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Digital Competencies and Capabilities. Pre-adolescents Inside and Outside School

Ida Cortoni[*]

Abstract: The investment on key-competences in last years was one crucial European strategy to face the new challenges of the knowledge society and of the digital convergence and to guarantee the active citizenship and social inclusion. The first answer has been given in Lisbon 2000's, when eight main objectives have been presented; they were focused on the improvement of skills in educational paths of the main agencies (i.e. school and family). Hence, the digital competence, included in Lisbon strategies, can be interpreted in a double meaning: as basic skill (focused on the digital literacy) as soft skill (focused on the digital learning). Starting from here, this proposal will construct a theoretical description of the digital competency and its impact to socialization processes of pre-adolescents, considering the influence and the strategies applied by agencies of the social capital. This issue will be analysed through the re-reading the *capabilities approach* by Sen and Nussbaum (2011), according two perspectives: 1. the first is connected to the development of digital competencies during the learning process of preadolescents; 2. the second is focused on the relational and communicative styles of their socializing agencies, that influence the relationship of children with media, with social and cognitive consequences.

Keywords: digital education, digital competency, capability, social capital

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Introduction

The article proposes some reflections on the links between digital competencies and the social capital of families and schools, which emerged in the course of research carried out by the Minors' Mediamonitor Observatory at the Sapienza University of Rome's Department of Communications and Social Research (www.mediamonitorminori.it).

The innovative nature of the reflection and the adoption of the "capabilities" approach elaborated by Sen (1999) and later by Nussbaum (2010), are used to analyze the relationship between digital competencies and social capital. This approach does not merely focus on the availability of resources for developing capabilities, but also on the agencies' readiness in activating children's "fundamental" capabilities, thus allowing them to acquire competencies. There is, therefore, a transition from *an approach based on resources* to *an approach focused on the effective capabilities of children* in using these resources, giving rise to social behavior patterns (the so-called Sen "functionalities").

This article has two specific objectives:

1. To contextualize the capabilities approach within a conceptual scheme focused on the key words: social capital and digital competencies.
2. To illustrate the results of the pilot survey regarding the types and levels of influence family social capital exerts on the media consumption styles and development of pre-teens' digital capabilities[1].

From capabilities to competencies

By the term "capability", A. Sen indicated a subject's "possibilities of functioning", i.e. what a person can do, which need to be coupled with the capabilities in functioning in order to be transformed into concrete behavior. In this way, the definition of "capability" is strictly related to that

[1] In order to analyze the competencies which develop during socialization, we considered teens aged 12-14 as our unit of analysis, as they have reached a level of maturity of Competencies capable of valid empirical analysis (Piaget, 1969; Vygotkij, 1934). The *learning outcomes* obtained through such empirical analysis may be interesting indicators of different developmental processes.

of "functioning", that is to provide well-being and happiness in that way every social actor means.

Nussbaum follows up on Sen's reflections and deepens the concept of "capability", articulating it in three subtypes:

1. Basic capabilities;
2. Internal capabilities;
3. Combined capabilities.

The basic capabilities are strictly related and hypothetically influenced by the socio-cultural context. For example, in the case of children, this is the family and school context in which they grow up and which provides them with opportunities for developing modalities of interpretation and social behavior within the social reality.

In other words, according to Nussbaum, fundamental capabilities represent only the equipment that individuals are born with or *the necessary (but insufficient) basis for developing more advanced capabilities*.

Internal capabilities are the abilities, mental and physical states, "traits of the intellect, character and body" (Nussbaum, 2003, p. 59) and represent the basic propensities and aptitudes of a subject's personality.

These are to be found in the zone of proximal development (Vygotskji, 1934) and evolve into behaviour patterns, thus changing from the power into the action thanks to the external sociocultural solicitations traceable to the levels of social capital. In this sense, they allow the person to develop culturally and professionally and to find his or her feet in the social, civil and professional world.

Lastly, *combined capabilities* are a combination of internal capabilities and socio-relational circumstances – conditions, external opportunities (and circumstances) favorable in putting into practice these capabilities.

The social capital of the family and the school can have a profound impact on the children's possibility of "becoming people" (Vygotskji, 1934) and on the transformation of Nussbaum's so-called "internal capabilities" into combined capabilities. In this way, children can acquire the effective capability of realizing their rights, having a good life, developing competencies that they can use as adults, as well and becoming active citizens who are fully integrated into the future socio-cultural context.

The influence exerted by social capital on these capabilities is twofold: from a macro-perspective, as socio-cultural humus attributable to the geographical and historical context, an indicator of the subject's social

background status, while from a meso-viewpoint, through the impact of the social circles (or networks) mediating the socialization processes.

The *combined capabilities* are at the basis of the development of the so-called *soft skills*, that are different from *hard skills* (or notional competency or knowledge) and facilitate the social inclusion of the subject and the expression of the rights of active citizenship (Spencer & Spencer, 1993; Boyatzis, 1982, Goleman, 2007; Golemon, Boyatzis & McKee, 2004). The latter refer to a wide range of individual abilities relative to the processes of knowledge: behaviour patterns in social and professional contexts, the ability to reflect and the methods adopted, the use of learning strategies and the self-correction of one's conduct.

Digital capabilities

In the school 2.0 it is essential to analyze what then are the elements connecting digital competency and the system of capabilities. Firstly, in the era of media convergence (Jenkins, 2006), technologies can be included among the basic functions which Sen talks of (or in the cultural capital of Bourdieu – Paino & Renzulli, 2016), which are at the basis of a better quality of life and the measurement of an individual's level and condition of social and cultural wellbeing. Technologies are, in fact, material and symbolic goods which are part of the set of available external resources which a subject can use during the process of socialization. Nussbaum's *basic technological capabilities,* which represent the so-called entry-level skills and correspond to the basic technological and linguistic literacy which subjects need to acquire in order to exert their citizenship rights in information, choice and orientation.

We are talking here about notional and procedural competencies related to *digital literacy* (Gilster, 1997; European Parlament, 2008). These competencies often mature at an informal level and through experience, and are therefore a part of informal knowledge, learnt by imitation and trial and error (such ad a 2-3 year old child in front of the TV).

The possession of notions and basic technological abilities (fundamental capabilities) is not enough to guarantee the development of a subject's digital competency, especially if he/she is not able to transform this knowledge into responsible and media-aware behavior. In this sense, the combination of fundamental digital competencies and internal capabilities

determines the development of the so-called *combined digital capabilities* (or *digital capabilities*), or *soft digital skills*, which define the level and type of individual performance in the use of the media as well as other mediums. In these cases, digital soft skills can be broken down into diverse dimensions (and sub-dimensions) as follows (Celot & Tornero, 2009, Cortoni & Martin, 2006; Lo Presti, 2015):

1. Competencies of critical analysis
2. Competencies of awareness
3. Competencies of creative production
4. Competencies of citizenship

The relationship between competency and social capital: the research assumptions

Starting from a previously introduced overview of digital competency, the research aim was to build up an initial general picture of the digital knowledge, practices and aptitudes effectively acquired by pre-teens by means of mere media usage, beginning with an analysis of the influence stemming from social capital from more viewpoints (Trigilia, 2002).

The first perspective can be framed in a micro dimension (Coleman, 1988), where the subject's knowledge, abilities and aptitudes are directly proportional to the informational, cultural and cognitive corpus of the more limited context of socialization, which also includes the digital media (i.e family, school, friends). In other words, the level of knowledge, the ability, the use and behavioral attitude that the child established with the media during the years of his/her development reflect the type and the level of use and knowledge shared in the relevant social circles (for example, by parents or teachers) in terms of the attribution of value, the awareness of the social usage and the directions for the use of the medium.

The second enlarges the field of observation in the meso dimension: every specific competency, socialized within a specific family or school context, is inevitably influenced by public opinion, which is voiced through means of communication and diffused through the subject's neighbourhood or social community, spawning the reflections which shape models of media socialization within the social circles themselves.

The third can be collocated within the macro dimension and refers to the infrastructural sources and social, economic and political variables

within the social agencies which cross-condition the type and level of performance on which the competency is based. In this sense, structural availability, technological costs, family income, democratization of access, norms regulating the use and the policies incentivizing the digital culture circumscribe the type and the level of equipment available and its diffusion within the socialization agencies.

Starting from this initial framework, the educational model and that relative to family and school socialization are influenced by technology both in terms of access and infrastructural availability, as well as in terms of the style of media consumption and the level of competency acquired (Hargittai, 2008; Van Dijk, 2005). On the other hand, these variables construct behavioral profiles of the cultural mediation of the medium, which not only orient the child's digital behavior, but also influence his/her projection of social identity. In this sense, the digital, included among the variables at the basis of the social capital, intervenes on the development of the child's competencies, fundamental in the scholastic achievement and, generally, in orienting himself/herself in the digital era, that is in developing more or less autonomous and independent attitudes in relation to the continuous technological stimuli.

Pilot survey on "social capital and digital competency"

In order to verify our main assumption, a pilot survey has been proposed (and is still ongoing) involving pre-adolescents in the city of Rome to investigate how family and scholastic social capital impact on the development of abilities and attitudes in front of ICT devices, thus contributing to an increase or decrease in the maturity of the pre-teen's competencies, also those of a digital nature[2].

The tools for data collection are principally two:

1. Questionnaire on social capital for families;
2. Questionnaire on digital competency for children.

[2] The school was the mediation agency for reaching our audience: in particular, 30 secondary schools were taken into consideration, two per town/city area, and 3 classes were involved in each school (one from the first, one from the second and one from the third grade). Bearing in mind that there are on average 25 students in a class, we estimate that our sample will include around 2,250 students and their families.

In the first case, we started from the scientific and cultural research background to social capital (Donati, 2003; Censi, 2000, 2003; Livingston & Helsper, 2008; Nikken & Jansz, 2006; Sonck, Nikken & de Haan, 2013) in order to select some dimensions related to the three social levels of analysis of family social capital previously mentioned, as summarized in the table 1 below:

Table 1. Dimensions and indicators of the questionnaire for families

Social capital level	*Dimension*	*Indicators*
micro	Communicative style	Type of medium used Frequency of usage Media activity undertaken Cultural consumption Political orientation Religious orientation
	Educational style	Sociocultural values Shared educational behaviour Power of parental control in media consumption
meso	Degree of external trust	Relationships outside the family Institutions
	Relationship in the family	Type Intensity of relationship and of dialogue
	Sense of belonging	Climate No. of external relationships
	Quality of relationship	Contents of discussions and assistance within the family
macro	Infrastructural source	Technologies
	Social and demographical profile	Gender Age Education Type and position of the professional profile
	Structural properties	Type of family
		Numerosity

The objective of the research is to construct the profiles of the students' families' social capital, closely linked to socio-economic characteristics in some Roman schools in order to later analyze how they influence their children's perception of and relationship with the media.

In the second case, the aim was to pinpoint the interviewee's collocation within the general map of digital competencies, compared to the dimension of competencies identified (access, critical analysis, production, awareness

and citizenship), bearing in mind their age and experience in media usage (table, 2).

As we are well aware of how complex and delicate the issue is, the use of the questionnaire is planned in correlation with other tools, to be developed in the next phases of the research, for the assessment of every level of competency taken into consideration.

Table 2. Dimensions and indicators of the questionnaire for pre-adolescents

The level of the competency	*Dimensions*	*Indicators*
Access	Consumption behaviour	Type of medium used Frequency of use Predominant activity undertaken
	Knowledge	Recognizing digital services Conceptual definition
Critical analysis	Analysis and assessment of text	Recognizing digital textual codes
	Analysis and assessment of context	Strategies for selecting information in a research engine
Awareness	Management Awareness in consumption	Type of use of the web for carrying out tasks
Production	Production of contents Digital production	Knowledge of activities at the basis of digital production
Citizenship	Social participation	Engagement in political and social initiatives
	Social relation Self-evaluation	

Results and discussion

In this section, we present the initial results of the pilot study involving 436 students from 7 junior high schools in the Rome area and 268 parents[3].

The sample was selected in two steps: in the first, we focused on selecting the schools themselves, bearing in mind their being situated in seven diverse Roman municipalities (II°, III°, IV°, VI°, X°, XIV° and XV°) and their specific central or outer positioning within each municipality. In the second step, a non-probable "mass" sampling of students (and their parents) from three classes in each of the schools involved (a first-, second-

[3]The analysis units involved, which we illustrate here, do not correspond to the entire sample foreseen, as some phases of the study are still ongoing. More specifically, our selection was made bearing in mind territorial sampling criteria.

and third-year) was conducted, according to the teachers' willingness to take part.

Following a systematic analysis of median values obtained by the careful selection of the items in the questionnaires submitted to the students and their parents, *two sociocultural profiles* relative to the families in the classes involved in the study were elaborated.

1. A *lower-middle* sociocultural profile clearly emerges in three schools in the Rome suburbs (the Marco Ulpio Traiano school in south-west Rome, the San Gallo school, also in south-west Rome, and the Marco Castelseprio school in north-west Rome). Most of the families interviewed within this profile are not university graduates and their occupations are generally of a manual nature and do not require specific qualifications. From a cultural behaviour viewpoint, the main media used is the TV. As to the social and media consumption associated with this profile, although the use of web pages and social media appears to be transversal, and as such not directly linked to any particular profile, the cultural behaviour of these parents is not characterized by the use of other digital media. Outdoor behaviour too, such as going to the cinema, the theatre, practising sports or visiting museums, cannot be included among the habits of parents with this profile. They often spend time at bars with friends or use their spare time to do little jobs around the home.

2. The *upper-middle* sociocultural profile is concentrated mainly in four schools in central Roman areas (the Bitossi school, the Majorana school, the Via Volsinio school and the Cristo Re school). This profile is mostly made up of graduate parents who have highly-qualified occupations, such as managers or middle-managers, but also people from the highly specialized intellectual or scientific professions). From a cultural behaviour viewpoint, this profile appears to be characterized by a wide and diversified cultural consumption, both with regard to digital devices and outdoor leisure time activities. In the former, the main media tools used by the parents we interviewed were satellite TV, daily newspapers (both in paper and digital formats), the pc, tablets, e-books and on-line magazines. These tools were mainly used for matters linked to finding information, research and understanding in greater depth, such as "reading the news on-line" and "consulting Wikipedia and online encyclopaedia". Families like this often use on-line means of communication too, from the more traditional, such as email, to the more innovative, such as video calls on the web; there are, too, parents who use the web "to shop on-line". As far as

outdoor activities are concerned, a wide cultural and intellectual vivacity, focused mainly on activities like going to the theatre, taking part in exhibitions or cultural events or practising sports, can be discerned, although they also enjoy spending time at home with their families (See: table 3 and table 4 - Appendix).

Adopting these two profiles, we analysed the cultural behaviour and digital competencies (digital soft skills) of the pre-teens interviewed. More specifically, while taking into consideration the proficiency of the school, which incorporates the sociocultural characteristics of the families of the students taking part in the research, in orienting the youngsters' cultural and digital behaviour, an analysis of the results was conducted (Cherkaoui, 1979). In this sense, the analysis was carried out bearing in mind both the behaviour and digital competencies which do not depend on the sociocultural profiles of the students' families as previously indicated, and behaviour which clearly discriminates the two profiles.

Thus, as far as the cultural consumption of the pre-teens is concerned, the use of smartphones and tablets is extended transversally to all the interviewees, with extremely high percentages. In particular, the digital activities which occupy a stable position in the youngsters' media consumption, independently of their sociocultural profile, are: "watching videos on websites (You Tube, Mega Video)" or "listening to music on the web" and "using search engines".

From an infrastructural viewpoint, the families' technological equipment contributes toward limiting the media most frequently used both by the parents and the youngsters interviewed, determining intergenerational consumption gaps. In this sense, the students from families with a *lower-middle* sociocultural profile appear to watch TV – digital terrestrial TV, both free and pay-to-view – frequently, but also read books in paper format. On the other hand, pre-teens from families with an *upper-middle* sociocultural profile are more oriented toward the use of digital media and taking part in a wide variety of associated activities. Thus, for example, the use of the pc and tablets by pre-teens with a high sociocultural profile is accompanied by accessing daily newspapers, both in paper format and on-line, and the use of the smart TV. Already from these initial indications, a link between the cultural habits of parents and those of their children, e.g. the focus on information in families with an upper-middle sociocultural profile, which is reflected in their youngsters' reading daily newspapers, can be noted.

On examining in greater detail the competencies of the pre-teens we interviewed in accessing technology, their most widespread knowledge of the digital sphere, independently any of sociocultural differences, appears mainly to regard browsers (Internet Explorer, Google Chrome, Mozilla Firefox…), the various operational systems, such as android, and multi-media hard disks. Similarly, other digital offerings, such as multi-media presentations like Prezi, Slideshare, etc. and e-learning platforms, seem to have no part in this generation's background knowledge. Furthermore, while pre-teens from a lower-profile sociocultural background appear not to be in possession of selective digital competencies, those with a higher sociocultural profile make greater use of e-mail and e-commerce, exactly like their parents. Their digital knowledge, too, seems richer and more diversified: they definitely know about tablets (IPADs), video-sharing sites such as YouTube, cloud services such as Google Drive and Spotify for listening to music in streaming and the sharing of music, and also what Blue Ray disks are (See: table 5 and table 6 - Appendix).

From the overview we have just presented, two observations can be made: on the one hand, some digital competencies linked to age are gained mainly through personal use of the media and therefore focused on those devices and activities preferred spontaneously at that age, without any sociocultural mediation on the part of adults (such as knowledge of browsers, operational systems and hard disks, probably linked to the use of tablets and smartphones and used mainly for research purposes, watching video material and listening to music). This correlation is particularly evident respecting the dimension of access, i.e. the first dimension of digital competencies, focused on the shared knowledge of the units of analysis we interviewed. On the other hand, more sophisticated competencies of access, such as the knowledge of sites for sharing files or music and of Blue Ray, which are linked to activities like reading daily newspapers (also on-line) and the use of e-mail and web telephone services, as well as e-commerce, depend directly on the impact of the sociocultural profile of origin, often giving rise to intra-generational cultural gaps.

If we shift our attention to the critical dimension[4] of digital competencies, the family sociocultural profiles we referred to earlier have a lesser impact on the development of abilities in the pre-teens we

[4] Established through questions focused on "recognising digital text codes on a web site" and "strategies in the selection of information in a search engine", as indicated in table 4.

interviewed. We can therefore assert that across-the-board competencies do not always depend on the family's sociocultural influence, and neither do they develop starting from the youngster's direct media auto-socialization.

It is therefore possible to hypothesize that other forms of cultural mediation, such as that of teachers, may intervene in the development of such competencies. This theory would appear to be supported by the data analysed, according to which the elements that capture the pre-teen's attention when he/she visits a website in the course of a simple media experience are mainly linked to the aesthetic (images, words and graphics) and ethical (the contents and how up-to-date they are, and their coherence with reference to the search aims) dimensions and not to the author's ideology or the production context (i.e. the site's reputation, from which the reliability and credibility of the information to be found there can be deduced, or the segment the site belongs to – e.g. medical, juridical, etc.). Thus, hypothetically, teachers could intervene effectively by implementing such aspects of critical competency with regard to the digital, adopting strategies (typical of Digital Education, Buckingham) for the ideological and contextual analysis of a literary, historical geographical or scientific text, starting with the stimulus of digital texts (e.g. a video, an app, an image a website or an audio text).

Conclusion

From an initial analysis of tests relative to digital competencies (digital soft skills) among pre-teens, several considerations emerge.

Firstly, the overview outlined by the initial data appears to indicate a generation of pre-teens who, in matters of digital competencies, inhabit a dimension of technological access and critical analysis, but only as far as the most widely-used media tools, tablets and smartphones, are concerned, and through their use the pre-teens develop direct experiential knowledge and abilities. The latter, in particular, seem to be mainly of a basic level, and focus on the aesthetic and ethical characteristics of the messages exchanged and shared, while an analysis of the industrial background behind the production of digital messages still appears to be absent. The other across-the-board digital competencies, such as creative production, awareness and citizenship, seem to be underrepresented within this age group, independently of their sociocultural profile of origin, and therefore

without a direct impact of their family social capital on their development. One possible hypothesis is that such competencies could develop from the onset of adolescence, and that cognitive maturing would be such as to allow the implementation of further across-the-board competencies (Vygotskij, 1934), if suitably stimulated within the traditional socialization contexts like the family and the school.

Secondly, scholastic and family sociocultural profiles, starting from the range of infrastructures available (the possession of technology, or lack of it) and the cultural and media habits of adults (styles of usage with reference to diverse media devices), intervene in diversifying pre-teens' cultural behaviour. These variables contribute to generating an intra-generational gap and diversified profiles among digital natives.

This pilot study represents only the initial, indicative phase of a sociological investigation in this area, and is part of a wider programme of theoretical reflection and research into digital competencies. The successive steps will focus on operationalizing every dimension of digital competency and on the development of evaluation tools which can target the issues more effectively, bearing in mind the diversity and multiplicity of technologies present within the digital system.

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Appendix

Table 3. Digital media use frequency of families for socio-cultural profile (variance analysis)

	Socio-cultural profile		
	lower-middle	upper-middle	AVG
Internet	1,86	1,96	1,92
PC	1,66	1,88	1,78
smartphone	1,58	1,77	1,69
books	1,41	1,6	1,51
radio/web radio	1,37	1,51	1,45
free digital terrestrial	1,42	1,4	1,41
tablet	1,29	1,46	1,39
news on line	0,97	1,37	1,2
magazines	1,01	1,07	1,04
newspapers	1,04	1,08	1,06
satellite	0,66	0,87	0,78
mp3	0,63	0,95	0,81
on line magazines	0,71	0,98	0,86
e-book	0,39	0,74	0,59
pay TV digital terrestrial	0,38	0,35	0,36
smart TV	0,3	0,34	0,32

Table 4. Knowledge and use of digital services of families for socio-cultural profile (variance analysis)

	Socio-cultural profiles		
	lower-middle	upper-middle	AVG
search engine	1,7	1,87	1,79
email	1,48	1,74	1,63
news on websites	1,24	1,55	1,41
on line banking	1,12	1,49	1,32
Wikipedia/ online encyclopaedia	1,13	1,41	1,29
Listening music or webradio	1,32	1,27	1,29
on line videostreaming	1,25	1,25	1,25
news on SN	1,23	1,2	1,21
PA websites	0,94	1,19	1,08
Shopping on line	0,8	1,17	1,01
uploading images, video…	1,08	0,95	1,01
participating to SN	1	0,96	0,98
dowloanding video, music	0,86	0,95	0,91
calling via Internet	0,64	0,92	0,8
posting news on SN	0,62	0,51	0,56
on line games	0,56	0,48	0,52
giving own opinions through the web	0,29	0,44	0,37
creating webpages	0,32	0,33	0,33
writing on blogs, wikis	0,26	0,27	0,27

Table 5. Digital media use frequency of students for socio-cultural profile of their families (variance analysis)

	Sociocultural profiles		
	lower-middle	upper-middle	AVG
Internet	2,79	2,84	2,82
Smartphone	2,74	2,78	2,76
Tablet	2,37	2,53	2,46
Pc	2,39	2,51	2,46
Book	2,27	2,35	2,31
Digital terrestrial	2,31	2,14	2,21
Mp3	2,07	2,19	2,14
Satellite	1,75	1,98	1,88
Radio/webradio	1,71	1,84	1,78
magazine	1,66	1,76	1,72
On line news	1,54	1,55	1,54
Pay TV digital terrestrial	1,54	1,45	1,48
Newspaper	1,39	1,53	1,47
E-book	1,4	1,50	1,45
On line magazine	1,42	1,34	1,38
Smart TV	0,99	1,32	1,18

Table 6. Knowledge and use of digital services of students for socio-cultural profile of their families (variance analysis)

	Socio-cultural profiles		
	lower-middle	upper-middle	AVG
Search engine	1,86	1,87	1,87
Video calling	1,82	1,86	1,84
Video Streaming	1,77	1,85	1,82
Browser	1,8	1,75	1,77
Downloading music	1,62	1,72	1,67
Photosharing	1,55	1,6	1,58
Social Network	1,59	1,52	1,55
E-mail	1,46	2,58	1,53
Operating systems	1,28	1,51	1,41
E-commerce	1,18	1,39	1,3
Cloudstorage	0,72	0,77	0,75
Downloading	0,69	0,65	0,67
Web Blog	0,53	0,61	0,58
Prezi	0,35	0,57	0,48
E-learning	0,36	0,31	0,33