Orange, 2016). Romero, Usart, and Ott (2014) introduce the term “co-creativity” in the discussion of the skills of the current century, linking the concepts of creativity and collaboration, thus, giving a more collective dimension to the concept.

Another set of skills comes under the term “problem-solving”, the value of which is, especially, located in its application in authentic learning environments and the real world (Trinidad, Patel, Shear, Goh, Quek, & Tan, 2013; Heinrichs, 2016). Problem solving is related to analytical thinking as it requires the application of skills such as analysis and evaluation of evidence of whatever type, data, claims, beliefs and others, in order for the student to be able to provide solutions in the given challenges (Sheikh & Siti, 2016). Although conventional solutions are accepted, as long as effectiveness is achieved, the dimension of innovation is, also, valued (Cruz & Orange, 2016). Analyzing and evaluating accessed information is strongly related to critical and analytical thinking. Higher order thinking is considered as an essential skill for the citizens and employees of the 21<sup>st</sup> century (Alberta Education, 2006; Abdullaha & Osmanb, 2010) along with sound reasoning, inquiry and the ability to make informed decisions (American Association of School Librarians, 2007; West Virginia Department of Education, 2009).

The development of the self is approached through a discussion of the skills of self-management (Martin et al., 2016), self-organization (Romero, Lambropoulos & Birwatkar, 2015) and self-regulation (Trinidad et al., 2013; Fisser & Thijs, 2015). The significance of self-directional skills is emphasized (Alberta Education, 2006), while Romero et al. (2015) discuss self-reflection as a competence deemed essential for contemporary students. The ability to apply independent thought in everyday life situations of every type is discussed as a target skill in the position statement of the National Council of Teachers of English (2008). In addition, being capable of acting autonomously with the aim of forming and conducting life plans and personal projects, defending and asserting rights, interests, limits and needs is highlighted by Ananiadou and Claro (2009). Particularly focusing on the primary education context, Boyaci and Atalay (2016) highlight that for students’ achievements in educational and professional life, these skills should be experienced at a very early age.

Recognizing the ever-changing nature of the world, especially in the given global change accelerated conditions of the current century, authors engage in the discussion of skills that can help students fulfil their potential under the circumstances. Adaptability and agility are emphasized (Wagner, 2008) along with managing complexity and risk taking (Abdullaha & Osmanb, 2010). Finally, emotional intelligence is thoroughly discussed within the context of 21<sup>st</sup> century skills by Wilkens and Wilmore (2015).

#### *Social skills*

Communication skills are thoroughly discussed, sometimes in combination with collaboration skills and, often, located in the globalized environment of the 21<sup>st</sup> century. Skilled and effective oral and written communication is the target (Wagner, 2008; Trinidad et al., 2013; Teruggi & Zuccoli, 2015). Although the mother tongue is given priority (European Parliament, 2006), multilingual communication gains more significance as years pass and globalization is becoming more of an everyday reality (Heinrichs, 2016; Mercuri & Ramos, 2014). This condition further poses the need for the development of the team working skills required for one to be able to communicate and collaborate effectively and organically in heterogeneous environments, where

conflict management skills are, also, deemed essential (Ananiadou & Claro, 2009). Environments characterized by diversity are the new reality and developing the required open-mindedness that will allow one to work in them more smoothly and productively is a target (Heinrichs, 2016).

Global awareness is gaining more and more attention based on the recognition of the evolvement of the world as a global village where citizens are affected by issues of interdependence and is, thus, included in the discussion of the 21<sup>st</sup> century skills (West Virginia Department of Education, 2009). Cultural awareness and expression are seen as the first step (European Parliament, 2006) before reaching the level of being able to appreciate the value of varied cultures (Heinrichs, 2016) and construct intentional cross-cultural relationships and networks (National Council of Teachers of English, 2008). Leadership is, sometimes, included in the 21<sup>st</sup> century skills. Self-motivation and the ability to take initiative is regarded important (Wilkins & Wilmore, 2015) and discussed in combination with entrepreneurship and the ability to lead by influence (Wagner, 2008; Terrugi & Zuccoli, 2015).

#### *Knowledge and information management skills.*

The development of self-reflection and meta-cognition competencies are emphasized in literature as knowing how to learn is held to enhance learning results (Romero et al., 2015). Costes-Onishi and Caleon (2016) suggest that it is important for students to have the ability to assess their own weaknesses and to develop strategies for improvement. Balcaen (2008) discusses the concept of e-learning, which is becoming all the more common due to the evolution of technology and, thus, poses the need for the development of relevant skills that will make it an effective and meaningful process. Self-directed learning is another concept highlighted in research (Norris, Elliot, Chun Ming, Chee Kit & Akhlaq, 2013; Namson, Čakāne, France & Butkēviča, 2016), since the ability to learn independently is highly valued in the current professional and social conditions (Alberta Education, 2006). Trinidad et al. (2013), also, discuss the notion of knowledge construction. Martin et al. (2016) discuss the dimension of social learning, while Rich, Jones, Belikov, Yoshikawa and Perkins (2017), as well as Cruz and Orange (2016) highlight the need for collaborative learning skills. Since the 21<sup>st</sup> century is characterized by a high rate of change and, inevitably, a sense of insecurity at times, the ability to take intellectual risks is, also, valued (Allmond, 2016).

Information management skills are, often, discussed in relation with digital skills, treated by some authors as a distinct set of skills and by others as a set of sub-skills of digital literacy. The interactive trait of information literacy is highlighted (Ananiadou & Claro, 2009). Being able not only to access and analyze data, but also to manage multiple streams of simultaneous information is deemed of high significance, as it is the basis on which the student can develop his or her skills of applying knowledge to new situations and, ultimately, create new knowledge (National Council of Teachers of English, 2008; American Association of School Librarians, 2007). Content knowledge is, also, discussed in the reviewed publications (Balcaen, 2008), although not much emphasis is placed on it, compared to other skills and competencies.



*Digital literacy*

From the content analysis of the selected publications, it becomes clear that there is a clear emphasis on the digital feature of the 21<sup>st</sup> century. As a result, digital literacy ranks highest than all other skills in researchers and education stakeholders' interest. In fact, it is stated that the primary reason why 21st century skills differ from those of the previous century has to do with the emergence of advanced information and communication technologies (Dede, 2009; Shute & Becker, 2010, as cited in Boyaci & Atalay, 2016). A number of studies (Romero et al., 2015; Rich et al., 2017; Magen-Nagar & Peled, 2013; Henderson & Honan, 2008; Lohnes Watulak, Laster, Liu, & LERN, 2011), a literature review (Romero et al., 2015), an overview of evaluative standards (Sharp, 2014), and two project descriptions (Karakoyun & Kuzu, 2016; Jensen, Paige, Sweredoski, & Yanoff, E. 2010) have digital skills as their core focus, while almost all of the publications mention and discuss issues of digital literacy, in combination with the other 21<sup>st</sup> century skills.

In the discussion of digital literacy, which is the term mostly used by authors, a variety of sub-skills are discussed. Confidence in the use of media and ICT and proficiency in the use of digital tools are considered important (National Council of Teachers of English, 2008; Ofodu, 2012; Martin et al., 2016). It is, further, discussed that this relationship with the technology should be interactive (Ananiadou & Claro, 2009) with students developing the ability not only to access multimedia texts, but also to analyze, critique, evaluate and create new pieces of them, attending at the same time to ethical responsibilities, a topic also deemed important in such complex environments (National Council of Teachers of English, 2008). Lohnes Watulak et al. (2011), also, discuss the notion of a participatory culture in technology.

The 21<sup>st</sup> century skills discussed above as they are categorized under the aforementioned titles of personal skills, social skills, information and knowledge and digital literacy are synthetically presented in Table 6.

Table 6

The four categories of the discussed 21<sup>st</sup> century skills

<b>Personal skills</b>	<b>Social skills</b>
Self- development and autonomy (self-management, self-organization, self-regulation, self-direction, self-reflection, independent thought, autonomous acting, ability to form and conduct life plans and projects and to defend assert rights, emotional intelligence)	Communication- collaboration (skilled oral and written communication in the mother tongue and foreign languages, team-working especially in heterogeneous environments, open-mindedness, conflict management)
Creativity (curiosity, imagination, playfulness, creative production, co-creativity, innovation)	Cultural awareness, global awareness (ability to appreciate the value of the varied cultures and to intentionally construct cross cultural relationships and networks)
Problem-solving, critical thinking (in authentic learning environments, analytical thinking, analysis and evaluation of evidence, ability to provide solutions in given challenges, higher-order thinking, sound reasoning, informed decision-making, innovation)	Leadership (self-motivation, initiative taking, entrepreneurship, leading by
Presence in the globalized environment (adaptability,	

agility, managing complexity, risk-taking)	influence)
<b>Information and knowledge</b> Learning (self-reflection, self-assessment, self-improvement, meta-cognition, e-learning, self-directed learning, independent learning, knowledge construction, social and collaborative learning, intellectual risks) Information management (information literacy, data access and analysis, managing multiple streams of simultaneous information, applying knowledge to new situations, creating new knowledge, content knowledge)	<b>Digital literacy</b> Confidence in the use of media and ICT, proficiency in the use of digital tools, interactive digital skills, critical use of digital tools (analysis, critique, evaluation, creation), ability to attend to ethical responsibilities required in complex environments, participatory culture in technology

## DISCUSSION

The categorization presented in the findings section is hardly accurate and concrete as a number of the skills could equally be placed under one or more categories, depending on the interpretation of each term, which may depend on the context, the perspective or even the identity of the interpreter. As it has already been mentioned, the vagueness of the terminology adds to the complexity of the discussion of the 21<sup>st</sup> skills.

Further than that, the skills themselves are internally multi-aspect and multi-level concepts. Taking creativity as an example, although this might be placed in the personal skills category, there are certain aspects of it that surpass the lines, such as co-creativity. This is, especially, the case with the higher levels of all discussed skills and competencies. For instance, communication is discussed as an essential 21<sup>st</sup> century skill, but includes several levels, starting from communication in the mother tongue, to skilled communication in the mother tongue, multilingual and skilled multilingual communication, communication in heterogeneous environments, communication in digital environments, result-oriented communication, innovation-oriented communication, and others. In fact, what gives the skill of communication its 21<sup>st</sup> century dimension is its combination with dimensions of other skills and competencies from the other categories. Consequently, the four categories presented in Table 6 could only be divided or, better-said, linked by interrupted lines, providing a better visualization of their essentially intertwined character.

Furthermore, it becomes evident from the findings of the texts analysis that there are some issues that are transcendent, being treated as essential characteristics of the contemporary educational, social and economic context that determine the nature of the 21<sup>st</sup> century skills. It could be said that these refer, mainly, to the globalized character of the world, the evolution of technology and ICT and the need for innovation. New, emerging conditions posed by globalization give a certain dimension to each of the discussed skills and competencies. Educational stakeholders discuss the list of skills presented in the context of the particularities of an interdependent, heterogeneous, diverse, global environment. The discussion of skills such as team working and leadership, for example, is not a new thing in the education literature. What is new, however, is the fact that beyond being able to collaborate in teams or lead, the

contemporary student and future citizen and employee needs to be able to do so in environments characterized by the challenges posed by diversity.

The advances in the information and communication technology are, often, treated in literature as one of the main characteristics that differentiate the current century from the previous one. The information explosion triggered by the development of the ICT poses the need for higher order information management skills (Ananiadou & Claro, 2009). The skills and competencies categorized under the term digital literacy are, probably, the ones mostly discussed and analyzed in the reviewed publications. However, their presence in the discussion goes far beyond their concrete form to attributing a new dimension to all the skills and competencies analyzed. Information management and learning, for example, have, always, been internal parts of the educational procedures. They gain a new dimension, however, since the nature of information itself has changed, posing the challenge for more advanced skills of a critical approach and synthesis of the vast volume of available information that can be approached through a great number of channels, at times, even, simultaneously.

A final concept that, often, appears in the discussion of 21<sup>st</sup> century skills is that of innovation. The discussion of the multiple aspects and levels of the listed skills and competencies in the particular educational, social and professional context of the current century evolves on the basis of the underlying need for innovation. The development of the skills by the individual bears no essence if it is not aimed at the ultimate goal of innovative creation at any level and field. This dimension may be, mostly, emphasized when the topic is approached from the professional perspective, where there is a stronger attribute of result-orientation, but is not limited only to that.

#### **LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH**

The discussion of 21<sup>st</sup> century skills includes many distinct dimensions and can be approached through numerous perspectives, the professional world, the academia, national and international policies, practices at the school level and different education levels or educational structures among others. For reasons of resources and time constraints, the inclusion and exclusion criteria set for the current review resulted in the exclusion of the analysis of the whole range of perspectives, focusing only on the dimension of the 21<sup>st</sup> century skills in formal primary education. It is recognized, however, that analyzing an isolated dimension cannot result in a holistic study of the concept. For this reason, the findings presented are mostly treated as tendencies deriving from the literature, rather than as facts.

It is considered essential that the topic is further investigated with the inclusion of a wider range of its interrelated dimensions, which would give a more holistic and profound visualization of the complex concepts discussed. Possibly, the combined analysis of texts that approach the concept of 21<sup>st</sup> century skills from different perspectives would provide an enhanced representation of the variety of the aspects. Moreover, a comparative analysis would, probably, shed light to the variety of the interpretations of the same terms and the reasons for them.

Although the research questions of the current literature review refer specifically to the discussion of 21<sup>st</sup> century skills in the context of primary education, finding publications solely focusing on this education level proved a challenge, as, unfortunately, a very small number of texts focus on the discussion of 21<sup>st</sup> century skills in formal primary education. This poses the question of whether all skills can be or should be emphasized equally at each education level. This recognized research gap could be interesting to investigate in the future. As students' profiles change according to age, inevitably affecting the corresponding educational needs, structures, practice and goals, it would be interesting, as well as theoretically and practically valuable, to see in further detail and depth how the concept of the 21<sup>st</sup> century skills is, also, approached differently with respect to this condition.

### CONCLUSION

The discussion of 21<sup>st</sup> century skills in primary education in the current literature review attempted to go beyond the terminology used in skills frameworks cited by authors to their actual interpretation of the concepts. According to the findings, authors seem to visualize the 21<sup>st</sup> century as an era majorly characterized by the evolution of technology and ICT, globalization and a need for innovation, consequently highlighting the need for students to develop relevant skills and competencies. It remains a concern for the author, though, that special attention should be paid to the maintenance of an equilibrium between the personal and social needs of the individuals and their result-oriented skill development mostly related to professional achievement, especially in the context of the primary education.

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