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21ST CENTURY SKILLS AND DIGITAL SKILLS, ARE ONE AND THE SAME THING?

Helena Belchior Rocha[1], Rosário Mauritti[2,] João Paiva Monteiro[3] Luís Carneiro[3]

[1] ISCTE-Instituto Universitário de Lisboa; Centro de Investigação e Estudos de Sociologia (Portugal)

[2] ISCTE-Instituto Universitário de Lisboa, Centro de Investigação e Estudos de Sociologia (Portugal)

[3] ISCTE-Instituto Universitário de Lisboa; ISCTE Soft Skills Lab (Portugal)

Abstract

The need to prepare the next generation for the labour market and for new social contexts requires that higher education (ES) reorganizes its learning and training offers to reflect this growing demand. In order to do this, higher education institutions (HEIs) must face certain challenges in identifying and understanding the characteristics and needs of the new generation of students. Over the last few decades, reference models on transversal competences (soft skills) have been established, classifying them under these nomenclatures: instrumental, interpersonal and systemic. However, such classifications do not always consider the temporal and socioeconomic contexts of such references. With the aim of designing a more adequate offer of formative education, we have developed a study based on the systematization of the literature encompassing reference models, categorization and terminology of competences skills and aptitudes. Our study intends to analyses to what extent classification systems (at least in some cases) refer to equal, different or complementary competences in each one. An asymmetry remains evident between the needs for skills enabling full participation in the present digital society and the educational development that HEIs offer convergent with these same needs. Such an asymmetry not only exists at the professional level, but also affects the behavioral, emotional, social, and cultural capacities. Moreover, unlike digital skills, 21st century skills are not necessarily underpinned solely by digital technologies. If two decades ago the categorization terminology were limited to instrumental, interpersonal and systemic skills, the research in this area would have developed more detailed frameworks that do not separate 21st century skills from digital skills, but instead a more comprehensive set would have been established: foundational or fundamental, emancipatory and humanistic, social and emotional skills to learn, create and innovate, and artistic skills. In addition, the discussion focuses on students' abilities to acquire and develop these new skills in an academic and professional context while disregarding the teacher's capacities to conduct and integrate those skills in transversal and transdisciplinary approaches in teaching and learning.

Keywords: Higher and Further Education, 21st Century Skills, ICT Skills and Digital Literacy, Faculty Professional Development

1   INTRODUCTION

In recent decades, the development of academic and labour market skills has been a concern of education institutions, from secondary schools to higher education. If at first the target audience of the initiatives covered by these guidelines was students, today they are extended to teachers and other workers, as well as being part of lifelong training plans in companies and organisations. In some national contexts, the professional development of the worker is based on the planning of updating or reinforcing skills, as opposed to simply acquiring and applying knowledge.

The issue that is now facing education and training institutions is the necessary renewal of the educational paradigm centred on the individual and his or her academic and professional skills. Research in this field has established the requirement for students at all educational levels to develop theoretical, methodological, operative and relational skills that better respond to professional challenges. This orientation is now transversal to education systems all over the world [1].

At the same time, the need to improve the quality and relevance of the skills students acquire before leaving formal education has been widely acknowledged, both as a counterpoint to the lack of experience in the labour market and, above all, to the uncertainty and volatility of labour relations. Basic knowledge and skills are needed, but are no longer in themselves sufficient to meet current social and economic demands in a highly competitive global economy. In an increasingly digital world, in which professions based on functional skills are in decline, competence-oriented education is of particular relevance [2]. In addition, socio-constructivist perspectives also highlight the importance of competence development in a context of social learning, in which students are actively involved in meaningful real-life and life-long situations [3].

1.1 Problem and research question

In the context of the activity of our university and Soft Skills Lab, which structured its training offer of transversal and communication skills in foreign languages in 2013, we are currently faced with a very heterogeneous set of students, to whom we need to respond at the beginning of their academic career. Soft Skills Lab's training offer is focused either on skills for the labour market, or also on fundamental skills not acquired at previous school levels or needing to be consolidated, for progression in higher studies, such as technical or operative skills in scientific reporting, bibliographic research and information analysis, time management and organisation up to relational skills involving command of the English language, teamwork, conflict management, etc.

The definition of the portfolio of training offer is based on the reference frameworks most appropriate to the academic institutional context of students, teachers and researchers, as well as other workers who are fundamental to the proper functioning of the institution, both in intra and interdepartmental relations and organic units at internal level, and in the articulation of the institution with the surrounding environment.

In this renewal of the curricular offer of soft skills it is essential to ensure that teachers involved in the different programmes are equipped with the pedagogical and relational tools required, including the possibility of using digital means.

It is in this direction that we respond to the challenge of restructuring and innovating our training offer, based on the reference frameworks in this field, identifying overlaps and conceptual complementarities and curricular design in soft skills.

2 THEORETICAL FRAMEWORK

2.1 The difficulty in defining the concept of competence

The term 'competence' was originally used in the professional context in France in the 1970s to refer to characteristics that workers need, in addition to qualifications, to act effectively in a variety of work situations. In the 1980s, competence-based approaches began to be developed in several countries, especially in the context of vocational education and training programmes. Since then, the concept of skills-based education has been extended to general education.

One of the major difficulties in delimiting this concept stems from the diversity of terminology, identifying terms such as skills, capabilities, abilities, whose neologisms derived from the English language (skills, capabilities, abilities) and from research work in the field do not always facilitate their easy understanding.

However, the question is persistent: what are skills?

Competence can be defined as a complex combination of theoretical, methodological, operative and relational tools that promote and lead to effective and integrated human action over the world in a given field. To be competent means, to be able to apply effectively a combination of knowledge, skills and instruments to react successfully to a situation or solve a real world problem [5].

2.2 21st Century and Digital Skills

If the term competence is difficult to achieve or delimit conceptually when referring to 21st century competences and digital competences, the task is also made complex by the equal heterogeneity of terms such as key competences or basic competences, complementary and contextual competences, digital competences, digital literacy, e-competences, among others [6].

Recent work has established the concepts and relationships inherent to 21st century competences and digital competences. As mentioned [4], they report symbiotic concepts, which at the same time achieve a high range of other competences. However, if these concepts converge to an extensive set of competences, such a set does not contemplate an integrating digital dimension, the same authors point out that 21st century competences are not necessarily supported by technologies and the digital aspect is minimised.

From a different perspective, but equally relevant in this discussion, some authors [6] develop a theoretical analysis on the frameworks of reference, addressing the competences of the 21st century, with regard to their definition, implementation and evaluation.

The main conclusions of this work demonstrate the convergence of reference frameworks for a common set of 21st century skills, in which information technologies are fundamental. In particular, given that they are both: (a) a foundation for the need for skills in today's world; (b) a tool for the acquisition and assessment of skills in today's context. In summary, the analysis emphasises the nuclear position of the use of information and communication technologies in 21st century skills.

As we can see, this dichotomy between 21st century competences and digital competences does not seem to have a convergent and conceptually integrating perspective.

However, it is still under the assumption mentioned [6] that digital technologies are a support to the acquisition and assessment of 21st century competences, that we find a possible point of convergence between the two concepts: concerning the need to enhance this integration through transversal pedagogical practices, in which the teaching and learning processes mobilize in parallel aspects of both.

This need for a pedagogical bridge that can unite the margins of the two concepts is the structure that can allow the implementation of this set of skills and the effective transformation of teaching and learning into innovative and changing practices. This, assuming that innovation in education and training depends on three components: institutions, people and pedagogical practices [7]. The attention that is often still given to the positioning of 21st century competences in the study plan presents a complex and controversial issue in view of its application to teaching and learning processes, which include assessment processes other than traditional ones (assessment based on learning processes and competences). [8].

2.2.1 21st century skills

The concept of 21st century skills has been extensively researched over the past decade. Most research analyses and compares it across a diverse range of reference frameworks.

The definition of 21st century skills as "new skills" or as "skills for the new generations" [12] tends to refer them to characteristics that society requires of existing human potential, in particular as regards educational plans for young people who need to be trained today for future jobs and careers and for full and responsible citizenship. Researchers say that the term "21st century skills" - or "21st century skills" - translates an overall concept into the knowledge, skills and provisions that citizens need in order to contribute to the knowledge society [3] [9].

What is extremely relevant in the conclusions of these authors is that, given the ambiguity of terminology and definitions, it is essential to clarify them, particularly so that educational institutions can establish new and appropriate training pathways that include "skills for the new generations".

Other authors circumscribe "21st century skills" as the knowledge, skills and behaviours necessary to be competitive in the labour force and to be able to participate adequately in a diverse society, using new technologies and coping with rapidly changing work contexts [12]. More broadly, and always on the basis of systematic literature reviews, one of the most recent definitions of 21st century skills encompasses a wide range of skill sets and professional attributes, including: creativity, divergent thinking, critical thinking, teamwork (especially in heterogeneous groups), autonomy at work, developed cognitive and interpersonal skills, social and civic competences, responsible national and global citizenship, awareness 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 scientific competence, digital competence, a spirit of initiative and entrepreneurship, responsibility, leadership, cultural awareness and expression, physical well-being [6].

2.2.2 Digital skills

The conceptual definition of digital competences relates in a linear way to the use of digital technologies (high-tech). However, such a technology-led perspective is reductive and it is therefore important when defining competences supported by or related to digital technologies to distinguish competences in a process of digital literacy development, in the context of 21st century competences. In particular [10]:

a) information literacy, such as the ability to access information efficiently or optimally, with greater speed and/or less expenditure and also with effectiveness, achieving the objectives or goals set, for this by assessing information critically and competently and using it with precision and creativity;

b) digital literacy, focusing mainly on how to make effective and efficient use of digital technologies, highlighting the skills needed to function in a knowledge society. and highlighting the interaction between technology and society, as well as the importance of understanding the technological principles needed to solve complex problems and meet the challenges of a knowledge society;

c) technological literacy. which covers the technical skills related to the use of technology. This axis can also be conceptualized in a much broader way, such as the use of digital technology, communication tools, information literacy and/or networks to access, manage, integrate, evaluate and create information to function in a knowledge society

Digital competence therefore requires a good understanding and knowledge of the nature, role and opportunities created by digital technologies in everyday situations: in personal and social life as well as at work. Digital competence also implies an understanding of the potential linked to the use of digital tools to support creativity as well as innovation, and an awareness of the issues related to the validity and reliability of available information and the legal and ethical principles underlying its use.

Skills needed include: the ability to research, collect and process information and to use it critically and systematically, assessing its relevance and distinguishing real from virtual, while recognising the links between the two.

It is evident, especially in the days of a pandemic in which we live, that a 21st century competence, such as data science, subsists in the face of a set of skills and knowledge not only digital, but numeracy and critical and abstract thinking [8].

In this context, it is important to highlight the contexts in which the benchmarks are structured, some based on technological scenarios that tend to be based on simplified and mechanistic views of education and training, neglecting that the acquisition and development of skills is a complex human process. It is also necessary to emphasize that society is composed of digital and analogical dimensions, which are indissociable [5].

2.3   Related work

With the diversification of conceptual frameworks, it becomes increasingly clear that there is a need for a clarification of the theoretical issue here in order to allow a common understanding of the underlying analytical dimensions. As we have previously mentioned, terminological and conceptual ambiguity creates barriers to the way we teach and evaluate the development of 21st century skills.

Although not yet in a systematized way, we have identified a set of works that have been analysing the existing frameworks of reference.

One of the most significant works [1] has implemented a systematic literature review, supported by an approach called Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [13], searching systematically in articles that classify 21st-century digital skills. - The empirical corpus involves the analysis of the content of 75 articles.

The results identify the various concepts and terminologies used by topping the results in the term - 21st-century (or twenty-first) skills. The results then made it possible to identify two strands of organisation of the dimensions and associated categories: one that distinguishes the essential digital skills, the other the contextual digital skills. In the first strand, are included the essential dimensions linked to technical skills (which we can also designate as operative and relational skills) of information

management, communication collaboration, and theoretical and methodological skills of creativity, critical thinking, planning and problem solving. In the second axis, the contextual dimensions of skills are located, such as ethical awareness, cultural awareness, flexibility, self-regulation and lifelong learning.

The authors conclude that the demands of the labour market imply a proposal that includes the digital competences of the 21st century, i.e. the skills needed to participate in knowledge-based forms of work organisation, and guidance for lifelong learning.

A second study, of equal relevance [6], analyses and systematises literature on eight reference frameworks of 21st century competences, developed to support their curricular integration. This work highlights the consensus in these frameworks, in addition to establishing a coherence in the curricular intentions that integrate their teaching and learning.

However, this consistency is not clearly observable, due to the use of different grouping and categorization procedures, as well as differences in the terminology chosen, a problem already identified in the work mentioned above. According to the authors, this may generate confusion and ambiguity, making it difficult to implement the competences in reference. The conclusions also reveal the central role of digital technologies in the various frameworks. They are considered as an argument for the need for 21st century skills, and a tool that can support their acquisition and assessment.

2.3.1 Professional development for teaching 21st century skills

In the context of these studies and the reference frameworks analysed, it is also important to highlight the key role of teachers in implementing curricular innovations. Teachers' attitudes, beliefs, competences and practices are determining factors for making changes in teaching and learning.

The references to the essential role of teachers in the implementation of 21st century competences and the consequent need to support them can be found in the frameworks. The teaching of these competences poses many didactic and pedagogical challenges to teachers, in particular due to their transversal or transdisciplinary nature, and also implies the ability to use digital technologies to support learning. This implies the need to master various teaching/learning strategies or methodologies and assessment procedures [12]. Teachers are not simply expected to be facilitators in the acquisition of skills, but rather to hold some of these skills themselves.

3 METHODOLOGY

As in other studies already mentioned [4] [6], we have elected the method of literature review as a methodological approach, specifically the scoping review, as an appropriate method for the process of systematic review of the literature to be used, since it allows a rigorous survey of the literature in a manner adaptable to the nature of the works elected for analysis and the inclusion of analytical and development studies where the results / conclusions are not represented in numerical expressions [14].

4 FINDINGS

Based on the literature review, which conceptually delimits the concepts of 21st century skills and digital skills, it seems clear that these two concepts cannot be observed in isolation. Therefore, with regard to a process of categorizing soft skills in an academic context, and designing a formative offer, based on a transdisciplinary curriculum, it will always be necessary to consider the two concepts described.

One result identified, and which we can consider positive, is the fact that the reference frameworks of competences converge towards a common set of 21st century competences (namely: collaboration, communication, ICT literacy and social and/or cultural competences (including citizenship).

However, there is still a discussion, which needs to be developed, about key competences and their link to 21st century competences, which contributes to the complexity of their application in an academic context within curricula.

The reference frameworks also mention three challenges: the curricular integration of 21st century competences, the need for professional development in teaching and the involvement of actors from the sectors (public and private) as a critical factor for their implementation.

5 CONCLUSIONS

Competencies may be based on a given subject or be transversal in nature. In addition to national definitions and frameworks, there are a number of international competence frameworks in which different and comprehensive terminologies and concepts can be observed.

There is an extensive literature on 21st century skills in which there is a general consensus on the need for new forms of learning to meet global challenges. However, despite this consensus, there is no single conceptual approach to the definition of 21st century skills, and consequently several sources categorise a variety of skills as 21st Century Skills, which is not always correct and it should be ensured that the associated terminologies and definitions are clear and properly used.

Even in the immensity of the existing literature, the need is identified to analyse the contexts (academic, professional, geographic, political and cultural) in which reference frameworks for 21st century skills have been generated, and which should be considered to establish future skill needs for the labour market.

The literature analysed also recognises the capacity and potential of digital technologies to improve 21st century skills, mainly through tools to enhance communication skills, collaboration, critical analysis and creative use of information. However, it will be necessary to overcome barriers on the adoption of digital technologies in the academic context, due to some limitations of teachers in this area, promoting the professional development of teachers in educational technologies and how these can be enhanced in the teaching of competences.

There is also a need for governments and institutions to rethink their models of professional development, recognising that the skills acquired by a student are as important as knowledge, and that in terms of teaching, opportunities should be provided to incorporate teaching skills such as problem-solving development, collaboration, creativity and communication. Furthermore, these competences cannot be taught in isolation, but must be present in the curriculum as part of teaching practices.

For future work, it will be relevant to integrate these two concepts now explored, as well as the potential of digital technologies, for the development of skills such as creativity and capacity for innovation, reflection and problem solving (design thinkig).

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