Literacy(ies) and skills in times of digital education: exploring communication and interaction in digitally mediated learning worlds

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Abstract

This article seeks to explore the notions of literacy(ies) and competences in times of digital education. The aim of the study was to understand, from perspectives of experts, what literacy(ies) and competences are in digital teaching-learning contexts, how they are operationalised, which strategies can be used for their development, and what are the opportunities and challenges for their application in digital education. Through a qualitative approach, four experts were interviewed as privileged informants in their areas of expertise. The individuals interviewed are academics with extensive research in the areas of literacy(ies), digital and infocommunication skills and digital education. The interviews were conducted during the first quarter of 2023, as part of a larger ongoing study - digital and infocommunicational competences in virtual learning environments: practices in e-learning curricular units in Portuguese Higher Education. According to these experts, digital is largely responsible for the recent changes in the world, but the most important thing is not learning or teaching digital: it is developing citizens' skills or competences, exploring communication and interaction in digitally mediated learning worlds. This demands the mobilization of competences to search and exchange information, and to interact with another people in digital environments. This can help citizens become more confident, critical, and open-minded users of today's technologies.

Keywords: digital education; literacy; digital skills; information and communication competences

1 Introduction

As social agents, we have been absorbing a constant digital revolution in a hypermodern contemporary society assumed as light (Lipovetsky, 2016) and liquid (Bauman, 2001), incorporating its influences in all aspects of our lives. The constant transformation and relocation of social and learning spaces and times and new forms of presence, action, interaction and communication revolutionise social relations and teaching and education modes.

In this increasingly digital and convergence configuration (Castells, 2002; Jenkins, 2006), in which we coexist in environments that can no longer be divided between online and offline, but in *onlife* environments (Floridi, 2015), digital education assumes a central role with the assumption that, even in learning environments, a community and its members operate by the competences activated and the relationships they can establish with each other in networks.

It has become commonplace to assume that the Internet and the Information and Communication Technologies (ICT) are responsible for the latest and more significant changes worldwide. In the field of Education, much has been discussed and written about the issues inherent to access, use, appropriation, skills

and knowledge. However, learning or teaching digital competences does not seem to be the most crucial aspect. Instead, developing citizens' key skills or competences and exploring communication and interaction in digitally mediated learning environments takes precedence. To this end, it is crucial to question what literacy(ies) and competences are, how they are operationalised, which strategies can be used for their development, opportunities and challenges for their application in digital education and the role of higher education.

2 Theoretical Framework

2.1 Literacy(ies), competences and their evaluation and development processes

The most basic definition of literacy is the ability to read and write. However, this short is the basis of a much broader and more complex concept, volatile due to personal, socio-economic, educational, historical and cultural characteristics. In Portugal, in its earliest definition, the concept of literacy is undoubtedly close to that of alphabetisation, which confirms the historicity of both terms being used as synonyms until the 1980s/90s.

Briefly and pragmatically, the concept of alphabetisation refers to teaching and learning in the fields of reading, writing and arithmetic. The concept of literacy, on the other hand, refers to the ability to process information in its reading, writing and calculation aspects in various written formats (texts, documents, graphics), used daily by each of us at a social, professional, and personal level. Therefore, we may conclude that literacy focuses on using competences/skills, whereas alphabetisation refers to obtaining them (Benavente, 1996). In this sense, it is possible to assume a continuum of competences, and it is possible to work empirically to understand where each person is situated in relation to that continuum (Benavente, 1996; Ávila, 2008).

The European Union (EU) Reference Framework sets out eight key competences: Literacy competency; Multilingual competency; Mathematical competency and competency in science, technology and engineering; Digital competency; Personal, social and learning-to-learn competency; Citizenship competency; Entrepreneurship competency; Cultural awareness and expression competency (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2019). The importance of each of these competences is assumed to be equal. As Ávila states, "literacy is a fundamental basic competence for the adult population" (2008, p. 41), and it is articulated with other key competences, such as digital competences, which are "essential to being able to take advantage of these technologies" (idem, p. 117). Therefore, "Without literacy competence, not only is the learning of these technologies compromised, but the use that is made of them is seriously limited" (idem, p. 426).

Governments and policymakers are increasingly interested in assessing the competences of their populations in the challenges that modern knowledge-based society presents, as having high-level literacy skills is fundamental for success in school, work, and social or private life. At the international level, we can speak of three surveys related to assessing literacy in the adult population: the Adult Literacy and Lifeskills Survey - ALL (OECD/Statistics Canada, 2005), the International Adult Literacy Survey - IALS (OECD/Statistics Canada, 2000) and the International Assessment of Adult Competences - PIAAC programme (OECD, 2021).

More directly related to the Education and Training sector are the Programme for International Student Assessment - PISA (OECD, 2020), the Teaching and Learning International Survey - TALIS (OECD, 2019c), TIMSS – Trends in International Mathematics and Science Study (Mullis et al, 2021), the International Computer and Information Literacy Study - ICILS (Fraillon et al, 2020), and the PIRLS - Progress in International Reading Literacy Study (Reynolds et al, 2022). Studies such as Eurydice's Digital Education at School in Europe (2019) or, specifically in the Portuguese case, the OECD Review of Higher Education, Research and Innovation: Portugal

(2019b) are also relevant. The diversity and conceptual renewal of literacies and competences is visible in all these surveys and reports and the definitions issued by international organisations.

However, assessing and developing competences has brought out some critical views. The great challenge of the process of education for competences, as Figueiredo (2019, p.3) states, "is that these are not learned or taught in modular and watertight contexts, as if they were knowledge. The competences, understood in a sense stated above, only emerge in the experience of complex, interdisciplinary, and eminently social situations". The development of competences can only be achieved through the use of appropriate pedagogies, models of learning and social practices.

2.2 The focus on digital competences/skills

At the European level, the Digital Education Action Plan (2021-2027) defines the European Commission's vision for digital education along two axes: promoting the development of a highly effective digital education ecosystem and strengthening digital skills and competences for digital transformation. However, the data associated with the Plan is unequivocal: many low-income households do not have access to computers, and broadband internet access varies widely across the EU according to household income; more than 1 in 5 young people across the EU lack a basic level of digital skills; the OECD study TALIS (2019c) found that less than 40% of educators were comfortable using digital technologies for teaching; almost 60% of respondents to an open public consultation on the new action plan did not use distance and online learning before the Covid-19 pandemic crisis; respondents said that online learning resources and content need to be more relevant, interactive and easy to use; and over 60% of respondents believe they improved their digital skills during the pandemic crisis, and over 50% want to continue to do so.

The results of the 2022 Digital Economy and Society Index (DESI), which tracks the progress made in EU Member States in digital transformation, reveal that Member States have been advancing in their digitalisation efforts but still struggle to close the gaps in digital skills. Portugal ranks 15th among the 27 EU Member States, having risen one position in relation to 2021. In the sub-domain that measures the level of the population living in Portugal (16-74 years old) with basic digital skills, it rose to 55.3%, 2.3 pp above the number found in 2021, and 1.4 pp above the EU average of 53.9%, also corresponding to the 14th place in the table.

On another note, even though the Portuguese education system has shown significant improvements in reading, mathematics, and science since the first edition of PISA, the latest data (OECD, 2020) show that Portugal appears in the 20th place on the list in all three areas assessed, revealing that Portuguese students worsened in reading (one in five students cannot identify the main idea of a text) and in science and did not evolve in mathematics. On issues more directly related to technology and the Internet the results reveal great disparities between countries, and within countries themselves, in the availability of technology in schools and the ability of teachers to exploit ICT effectively. The report shows that only 32% of students in Portugal attended schools where Internet speed could be considered "sufficient", well below the OECD average, which was then 67.5%, just as only 15% of computers in schools were laptops. When asked about the existence of effective e-learning platforms, only 35% of Portuguese school directors responded positively. In contrast, over half of OECD directors said they already had this resource.

Data from the International Computer and Information Literacy Study (IEA, 2020), a study in which Portugal participated for the first time in 2018, reveals that most eighth-graders cannot use the computer autonomously and need guidance to perform basic tasks. ICT is mainly used outside the school and for activities unrelated to school. In terms of constraints, they highlight the lack of efficient computers and insufficient bandwidth or speed. The ICILS studies (2013 and 2018) highlight that being born into a digital world does not necessarily

mean that someone is digitally competent. The findings of the first two ICILS cycles indicate that young people have not developed sophisticated digital skills or aptitudes, only registering growth in the use of digital devices.

Currently, in Portugal, the highlight goes to the initiatives carried out under INCoDe.2030 (a national programme that aims to empower the Portuguese population in digital skills) and the Digital Competence Dynamic Reference Framework (QDRCD) launched in 2017. The QDRCD is an instrument to assess the digital skills of the Portuguese population based on DigComp and presents three main objectives: to support the definition of policies and strategies; to design education programmes; and to assess and certify skills, either by self-diagnosis or by certifying entities. In the Portuguese framework, digital competence is understood as "the set of knowledge, skills, abilities, strategies, and attitudes needed to use digital technologies and media" (QDRCD, 2017, p. 15). All these initiatives seem to be in line with the warning issued by researchers such as António Dias Figueiredo, who problematises the extinction of the analogical for the insertion of the digital and ratifies the importance of the "systemic conciliation" between the two spheres, contrary to what he claims has been happening of an "obsessive preference for the digital".

2.3 Digital Education and the Role of Higher Education

We can use the expression digital education to highlight two different but complementary perspectives: the development of digital competences relevant to learners and teachers on the one hand and the pedagogical use of digital technologies to support, improve and transform learning and teaching on the other (Eurydice, 2019). In the European Commission 2018 Digital Education Action Plan, this is phrased as how education and training systems can better use innovation and digital technology and support the development of the digital competences needed for life and work in an age of rapid digital change.

Digital education is, therefore, one of the important aspects of the teaching and learning process. Digital education in the broader perspective of Online Learning, Blended Learning, Virtual Education, ICT-based education, etc. Higher education is a central venue for creating new knowledge economies for the 21st century (Sam & Van Der Sijde, 2014), and digital technologies are key means for realising this potential (Selwyn, 2016).

This "new" university finds its ideal space in the virtual world with the integration of digital technologies in the teaching/learning process. The social and technological evolution is thus reflected in the educational systems and justifies the virtual and digital growth in Higher Education Institutions (HEI). eLearning, online education, digital education, digital platforms and digital social networks are just some of the concepts used. These virtual learning environments take the form of true online learning social networks and learning and practice communities (Goulão, 2012), where students and teachers transform the teaching-learning process based on constant interaction. These vital info communicative and digital competences present in these networked digital learning ecosystems (Wilkinson, 2002; Caeiro & Moreira, 2019) can and should be analysed and strengthened, and assumed as key competences in mediated learning worlds.

3 Methods

3.1 Research objectives

The general objective of the study was to understand, from some experts, what literacy(ies) and competences are in digital teaching-learning contexts. The main research problem was: what is currently meant by literacy, competences/skills and digital education, especially for those in higher education. This problem included the following specific research questions: how literacy and competences/skills are operationalised, which strategies can be used for their development, opportunities and challenges for their application in digital education, and what is the role of Higher Education. By showing the point of view of these experts, it is possible to understand

what has been worked on and researched on literacy, competences/skills and digital education, especially in Portugal.

3.2 Research tool

Through a qualitative approach and using direct assessment methodologies, four experts were interviewed as privileged informants in their areas of expertise. The semi-structured interview technique was employed, characterised by a compromise between the previously established protocol of five questions and some spontaneity and improvisation. The tool included the following questions:

- What is digital education today?;
- What is meant by literacy and competences/skills?
- Is there currently a focus on digital competences/skills?
- How can we assess and develop these competences?
- What are the challenges and opportunities for Higher Education in these areas?

3.3 Research procedure

The interviews were conducted during the first quarter of 2023, as part of a larger ongoing PhD research - digital and info communicational competences in virtual learning environments: practices in e-learning curricular units in Portuguese Higher Education. All interviews were conducted by Zoom Colibri (a web collaboration environment that provides tools for conducting classes, meetings or work groups), in individual sessions of approximately one hour.

3.4 Sampling and characteristics of the respondents

The sampling was intentional. The respondents had to meet several criteria: being experts in the fields concerned, being recognised by other researchers and practitioners, and being available to share their views within the framework of doctoral research. In this way, four in-depth expert interviews were performed.

Respondent 1 (R1): Male, retired Full Professor from a Department of Computer Engineering in Portugal, where his scientific activity is devoted to the Social Dimension of Information Systems, Technologies and Innovation in Education, Strategy and Quality in Higher Education, History and Philosophy of Engineering and Projective Methods for Scientific Research.

Respondent 2 (R2): Female, Permanent Professor of the Graduate Program in Information Science in Brazil. She researches and has publications in Information and Communication fields, emphasising info communicational competences and the social participation of individuals and organisations.

Respondent 3 (R3): Male, Coordinating Professor at a School of Education in Portugal, and integrated member of inED - Centre for Research and Innovation in Education. He is linked to the coordination of the Portuguese project group of the Programme for the International Assessment of Adult Competences (PIAAC). He works in the area of Social Sciences with an emphasis on Education Sciences.

Respondent 4 (R4): Female, has a professional career of over 25 years, most of which in the context of the Information Society and development of digital projects in the private and public sectors. She is currently linked to the coordination of the National Digital Skills Initiative e.2030, Portugal INCoDe.2030.

3.5 Ethics

The research project this article is based on is in line with the Ethical Charter published by the Portuguese Society of Education Sciences (SPCE, 2020) and follows its guidelines. Mainardes e Carvalho (2020) argued that the investigative process was always associated with high levels of vigilance and self-reflection regarding

ethical issues. The participants have been fully informed about the purpose of the study, and have agreed to the recording of the interviews and to the way their content will be used. They also gave their consent for the publication of the research.

4 Results and discussion

4.1 Literacy(ies), competences and the evaluation and development processes

The interviewees present similar positions regarding the concepts of literacy(ies) and competences. They all share the view that there is currently some confusion and even exploitation of these concepts. The argument of R3 summarises the views of the four interviewees:

For me, it is important to underline what is essential about the concept of competence, which concerns a disposition for action that is supported by knowledge, attitudes, and values... (...) Because it emphasizes the action of individuals, on the most internal dispositions and, as far as training and education are concerned, it reinforces the functionality of knowledge without calling into question the importance of this knowledge. I see immense advantages in using this concept in education systems for children, young people, and adults. In relation to the concept of literacy, I consider that it runs serious risks, the greatest of which is that its use has spread to applications which are far from the essence of the concept. When a concept starts to be used in excessive circumstances, it loses its theoretical usefulness, it ceases to be useful. I am, therefore very resistant to the use of this concept in areas such as emotional literacy or digital literacy. What I think is that there is a set of skills, some of them essential (such as digital ones). I think there are more important advantages in circumscribing the concept of literacy to skills related to the ability to use reading and writing, also using digital environments. (R3)

The responses are demonstrative of a theoretical framework associated with these fields: competences are defined as a combination of knowledge, skills and attitudes, where: a) knowledge is composed of the facts and figures, concepts, ideas and theories which are already established and support the understanding of a specific area or subject; b) skills are defined as the ability and capacity to carry out processes and use the existing knowledge to achieve results; c) attitudes describe the disposition and mindsets to act or react to ideas, persons or situations. Key competences are those that all individuals need for personal fulfilment and development, employability, social inclusion, sustainable lifestyle, prosperous life in peaceful societies, health-conscious life management and active citizenship (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2019).

Competence is understood as the convergence of knowledge, skills and attitudes. Every time I work with competences, I am not only working from the perspective of knowledge or skills. It implies knowledge, and skills but also attitudes. (R2)

However, when it comes to the assessment and competence development strands, views become more critical:

It is not possible to assess competences if we do not have benchmarks for these competences, and the more this assessment is contextual in the everyday practices in which people develop their social practices, the more interesting this assessment exercise will be. However, this ideal technique is not feasible in extensive studies of competences. Therefore, it is necessary to find methodological solutions that allow for such an assessment. If we accept that competences are a disposition for action, we will always be making an indirect assessment of these competences, always in their manifestations. We have to create challenges that correspond to predictable situations of everyday life. (R3)

Making a difference today between education and digital education or between literacy and digital literacy no longer makes much sense because, in order to have literacy, you must necessarily have digital literacy. And the same scenario is valid for Education, which nowadays is necessary and also through digital literacy. I believe that in a short time we will no longer say digital literacy; we will just say literacy, (...). Having said that, I also believe that those with a higher level of digital literacy are the ones who are more literate. (R4).

4.2 The focus on digital competences/skills

As mentioned, there is an increasing interest in understanding, assessing and training digital competences. This situation sparks a debate: Do digital competences play a central role? Are non-digital competences going to continue to be useful? How are the two types of competences going to coexist?

Literacies today and the competences for those literacies should be literacies of everything. This tendency to focus everything on digital literacy and the respective skills is silly. And I believe that you cannot measure skills. You can, however, assess because we are in a qualitative domain. (R1)

In terms of digital skills, we have a huge lack of intermediate skills in Portugal [there are basic, intermediate, advanced and specialised skills]. We have made a huge advance. We started in 2017 with 22% of digitally excluded people, and, at this moment, we calculate that the numbers should be around 12%. And even that 12% corresponds to people considered digitally excluded but who even have a mobile phone and know, for example, how to send messages. They are no longer in such a situation of blatant exclusion as they were a few years ago. However, these people do not have the necessary skills to, for example, make an informed search, know how to distinguish a false news story from a true one, to have the basic rules of cybersecurity, and they end up being generators of content in a way they don't know they are being. Portugal still has a long way to go, even among higher education students. (R4)

The biggest difficulty in promoting digital skills is the failure in literacy skills. The promotion of these skills cannot be dissociated. Being certain that to put digital skills into practice, we have to master all the other essential competences. (R3)

These answers from the interviewees seem to be in line with the most recent findings: results from the Survey of Adult Skills (OECD, 2019) show that low-skilled adults comprise a significant share of the population in all participating countries and economies. On average, across the OECD countries participating in the survey, close to one-fifth of adults perform at or below Level 1 in literacy and numeracy. In some countries, over half of the adults score at or below these levels. Around one-quarter of adults in all participating countries have no or only limited experience with computers or lack confidence in their ability to use computers. In addition, nearly one in two adults are only proficient at or below Level 1 in problem-solving in technology-rich environments. According to PISA data (2018), low performance remains a challenge in Europe. Several measures have been taken to promote basic competences: standardised national tests, national reports on performance, use of student performance in the assessment of schools, initial teacher training, and additional resources for schools with a high number of disadvantaged students.

4.3 Digital Education and the Role of Higher Education

It is necessary that education, and higher education in particular, keeps up with pedagogical and technological developments in order to qualify and instruct people with the necessary knowledge to understand science and make their professional, personal and political choices. This means talking about Digital Education.

I have a very controversial idea about digital education. There is not digital education nor analogical education. There is only one education, which is education for life. And that education does not serve to provide knowledge in a very positivist and mechanistic view. What education can and should provide is autonomy for each student,

a future citizen, to build his destiny and the destiny of each one of us. Obviously, to do so, you have to obtain knowledge and skills, but education goes beyond that. Education builds autonomy. (R1)

The difference between decades, courses and audiences is also listed in the answers, as well as the challenges in this field:

In Higher Education today, we have more qualified and skilled young people, both in terms of generation and age groups. However, it is increasingly difficult to talk about Higher Education students in general because the internal disparities within this group are striking: the skills or difficulties of students from one course may be quite different from those of another course, for example. And we are also witnessing the continuation of the knowledge accumulation model, with the logic of tests/exams at the end, which leads to the poor development of various skills. (R3)

One of the great challenges of Higher Education, and as far as digital education is concerned, is to empower students with the necessary skills to, through the critical use of technological artefacts and tools, (become) informed and communicate in virtual learning environments. (R2)

Students need to have particular skills that are not specific to technological degrees. There is some approximation, in common sense, between digital and technological courses, but it is not real. Nowadays, digital must be present in all degrees, and in all training. And it is very important to investigate and work on these issues because the results are essential for adequate public policies in these fields. (R4)

5 Conclusion

The evolution of digital technologies and society itself dictates new demands for each of us. The illusory sense of a certain mastery of digital media is no guarantee that we are part of a digital education scenario. To be properly integrated into society in an informed way, we need to develop information-processing skills in reading, writing and arithmetic (literacy competence) and in all other competences. Reading and writing nowadays require increased skills, which derive from the speed, dispersion, interconnection and volatility of information in digital environments.

It is not a matter of remaining today in doubt as to whether we are talking about literacy or literacies (plural, multiple). But it is about assuming that we are in the presence of competences; literacy itself is one of the essential competences (in line with what the European Commission recommends).

The digital education outcomes are linked with the fundamental inequalities that prevent participation in digital learning. Similarly, collaboration, arguably the emergent and untapped outcome of digital education, is also dependent on all essential competences and not only on digital competences, or lack thereof, among all university stakeholders. This is because Higher Education has a decisive role in this field as a centre for advanced training of 21st-century citizens.

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