



Experts' views on digital competence: Commonalities and differences



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ABSTRACT

Following earlier studies aimed at gaining a deeper understanding of digital competence through a review of literature and current digital competence frameworks, this paper focuses on experts' views on digital competence. It describes the results of a Delphi study investigating experts' ideas on what it means to be digitally competent today. The study involved two online consultations, one directed at gathering individual ideas and one directed at validating the aggregated mapping of digital competence, established through various qualitative and quantitative data analysis steps. The paper describes and discusses the final results from the Delphi study involving 95 experts from across Europe and beyond. Results indicate that digital competence is built up of knowledge, skills, and attitudes pertaining to twelve different areas. Besides, results show that several issues of debate can be identified when it comes to establishing the boundaries of digital competence.

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1. Introduction

Without wanting to claim predominance of technology in the world today (Lanier, 2011), we do believe that few will dispute that digital technologies play an important role in present-day life. As do, by effect, the knowledge, skills, and attitudes that are required to deploy these technologies. Digital competence is one of the Eight Key Competences for Lifelong Learning as described by the European Parliament and the Council, and is defined as: the confident and critical use of Information Society Technology (IST) for work, leisure, and communication (European Community, 2007). This very brief definition of digital competence already reveals that digital competence relates to many aspects of life (work, leisure, communication) and is considered to stretch beyond mere know-how and technical skills, for it refers to confidence and a critical attitude as well.

What it means to be digitally competent in more practical terms though, is less evident. Some common ground exists at a general level in that competences can be described in terms of knowledge, skills, and attitudes, which may be hierarchically organised (Cheetham & Chivers, 2005). However, with respect to digital competence, actual elaborations vary depending on the context and the particular 'language' used, e.g. digital literacy, e-skills, information literacy, media literacy (Ala-Mutka, 2011), resulting in a 'jargon jungle' (Ferrari, Punie & Redecker, 2012). An analysis of current frameworks for the development of digital competence revealed that while several current frameworks tend to focus on technical operations, many are moving in a direction where they take into account higher order thinking skills in line with the 21-century skills perspective (Ferrari, 2012, pp. 1–91). It can be argued that there is a need to converge broad conceptual and narrow operational definitions on the one hand and digital and general competence on the other hand (Ala-Mutka, 2011; Ferrari et al., 2012).

All in all, current research and practice in the field of digital competence, reveals a scattered image, that fails to provide the transparency needed by teachers, employers, and citizens, i.e. all those who are responsible for digital competence development - be it their own or other people's. The transparency needed to make informed decisions, that is. In order to enhance understanding across the worlds of research, education, training, and policy a common language is needed. This will make it easier for citizens and employers to see what digital competence entails and how it is relevant to their jobs and lives more generally. To this end the present study brings together the opinions of experts of digital competence representing a range of fields, to establish which knowledge, skills, and attitudes 'add up' to define digital

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competence. The experts who took part in the study were asked to generate ideas on what it means to be digitally competent taking in mind various profiles: children, adolescents, senior citizens. The study was commissioned by the European Commission's Joint Research Centre (Institute of Prospective Technological Studies – IPTS) as part of the wider Digital Competence Project, launched in 2010. The aim of the study was to collect the opinions of stakeholders on what they believed to be the salient and current aspects of digital competence, given the multi-faceted and over-changing nature of the concept. We used the Delphi method to first collect ideas from the experts individually and then present the aggregated, collective result back to them for further comments and refinement. Section 2 provides the state-of-the-art on the current debate on digital competence. Section 3 describes the method in more detail. Section 4 reports the results from the experts' consultation. Finally, conclusions are drawn and implications discussed in Section 5.

2. Digital competence: a debated field

Any attempt to define Digital Competence implies taking a position in theoretical, semantic and lexical terms. The very name to be given to the concept is far from being uncontroversial. A number of relevant international authors refer to 'Digital Literacy' (Bawden, 2001; Belshaw, 2012; Eshet-Alkalai, 2004), while in the Scandinavian context the term 'Digital Competence' is preferred (Krumsvik, 2008). In this paper the notion of 'Digital competence' was chosen for two main reasons. Primarily, digital literacy is more often used in the European initiatives and policy context when making reference to inclusion dynamics (European Commission, 2010), while digital competence is more often employed as a broader and educational oriented concept (European Parliament and the Council, 2006). Additionally, the term competence refers to the categorisation of a discipline in a series of intertwined knowledge, skills and attitudes, the three learning domains envisaged by Bloom (1956). Therefore, a discussion on competence rather than literacy brings the focus on its wider educational conceptualisation on the one hand and on its constituting elements on the other.

The debate on defining digital competence, or literacy, started as early as the 90s, when several authors used it to refer to the ability to read hyperlinked texts and explore multimedia formats (Bawden, 2001). The first influential definition was given in 1997 by Gilster, who took a broader approach in defining it as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (Gilster, 1997).² However, the fact that Gilster did not provide a set of competences, as well as the fact that digital literacy can be seen as having its roots on other related literacies as computer and information literacy, kindled a debate that rolls on into our days. While some academics refer to the ability to use technologies as computer literacy (Simonson, Maurer, Montag-Torardi, & Whitaker, 1987), others take the side of information literacy (Behrens, 1994), or promote the predominance of media literacy (Christ & Potter, 1998), or internet literacy, and so on and so forth. New terms have been created spreading from 'new literacies' (Coiro, Knobel, Lankshear, & Leu, 2008) to 'multimodality' (Kress, 2010). The origin of the debate and Gilster's influential book can be rooted in a decade of paradigmatic change on the use and adoption of technologies. Until the 80s, technologies, and computers in particular, were the tools of a minority of professionals (Leahy & Dolan, 2010). From the 90s, with the shift from programming languages to graphical user interfaces, technologies became more available to society (Erstad, 2010). At the same time, there was a change in the type of knowledge that was needed to use them, as it was no more necessary to be able to programme and code but to operate specific applications. Technological shifts and the spill over effects on the related competence change they entail can be seen as a spiral of unknown end. Technologies keep becoming user-friendlier, and therefore more pervasive, and therefore more needed than ever before. Technological changes bring about renewed sets of competences, as in the case of Web2.0 uptake, its implications on citizen's privacy, and the need to know how to protect one's privacy. The upsurge of new tools – or practices – seems to be likely to constantly require a reshaping of users' competences, as new literacies are deictic – which is to say they change regularly (Leu, 2000). Competence acquisition in a digital era has been defined from earlier on as a 'mind set' (Gilster, 1997), enabling the user to adapt to new requirements set by the evolving technologies (Coiro et al., 2008). However, there is a tendency to promote, develop, and assess a certain notion of digital competence that does not necessarily take into account the evolving nature of technologies nor the new requirements necessary to use and benefit from these technologies (Ferrari, 2012, pp. 1–91; NCCA, 2004). In 2004, the department of education of Ireland reported that many approaches to digital competence did not take into account higher order thinking skills (NCCA, 2004). A more recent analysis suggest that while approaches tend to include critical and thinking competences, the main focus still remains on operational, application-oriented skills (Ferrari, 2012, pp. 1–91). If 50 years ago technologies were for a professional and specialised few, and the shift from programming languages to mass certification schemes was made, now there is a need to make a new shift to promote and grasp the 'reflective skills' (Erstad, 2010) that are needed for taking advantage of the current technology use. Moreover, there is a need to forecast how the 'domestication' of technologies (Silverstone & Hirsch, 1992) is creating new practices that establish a new competence package. How are these practices evolving? What is the knowledge needed to face this evolution? What are the skills, knowledge, and attitudes that enable the current and common use of new tools? What is the mind-set that promotes the 'domestication' of the current technological pervasion?

In order to further enrich the debate, experts in different aspects of digital competence were asked to contribute to this study and to provide their opinion on the definition of digital competence. Or rather the *conceptualisation* of digital competence, as the above review of literature suggests that what might be needed is a pluralistic understanding of digital competence, similar to what Solove (2007) proposes in relation to the concept of privacy. In this he draws on the work of Wittgenstein who has argued that some concepts represent "a complicated network of similarities overlapping and crisscrossing" (Wittgenstein as cited in Solove (2007, p. 756)). Like privacy, digital competence may not be "reducible to a singular essence". The Delphi study we carried out to capture digital competence as perceived by experts, should help to gain a clearer insight in the concept as well as its constituent components.

3. Method

A Delphi survey, including both online and face-to-face consultations, was applied to facilitate a group of experts to first individually provide input to a mapping of digital competence and then validate (comment on) the collective result. This feedback process not only allows participants to reassess and modify their initial judgments, but also to review and assess inputs provided by other panellists, which is

² Certainly nowadays one would speak about technologies and not limit the definition to the use of computers.

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