LoDE: Learners of Digital Era

From the analysis of the current debate to an empirical study emphasising the learners' perspective

A dissertation presented by

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To Serena,

who is always able to see in me more than I can.

BOARD

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Concerning my texts, I used in the dissertation parts of other works I did. At the beginning of each chapter, already published documents on the topic are listed, and then quoted, when it is the case.

ABSTRACT(English)

Since the 1990s, a wide debate has been generated around the "learners-new media dichotomy", with a consequent journalistic reverberation. In particular, expressions like “digital natives”, “Y” generation, or “net-generation” contributed to diffuse the hypothesis that– since the 1980s – a generation of learners with typical characteristics related to their great familiarity with digital technology could be identified.

Such a debate has been widely dominated by commentators who expressed a confident attitude towards that generation, stressing how their common peculiarities were extremely positive at the social, cognitive, and learning levels. On the other hand, the impact that new media could have on such a huge range of people caused great concerns too. Recently, critical voices have jointed the debate: they put in doubt that these "labels" are useful for an accurate understanding of reality, and notice that scientific evidences of this fact are very limited.

This dissertation is based on the analysis of these controversies, and is aimed to focus the debate, offering a strategy to overcome the mere antithesis between the different interpretations. In order to do so, the empirical research *Learners’ voices at USI-SUPSI*(run in Ticino, from October 2009 to June 2011) is presented. This research explores in depth this theme and observes the role that ICTs (Information and Communication Technologies) play in USI (Università della Svizzera italiana)and SUPSI (Scuola Universitaria Professionale della Svizzera Italiana) students' learning.

This research falsifies the presence of a unique cohort of learners, putting in evidence different positions within the same age range and similar behaviours among individuals with different socio-demographical characteristics.

RIASSUNTO (Italiano)

A partire dagli anni 1990 si è sviluppato un ampio dibattito, e una conseguente estesa pubblicistica, intorno al binomio apprendenti e nuovi media. In particolare, espressioni come "nativi digitali", "generazione Y", o "net-generation" hanno contribuito a diffondere l'ipotesi che – a partire dagli anni 1980 – fosse identificabile una generazione di apprendenti con caratteristiche proprie, correlate alla marcata familiarità col digitale.

Tale dibattito è stato ampiamente dominato da voci che hanno espresso un atteggiamento fiducioso nei confronti di questa generazione, insistendo su tratti comuni particolarmente positivi a livello sociale, cognitivo, di apprendimento. D'altra parte, sono emerse anche posizioni preoccupate per l'influsso dei nuovi media su tale vasta platea di soggetti. Recentemente, poi, sono apparse anche voci critiche: esse mettono in dubbio che tali "etichette" aiutino per una più adeguata comprensione della realtà; e osservano inoltre il limitato numero di evidenze scientifiche in proposito.

Questo lavoro di dottorato muove dall'analisi di tale controversie, proponendosi d'inquadrare il dibattito e di offrire una strategia per superare la semplice contrapposizione tra le diverse interpretazioni. A tal fine, viene presentata la ricerca empirica *Learners' voices at USI-SUPSI*(condotta in Ticino, dall'Ottobre 2009 al Giugno 2011) . Essa esplora nel dettaglio la tematica, osservando il ruolo che le TIC (Tecnologie dell'Informazione e della Comunicazione) giocano nell'apprendimento degli studenti dell'USI – Università della Svizzera italiana – e della SUPSI – Scuola Universitaria Professionale della Svizzera Italiana.

Tale ricerca smentisce la presenza di una coorte univoca di apprendenti, evidenziando posizioni diverse all'interno della stessa fascia d'età e comportamenti simili tra soggetti con caratteristiche anagrafiche e socio-demografiche diverse.

AKNOWLEDGEMENTS

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- The CERI (Centre for Educational Research and Innovation) at OECD (Organization for Economic Co-operation and Development), where I experienced the practice of the international research arena.

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I started my PhD on 1st of April, 2008. Since that date, eight people have been playing a great role in this challenging navy cross.

Prof. Lorenzo Cantoni patiently supervised my plans, throughout the stormy sea of research during the past four years.

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Doubtless, I have to thank my father Vittorio, my mother Livia, and my sister Federica: I begun to bother them – talking of education and new media– when I was sixteen; and I’m still on the same topic.

I have to express all my gratitude to Samanta Ciannamea, who (almost) lost he eyes working on the dataset.

Finally, I must mention three great friends for their big help: Rossella Icardi, who tried to make me familiarize with numbers and statistics, and in meanwhile, discussing about “how to avoid unexpected and unsolvable difficulties in life”; Austin Delaney, who suffered all the abuses I unintentionally provoked to his language, and in change provided me many valuable hints; and Valerio Quassolo, who demonstrated me that a human translator has many more features than Google Translate (i.e.: teaching me how to play guitar).

TABLE OF CONTENTS

List of acronyms (alphabetical order)

CLMS: Contents and Learning Management System

CSCL: Computer Supported Collaborative Learning

CERI: Centre for Educational Research and Innovation

DN: Digital Natives

DI: Digital Immigrants

ELab: eLearning Laboratory of USI-SUPSI

EPFL: École Polytechnique Fédérale de Lausanne (Switzerland)

GenY: Generation Y

GenY@work: Generation Y at work *(research project)*

HEI: Higher Education Institution

ICT (plural ICTs): Information Communication Technologies

JISC: Joint Information Systems Committee (UK)

LMS: Learning Management System

LSP: LEGOSERIOUS PLAY

LoDE: Learners of Digital Era

LV@USI-SUPSI: Learners' Voices at USI-SUPSI *(research project)*

LV@UWIOC: Learners' voices at UWIOC *(research project)*

ME: Media Education

mLearning: Mobile Learning

MMOG: MultiMedia Online Gaming

NewMinE Lab: New Media in Education Laboratory – Lugano (Switzerland)

NML: New Millennium Learners

OECD: Organisation for Economic Co-operation and Development

PISA: Programme for International Student Assessment

SNS: Social Networking (Web)Site

SUPSI: Scuola Universitaria della Svizzera italiana – University of Applied Sciences and Arts of Southern Switzerland

USI: Università della Svizzera italiana – University of Lugano (Switzerland)

UWIOC: University of the West Indies – Open Campus

ZPD: Zone of Proximal Development

List of figures

List of tables

INTRODUCTION

Foreword

Dear reader, what you are about to read is a PhD thesis about eLearning, the role of ICTs in education, learners' expectations and expectations on learners. The text will not provide you any shocking breaking news, neither catchy rhetorical claims, but rather little bricks of sound knowledge and evidence-based reflection. Three and half years ago, when I started my PhD experience, I was expecting to find outstanding and decisive results for the foundation of the Pedagogy for the 21st century. Fortunately, my romantic vehemence to know and to be considered a pedagogical reference was mediated by reality; then, the most relevant things I have learned during this period are likely to be considered not much different from good sense. Actually, my willing to obtain something great is the first reason to appreciate the (at the end of the story) little results I am going to show you and discuss. Being a PhD candidate – researching in such an interesting and controversial field of learning in the digital era –gave me the possibility to discover how worthy a considered and open conclusion can be, even if not astonishing.

Sincerely yours,

Emanuele

Intro

Some starting general reflections

I would like to move from some (provocative) pieces of evidence that – at least once in life – everybody can register, suggesting that something went wrong in the knowledge society (as it was expected to be). Contradictions of current times that we are experiencing in everyday life. Let me show some examples.

Every three years I am (almost) obliged to throw away my laptop, while my adolescence favourite book (*Cien años de soledad,* G.G.Marquez) is still there in my library – worn and yellowed, of course, but I was not asked to upgrade it, neither I was blocked to read it again because of an out-of-date license.

Also, thanks to the internet and the sharing of knowledge, information and communication – especially via the so-called web 2.0 – I can access a (potentially) infinite amount of data; but, unfortunately, I do not have a brain 2.0 (neither I can rent part of underused brains all over the planet) able to store an infinite amount of knowledge.

Very "smart" devices combined with user-friendly online facilities allow me to be connected 24/7 but I do not have so many precious things to communicate to the world (even in this volume you could find that I put more information than needed). In the last three years – also due to the hermitage and nomadic condition typical of being a PhD – I spent more time social networking online than drinking beer or eating pizza with my friends.

More seriously speaking, controversies of digital living are becoming more and more discussed, day by day. Techno-fanatics and techno-luddites constitute the two extremes of these debates. On one side, ICTs have been conceived – and are expected – to improve and to empower humans' life. Nonetheless, they are impacting on our behaviours very fast, not infrequently with side effects. This issue is happening to be relevant in the researchers' agenda, especially in terms of the impacts on learning and thinking.

Just to mention a recent study, which received a great popularity, “the world unplugged” by Moeller an colleagues (2011) observed feelings and emotions connected to digital usages, providing a worldwide comparison. The study, entitled “Unplugged: 24 Hours without Media”, involved nearly 1,000students worldwide. Participants were asked to give up all use of information and communication technologies (ICTs) for 24 consecutive hours; and to engage in a process of reflection about their relationship with media. The next figure it shows how participants felt, after one day of non-connectedness, clustered by countries. It emerges a reality in which negative feelings overwhelm the perceived benefits of being unplugged. As pinpointed by authors, *“Students’ ‘addiction’ to media may not be clinically diagnosed, but the cravings sure seem real – as does the anxiety and the depression*”.

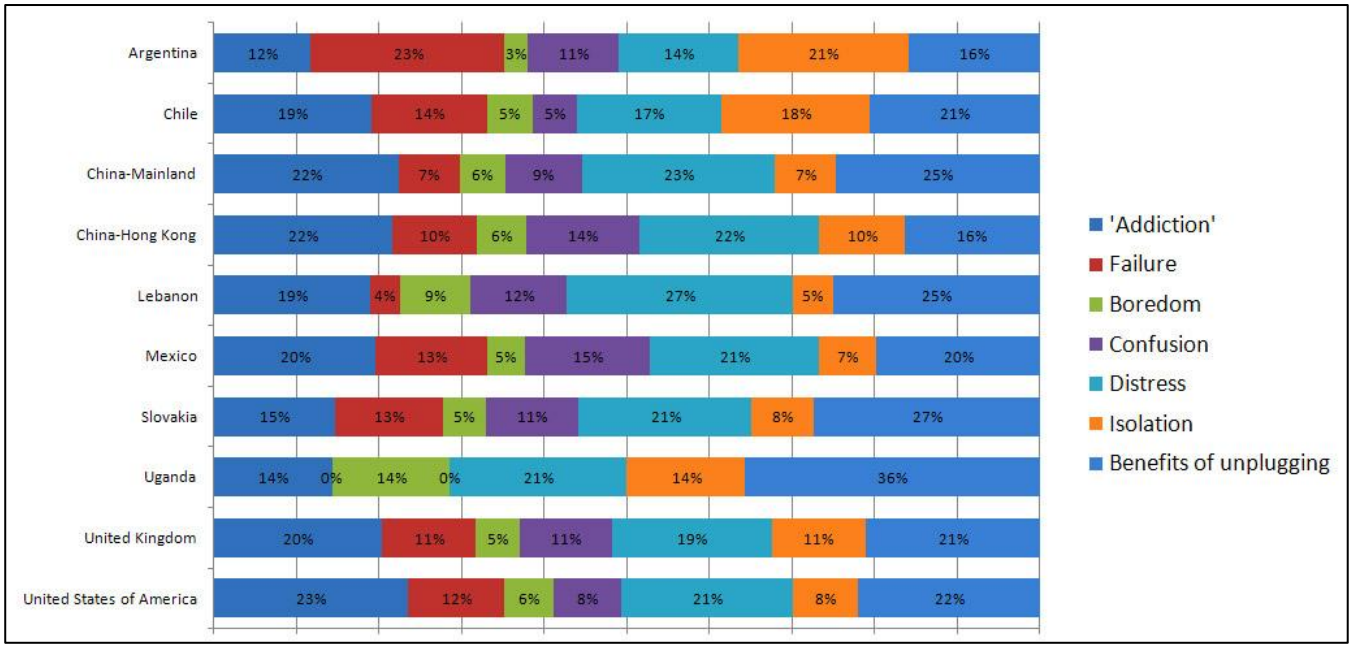


Fig. 1: emotions after 24h of being unplugged, countries comparison
(Source: theworldunplugged, 2011)

It is not necessary to provide other examples to see my point of view; briefly, along with an uncountable number of privileges, there are many unexpected consequences due to dark sides of living in a digital era. Given the fact that the positive and negative sides of

ICT impact on our everyday life, it is likely that impact of these play an important role also in the field of learning.

If excluding the biographical peculiarity of what I wrote so far, it is likely that everybody could make similar considerations. And this is exactly what happened in the past ten years: it is possible to find a never-ending list of contributions trying to describe our modern times, with a crucial split among the commentators who are enthusiast about the *digital* present and the ones who are nostalgic of an *analogic* past. Paired with the controversies, there are great benefits. The debate still lacks a comprehensive and mature reflection about the future, and not in terms of what (and how) ICTs can offer us for a better life, but rather in terms of anthropological reflection. The case study mentioned above challenges our conscience in terms of "how can we teach the citizens-to-be..."“...to learn everything?”“...to select worthy info?”“...to balance their online and face-to-face self-projection?", and so on and so forth.

Lacking a comprehensive perspective on learning in the digital era

Unfortunately a unique, shared, multidisciplinary, and sound vision does not exist; the most relevant pieces of knowledge can be understood as best practices or good intuitions.

This work tries to serve this cause, travelling through two converging paths:

- What is said/thought/expected/forecasted/hoped about learning in the digital era (part I).
- Which is the experience of learning with ICTs and eLearning from the point of views of learners (part II).

The rationale behind the present research is to understand the gap between expectations on learners using ICTs, and the learners' point of view in order to improve and customise (e-)learning experiences.

The two key-assumptions of the Knowledge Society are: living nowadays means living in a digital environment; this environment impacts on our everyday life, then on learning experience. Even if, *a priori*, this reasoning allows us to expect young learners (grown

up in the digital era) to be “digital learners”, we must recognize, *a posteriori*, that such expectations very often do not come up. Just to offer two examples: the high dropout rates of eLearning in vocational training (see, for example: Succi & Cantoni, 2008), and the non-enthusiastic acceptance in universities by students (see, for example: Bullen, Morgan & Qayyum, 2011).

Why “digital era”? Who are LoDE?

These questions will be answered completely in paragraph 4.1, but here it is necessary to pinpoint one of the key-messages of this research: the expression “knowledge society”(World Summit on the Information Society, 2003) represents more a promise, a faith, and a potentiality, rather than being a descriptor of a matter of fact (Rapetti, 2011). It is a rhetorical artefact, which can be useful to communicate and to sum up the complex reality of post-modern times, but it implies a number of assumptions and expectations; some of those are questioned by data-evidence, for instance the infinite possibility to access knowledge.

The same happens to many labels attributed to nowadays learners. Hence the need to adopt non-misleading concepts to build on the discourse in this dissertation. “Digital era” is used to describe – in the most neutral way is possible – the current reality of the large majority of OECD countries, that is the permeation of digital devices in everyday life experience. “Learners of digital era” is used to refer to all the people who – formally or informally – use ICTs in learning experiences.

Four relevant issues

This research faces four theoretical issues, which need to be put in evidence.

First, the aim of the study is to understand how the digital context impacts on learning. This binds to observe and to reflect on both learning with ICTs in private-personal context and eLearning in institutional settings (e.g.: online platform). It is necessary to comprehend formal and informal learning jointly. The research structure is meant to pair this two experiences of digital learning, without melting the differences.

Second, it has been observed that one of the main difficulties of eLearning is the problem of unbalancing the attention on ICTs rather than on people(Cantoni, *et al.*, 2007). In order to respect the anthropological primacy of human being on machines (and to avoid the deterministic drift), the literature review has been approached with a critical attitude; the adoption of the expression LoDE is due to the same objective.

Third, eLearning developed very quickly and efficiently over the past two decades in terms of technological improvement (concerning both hardware and software, at prices day by day more achievable). But it is (still) looking for a new related pedagogy (Morrison, 2007); furthermore the so-called "pedagogy for the 21st century" – built on the toolbox of "21st century skills" (Ananiadou & Claro, 2009) seems to be far to be adopted fruitfully. In summary, eLearning does not proceed along with a complementary eDidactic (D'Angelo, 2007).

Finally, when I started my research (in 2008) Prensky's theses about the divide between digital natives and digital immigrants, and the need to teach *digitally* were absolutely dominant (Prensky, 2001a; Prensky, 2006). Despite his work was persuasive and built on the line of reflection, led by important intuitions, about informal learning and the role of the web in education (Tapscott, 1998; Oblinger & Oblinger, 2005; Veen, 2006), many points needed to be demonstrated and critically questioned – at least before to transpose them from US to Europe *talis qualis*. Furthermore, many handbooks addressed to educators and teachers were published on the bases of such assumptions (probably, the most diffused is: Junco & Mastrodicasa, 2007). Only recently this approach encountered criticisms (Bennett, Maton, & Kervin, 2008; Bullen, Morgan & Belfer, 2008; Schulmeister, 2008), but three years ago seemed to be a crucial step to discuss and proof it in our university context.

Mafalda – the genial character invented by Quino – might help us in unveiling how this "generational theory" is powerful and convincing, when taking into consideration people and new technology. As the little girl says in the next strip *"Nada detiene el avance de una nueva generaciòn tecnificada. Y menos, una vieja generaciòn desprestigiada"*

(Nothing can arrest the advance of a new technologized generation. And definitely not an old discredited generation). This is the mindset founding a long-lasting reflection about the generational gap. And, *mutatis mutandis*, there has been a twenty years debate focused on such issue.

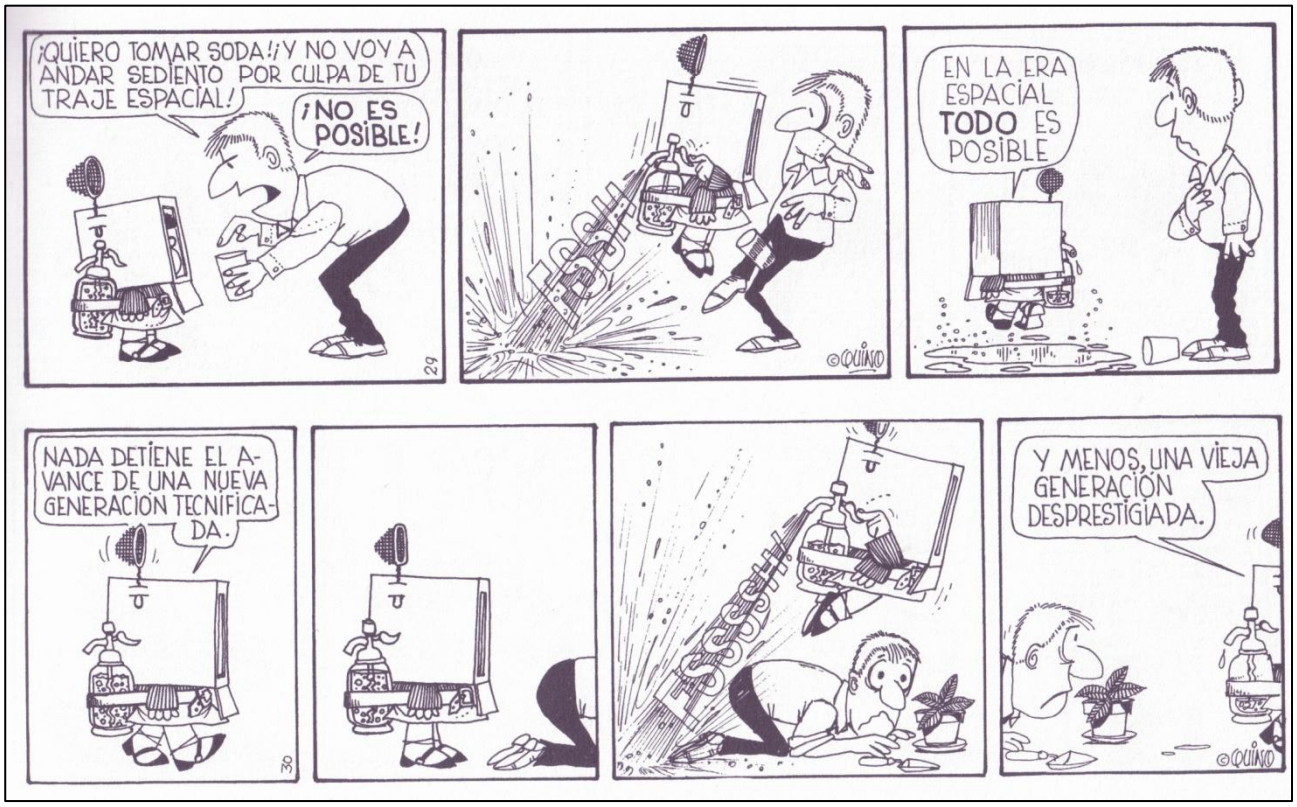


Fig. 2: "Nueva generaciòn tecnificada"
(Source: Quino, 2004)

The architecture of this dissertation:

The **macro-question** of this research is: which are the effects of ICTs` usages in learning experiences (both formal and informal ones)?

The **perspective** of analysis is at the crossing of four disciplines: Communication Sciences, Sociology, Pedagogy, Anthropology.

The **subjects/objects** of analysis are learners and ICTs (in a double vector): learners using ICTs and ICTs in learning experiences.

The **context of analysis** is higher education in Ticino (Switzerland). The study was carried at the Università della Svizzera italiana and Scuola Universitaria della Svizzera Italiana. The final sample was composed of 562 respondents to an online questionnaire, and 22 active participants plus 19 observers/contributors (total: 41 people) to the qualitative research phase; this latest sample involved two "LEGO sessions" and three media diet diaries.

The **research goal** is to check if expectations and reality about LoDE are aligned, and – in case they are not – to suggest some exit-strategies.

The **theoretical inputs** are: the reflection about eLearning and learning in the knowledge society; the dominant voices in the literature about nowadays learners

The **empirical inputs** are: a quantitative questionnaire answered by 562 USI-SUPSI students; qualitative almost-ethnographic methods (such as: LEGO sessions, and media diet diaries)

The **outputs** are:

- a reflection to identify correctly who are nowadays learners (namely, the LoDE perspective);
- some bricks of sound knowledge in the field of 21st century skills, in order to improve the state of the reflection about eDidactics;
- the combination of quantitative and qualitative results of research project LV@USI-SUPSI.

The **outcomes** can be understood as: advices for policy makers, stakeholders, professors, instructional designers, scholars, and pedagogists; besides, the results coming from data-evidence can be used to better customise eLearning within the Ticino context. It is not possible to generalise directly this reality to the world, but there are some (g-)local (neologism coined to express together the concepts of local and global) lessons to share.

Panorama of the dissertation

As said, part I is the theoretical one; it is meant to address the topic (Ch.1) and to set it within a consistent framework (Ch.2). Moving from dominant voices in the huge literature on the subject (Ch.3), the LoDE perspective is outlined and explained (Ch.4). Furthermore, preliminary case studies relevant for the research are presented (Ch.5).

The second part of the PhD is devoted to present the research "Learners' Voices at USI-SUPSI", its background, its architecture and methodology, and the importance of LoDE perspective for it (Ch.6); then, research results are shown, both qualitative and quantitative (Ch.7).

Finally, in the conclusion (Ch.8), it is possible to read the outcomes and their relevance for scholars, policy-makers, and practitioners.

Chapters 3, 4, and 7 contain the most innovative part of the research work.

PART I:

LEARNERS AND NEW MEDIA IN THE THIRD MILLENNIUM

Chapter 1: Addressing the topic

In chapter 1 the topic of learners and new media in the third millennium is addressed. This will structure the whole first part of the dissertation, so it is necessary to put in evidence why and how it is so important.

In order to avoid any misunderstanding, paragraph 1.0 is meant to clarify the use of key-expressions such as: eLearning, knowledge society, digital learners, and ICTs.

The topic is considered to be meaningful in reason of its interest, urgency, and usefulness in the field of dropout.

Paragraph 1.1 faces the question "why is it interesting?", and explores the related theme of informal learning.

In paragraph 1.2 the urgency of the topic is debated, showing the complexity hidden by it, and the uncertainty implied in the public debate.

Finally, the chapter ends focussing on the dropout issue in the third paragraph.

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- OECD-CERI. (2012). *Connected minds: Technology and today's learners*. Paris: OECD-CERI (Centre for Educational Research and Innovation).
- Rapetti, E. (2004). *L'educazione nel sistema scuola-territorio. un progetto di Media Education per una scuola civica.* (Unpublished Bachelor's Thesis). Milano, Italy: Università Cattolica del Sacro Cuore.
- Rapetti, E., Butti, M., Misic, S., Botturi, L. & Cantoni, L., (2009). Realizing the technological potential of young employees with LEGO bricks. *Ethnographic Praxis in Industry Conference Proceedings - August 30 – September 2, 2009* (pp.343-347). Chicago, IL-USA.
- Rapetti, E., Cantoni, L. & Misic, S. (2009). New cultural spaces for learning: The learners' voices. In *Webasculture Conference Online Proceedings,* Giessen, Germany. Retrieved from http://webasculture.de/index.php?id=75.
- Rapetti, E., Vannini, S. & Picco, A. (2011). Is mobile learning a resource in higher education? data-evidence from an empirical research in Ticino (Switzerland). *Je-LKs, Journal of eLearning and Knowledge Society-English Version, 7*(2), pp.47-57. Retrieved from: http://je-lks.maieutiche.economia.unitn.it/index.php/Je-LKS_EN/article/viewFile/520/526.

1.0: Key-concepts used in the dissertation

In this dissertation, three expressions are used continuously: the umbrella-concepts of *eLearning, knowledge society, and digital learners*. Though they are common use terms, scholars charge them with specific meanings, depending on different research contexts. So they may ingenerate confusion in the reader. According to the literature which is theoretically in line with this doctoral research, the definitions leading our interpretations of such concepts are the followings.

Firstly, *eLearning* is intended to have the wide meaning of digital learning, or learning via digital devices. In 2001, European Commission provided this description in the *eLearning action plan*:

> the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration (CEC 2001: 2).

Many efforts have been done to sharp and distinguish peculiarities of any name/acronym describing the use of digital technologies in education – from Computer Assisted Instruction, through Computer Supported Collaborative Learning or Distance Learning, to Web Based Training. In this dissertation, the expression eLearning is used to refer to the whole corpus, because of its widespread (for a detailed discussion of it, see Cantoni, *et al.*, 2007 pp.23-37).In the understanding of this text, any new media in education can be a tool for eLearning. With a specific attention to any so-called "blended" learning experiences. ICTs and internet represent the critical steps of training in the knowledge society (for a discussion of it, see Cantoni&Tardini, 2006 pp.176-182).

Furthermore, except when specified, this researchwill refer both to online and offline learning experiences, if mediated by ICTs. In addition, even if it is quite diffused, eLearning will not be used as synonym of LMS (Learning Management System), CLMS (Content & Learning Management System) or similar.

Secondly, the definition of the *knowledge society*shall be oriented around the first article of the Geneva declaration:

> We[...]declare our common desire and commitment to build a **people-centred**, **inclusive** and **development-oriented** Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights(art. 1, World Summit on the Information Society, December 2003,bold added).

Scholars like to claim that we live in a society whose paradigm is knowledge because we have tools that allow to reach it (Burch, 2005). Goals can be communication, sharing information, requesting feedback, achieving suggestions, looking for data, etcetera. In a word, knowledge – in one or more of its multiple and scattered facets.

Similarly to the previous case, it will be considered as a broad concept describing the socio-economic-cultural-educative context in which we live. Under "knowledge society" all the expressions such as information Society, network Society, digital era are included.

Thirdly, the expression *digital learners* is used to refer generically to all those labels – Digital Natives, Generation Y, Net generation, etc. –elaborated on the assumption that the current generation of learners has been so deeply affected by ICTs to the extent we must consider them as "digital". This point will be discussed in details in chapter 3.

Likewise, the expression *digital approach* to learning must be understood to sum up the pedagogical idea behind such labels. To have a deeper understanding of what the digital approach is, it is worthwhile to read the following passage:

> There is one thing you know for sure: **these kids are different**. They study, work, write, and interact with each other in ways that are **very different from the way you did growing up.**They read blogs rather than newspapers. They often meet each other online before they meet in person. They probably don`t even know what a library card looks like, much less have one; and if they do, they`ve probably never used it. They get their music online – often for free, illegally – rather than buying it in record stores. They`re more likely to send an instant message (IM) than to pick up the telephone to arrange a date later in the afternoon. They adopt and pal around with virtual Neopets instead of pound puppies. And they`re connected to one another by a common culture. Major aspects of their lives – social interactions, friendships, civic activities – are mediated by digital technologies. And they`ve never known another way of life (Palfrey & Gasser, 2008, p.2, bold added).

As it has been observed, all the three concepts are very powerful, and any of them turns around the innovative presence of digital devices in our lives. Indeed, when we talk about knowledge society (Castells, 2000; Burch, 2005)we imply a rhetoric about the effects of digital devices in our learning processes; or, when we talk about eLearning (Cantoni *et al.*, 2007) we advocate implicitly a new and/or different idea of learning and teaching dynamic; or, when we consider younger learners as *digital* we rhetorically attribute to them peculiar characteristics, and we automatically expect from them to owe a sort of *technological potential* (Rapetti, e*t al.*, 2009) in learning.

Additionally, we must specify that “new media” is meant as synonym of ICTs – standing for Information and Communication Technologies.

Finally, a linguistic-semantic disambiguation: in the text the expression “dichotomy” is often used. The term comes from the ancient Greek: "διχοτομία" composed of *dich-* (= in two) and *tomia-* (= cutting, incision). Hence, the usage of “dichotomy” occurs in this

dissertation to express a couple of concepts and/or entities which are clearly separated, but which have to be considered together (i.e: “dichotomy learners and new media”, “dichotomy ICTs and learning”, and similar ones). Coherently, the expression is not used in the sense of a partition of the whole where the two parts are mutually exclusive.

1.0.1: Umbrella-concepts drive to ask some critical questions

Such etymological elucidations provoke some critic-speculative questions.

What does it mean to claim that we live in the Knowledge Society? We almost use this concept as description of our world and reality, trusting in the power of ICTs to make knowledge accessible for everyone; to the extent to consider the knowledge as the paradigm of our society. However, the evidence about knowledge gaps and digital divides (Marshall, Kinuthia, & Taylor, 2009) typifying contemporary times, implies that “knowledge society” represents more a promise, a faith, and a potentiality, rather than being a descriptor of a reality. Experts in the field of ICT4D (Information Communication Technologies for Development) report that those gaps are evident when comparing rich countries against developing countries (Unwin, 2009). In addition, it has to be said that, even within developed contexts, there are still unbalances in terms of technological limits, effective long-range policies of access, and prolific actions to improve media literacy (OECD-CERI, 2010a; Pedró, 2010). In a global view, if observing the field of the so-called “Pedagogy for the 21st century”, it seems that the work done so far is closer to be a chronicle of good and interesting practices than to represent a systematic reflection.

Besides, it must be said, eLearning issues are, relatively, a novelty in the history of humanity (deKerckhove, 1993; deKerckhove, 2006); and, even if the number of publications on this topic is enormous, it is likely to say that instructional designers still miss the big picture. As recently noticed, what European Commission calls eLearning has not really been realized, though academic institutions provide it – stressing LMS and providing theories – since long time (Davidson & Waddington, 2010; Little, 2010).

Probably, the needed discernment to have a clear framework for education today (and tomorrow) is now at the very beginning; willy-nilly, the mindset we use to interpret the role of school links to the reality of "industrial society" and to the concept of "mass standard education" (Tapscott, 2009 p.139). Some important questions seem to need a deeper analysis: In which society are we living, today? Which implications come from this paradigm of society (namely, the "knowledge society") for the educational system? Who are the learners, today, whose eLearning is (or can be) the educational paradigm? And, finally, which society is developing for the near future, in schools and on internet with the tomorrow citizens?

All the above critical questions cogently link to the dichotomy explored in this first part of the dissertation; moreover, they open to the first step: why is it interesting?

1.1: Why is it interesting?

It has become common language using concepts like "smart devices" and "digital learners". Considering these two expressions put into quoted marks, anyone can acknowledge an evident chiasm: in a proper sense, only people can be smart (or stupid), while only devices can be digital (or analog).

The provocation is relevant in our discussion, since the usage of such expressions is frequent also in the field of pedagogy and eLearning.

The topic we are dealing with is considered to be a top issue – at least – within three communities: professionals of education, especially school teachers; scholars and professors at universities, or working for public research institutions; experts (and sellers) of new media.

The first group struggles with the problem(s) of a didactic menaced or enriched by digital technologies.

The second group is asked to provide solutions to the disalignment provoked by the massive permeation of ICTs in every aspect of life except education.

Finally, people in the third group aim to build a proper eLearning, which could help the teachers, convince the pedagogists, and, above all, address learners' pedagogical needs.

For all of them figuring out what is the relationship between learners and new media is crucial. The amount of interest can be easily checked: how many papers, texts, conferences, and workshops discuss this topic? How many people work in international research institutions to narrow the best perspective on the topic? They are almost uncountable, and growing day by day.

Of course, the topic is not important just because many persons are involved. Rather, this is *scientifically* interesting because it relates to two important spheres of modern life: the future of education – and the idea/theory behind –, and the choices in public policies.

The present dissertation is intended to offer a contribution focused on, and starting from, the learners' perspective on the topic. Specifically, learners of university institutions in Ticino. In order to contribute with a valuable and original piece for the interesting whole, the research addresses the learners' perspective taking profit of the previous debate.

One *caveat* have to be considered coming from the studies about methodology (Bezzi,2001; Bailey,1995).The cutting edge, when a research engages directly people about their representations, is to avoid the customer's satisfaction style. In other words, the validity of a research in social sciences is well-based if researchers are able to collect information which add knowledge to the debate which is not yet clear. The "learners' perspective" must be something more and deeper than a simple "what learners say". Much better, the approach must help learners to unveil what they know – in our case – about the role of ICTs in their learning experiences.

A reference for this approach is the work done by Stevick (1982) on language learning and teaching: by collecting qualitative data from diaries to understand learners' perceptions and behaviours it was possible to achieve valuable knowledge to upgrade teaching-strategies.

In order to follow this methodological strategy, it is necessary to adopt a dialogical cross-fertilization between theory and empirical feedback. Specifically referring to the

topic of this dissertation, we will see how complex this relationship is: from the literature review it is possible to obtain (acceptable) concepts and (solid) data seriously contrasting each others. So, it emerges the need of a theoretical framework in order to re-shape and re-size what we can read about learners and new media.

There is one final point about the interest around the dichotomy learners-new media. It is important, on one hand, to depict the novelties and to provide evidences about new opening areas in education (Cantoni& Tardini, 2010); and, at the same time, on the other hand, to refuse the myth of technology, unbalancing our perspective on tools, rather than on learners (Bullen, Morgan & Qayyum, 2011).

A good example to figure out the challenge implied in this last point is the case of mobile in learning.

1.1.1: The growing attention to informal: the case of mobile in learning

During last years the so-called mLearning (standing for *mobile learning*) gained a great visibility and diffusion. In this paragraph we will shortly describe it, explaining why this is a good example of the typical controversies implied in digital experiences of learning.

1.1.1.1: What is mLearning? Why does it absorb so much attention?

It is possible to identify two main areas for the deployment of mLearning. The first one follows a top-down process and it is the adoption of mobile devices for learning/training purposes by institutions; e.g.: exercises of self-evaluation sent to students' mobile devices after a lesson to check the achievement of learning goals. The second one concerns the exploitation of the already existing practices with mobile devices enlarging them to/within learning scopes; e.g.: adopting Twitter® style of communication in school lessons.

The great attention around mLearning is mainly due to the almost universal diffusion of mobile tools, and the constantly growing familiarity with related technologies and possibilities. In reality, we know that access to ICTs is not anymore an issue: almost 95% of young Swiss reported in 2006 to frequently use a computer at home(OECD-

CERI, 2010b, p.80); and, in 2008, in Switzerland there was about 1,2 mobile phones per capita (p.86).

The growing practice provoked a growing attention, which is the basis for the diffused great feeling of importance of mLearning. Furthermore, over the last few years, the first generation of "truly portable ICT" – with the advent of mobile devices that provide telephone, Internet, and data storage and management all in the same, small object – have come about (Peters, 2007). Together with their technical improvement, an enormous growth in their adoption has been registered: A recent survey by the Pew Internet & American Life Project (Rainie & Anderson, 2008) even predicts that by the year 2020, most people across the world will be using a mobile device as their primary mean for connecting to the Internet.

1.1.1.2: The relevance of mobile in learning

Within a society where mobility is ever more relevant, mobile technologies respond to the need of contextualized and just-in-time content delivery(Rapetti, Vannini & Picco, 2011).

Coherently, the increasing popularity of mobile technologies and their new technical possibilities not only have created new opportunities for the delivery of distance learning, but they have enabled the so-called "situated learning" or "learning in context" (Peters, 2007).

The literature presents a constantly increasing number of studies on the use of mobile devices, both for formal and informal purposes, within the walls of educational institutions, as well as to broadcast literacy in deprived areas.

Scholars do not converge yet around a unique definition of mLearning. Nevertheless, they mostly agree on the fact that mobile learning currently exploits mobile telephones, handheld computers or similar devices, which draw on the same set of functionalities (e.g., smartphones, PDAs, Tablet PCs, Netbooks).

To sum up the status of reflection about mLearning, we could agree on the following characteristics commonly recognized:

- Learners are on the move, they move physically but also in other ways, for example among different devices, in and out of engagement with ICTs, and over time (Sharples, Taylor, & Vavoula, 2005);
- The nature of mLearning is ubiquitous (*idem*);
- It is essentially contextual and suited to support context-specific learning (Abowd, Atkeson, Hong*et al.*, 1997; Botha, Vosloo, Kuner*et al.*, 2009; Traxler, 2009; EDUCAUSE, 2010);
- It is situated and suited to support location-based services (Botturi, Di Maria, & Inversini, 2009; Traxler, 2009);
- It supports augmented reality(Scanlon, Jones, & Waycott, 2005; EDUCAUSE, 2010);
- It is also mainly personal(Peters, 2007; Traxler, 2009; EDUCAUSE, 2010);
- It is immediate (Scanlon, Jones, Waycott*et al.*, 2005; Traxler, 2009);
- A vast amount of it takes place outside formal learning situations (Sharples, Taylor, Vavoula *et al.*, 2005; Traxler, 2009), although recent examples demonstrated that it can also be capitalized in formal academic settings (EDUCAUSE, 2010).

All these characteristics (everywhere, every time, contextuality, augmented, immediate) are only few advantages that mobility carries with it in learning.

1.1.1.3: The consequence of mLearning within reflections about eLearning

Considering pros and cons (for a more in depth discussion, see: Traxler & Kukulska-Hulme, 2005), mLearning seems to be an extremely powerful way, which, though, has still not been enough exploited for its peculiarities. Mobile devices request a proper instructional design by institutions before being adopted to serve for eLearning purposes, since mobile devices do not make a difference *per se*. Last but not least, teachers' training stressing mobile learning is likely to be the cutting edge for the success of the initiative, a point that needs to be seriously taken into (more) account.

Likely, the next version of digital gap will divide the ones who are able to adopt ICTs with adequate skills to face the complex learning needs of the knowledge society, and

the ones who do not. An example of that: using the free time spent travelling playing with a PSP, or using the same device to listen to a podcast of a missed lesson or to do self-evaluation exercises. As if to say, we still need some reflection about how to transfer digital skills and practices from private life and leisure time, to formal learning context.

What said about mLearning can be extended *mutatis mutandis* to the whole context of eLearning.

Weaknesses of mLearning underline that it is not enough to choose a mean with great potentialities and which is (almost) of universal use, in order to obtain a new pedagogical paradigm. Furthermore, it seems to be pedagogically and strategically weak to consider the digitalization of teaching an unquestionable *a priori*.

1.2: Why is it urgent?

The reflection concerning the role played nowadays by new media in our society (hence in learning) requires a lexical clarification: the distinction between emergency and urgency. It is recommendable to deepen such clarification (for a discussion, see Rapetti, 2004, pp. 31-32) considering the etymology of Latin verbs 'urgere' (to press, to drive) and 'emergere' (from 'e-' out, forth + 'mergere' to dip).

In pedagogy, it should be better to adopt the concept of urgency (meaning a condition/situation/problem/case that needs to be carefully considered as soon as possible), instead than emergency. In fact, when we think about emergency, we implicitly consider reacting with extra-ordinary decisions and actions. The mindset refers to catastrophes. But, education needs to be considered as a long-term process, in which it is preferable to build on ordinary and planned activities as much as possible.

Moreover, we can consider that the urgency is related to processes, while the emergency relies to punctual facts. An example of such distinction is the following. It is an emergency if I get a car accident, while it is a matter of urgency if every morning the warning light of the temperature shines, even to the point to break the car's engine. In the first case I am legitimate to call for a taxi – an extra-ordinary solution. On the

contrary, in the second case I can adopt a number of solutions before to destroy my vehicle by my own.

The greatest difficulty in human and social sciences is to recognize, identify, and figure out which are the warning lights and what they mean. According to such vision of "urgency", a reflection about learners and new media is urgent because: firstly, it concerns a process, and it involves many other processes; secondly, this dichotomy needs to be carefully considered as soon as possible because a comprehensive perspective over the topic is still missing, and the arousing voices falsify each others; thirdly, it involves either the specific area of eLearning, and the general comprehension of everyday life of learners.

1.2.1: Why is such a topic urgent for eLearning?

Reflecting on learners and new media is particularly urgent in the area of eLearning also because of the arousing voices claiming that eLearning – as it should be – is far to be realized.

Some critical reflections come from the still existing gap in higher education between students and teachers/lecturers in ICT familiarity-level. A study from Association for Learning Technology (ALT) showed that about one of five UK students thinks their lecturers should receive more training; what the research pointed out is that it is fundamental to equip people with didactical skills in order to "highlight the ways in which they can enhance their teaching rather than simply being seen as a burden"(CHECKpoint eLearning, 2010).

Canadian scholars Davidson and Waddington go in depth in the debate, critically asking "whether eLearning is keeping its promise of delivering a more authentic education that will permit learners to develop higher-order thinking processes that will open new learning possibilities"(Davidson & Waddington, 2010, p.2). One of their main concerns comes from the different pace of ICTs adoption; while the market pushes for a rapid technological innovation, university institutions have to arrange educational needs with the technological trends – and they seem to be "forced" to adopt a new paradigm. In this

gap, it is hard to discriminate which is a thoughtful use of ICTs for learning purposes: on one hand, we register that "there are 400 million active users who spend over 500 billion minutes per month on Facebook"; on the other "we use content management or learning management systems [...] often [as] mere receptacles that allow for the posting or download of documents" (*idem*, p.3). Furthermore, authors explain how the hopes tied to a wise use of Moodle are still largely unfulfilled, and it is "most often to post .pdf, .doc, and .ppt documents". Besides, it is underlined that "using technologies merely because they are supposedly innovative or because they are made available by the institution is unlikely to improve student learning" (*idem*, p.7). Finally, authors advice to adopt a conception of eLearning which is meant to reduce the distance between the experience of technology in everyday life and within the educational context.

On the other side, it is perceived the need of outlining some guiding principles for technology in learning – especially at the institutional level, in order to promote standardized educational policies. On this purpose, the attempt promoted by the Ontario's Distance Education & training Network (funded by the Ministry of Training of Ontario) is very valuable and quite exhaustive, even if not definitive. According to their vision, ten guiding principles must lead the adoption of technology in education:

1. Adding value
2. A pedagogical focus
3. Quality
4. Sustainability
5. Access
6. Scalability
7. Sharing
8. Choice
9. Continuous, lifelong learning
10. Customization (Contact North, 2011, pp.6-10).

1.2.2: Effects of connectedness: the problem in its global complexity

A sound reflection concerning learners and new media is urgent because everyone, especially the youngest, are always connected through digital devices to other people, to contents, to the net, or – at least – they are in stand-by connection thanks to communication facilities and tools. Such reality provokes a hot debate around the effects of massive ICTs usages (especially) on young people. OECD report (OECD-CERI, 2012 - forthcoming) uses the term "connectedness" to describe the condition of learners and ICTs; due to the fact of being (potentially) connected every time and everywhere.

Endless connectedness has relevance beyond the boundaries of didactical reflection: there are urgencies – involving educational and communicational processes – asking to be interpreted and solved thanks to the contribution of many disciplines.

Six areas are particularly affected by connectedness and almost each of them presents either positive and negative effects. They are: entertainment, information, knowledge & learning, social, psychological, and health.

For all the areas, the table nr.1(elaboration from OECD-CERI, 2012 - forthcoming)puts in light a panorama of effects.

To get a prospect of connectedness, it is necessary to abandon two not-useful behaviours and feelings: the demonization, and the uncritical fascination of technology.

Respect to the goal of this dissertation it is important to say precisely that ideological interpretations of the above are in clear contrast with a pedagogical wise perspective.

Any critical aspect (be it positive or negative) must be taken into account, without hyper generalise it. This is why a question is provided for each area, in order to show the internal controversy of all the items, and to suggest that a non-univocal attitude is necessary to comprehend the debate in terms of urgency, rather than adopting the emergency-style approach.

Tab. 1: panorama of connectedness' effects

Area	Critical question	Effects
Entertainment	addicted, adapted, or evolved players?	- Videogame risks - Positive effects (learning by playing)
Information	a lot of things to say and read, or too many?	- Information freedom and overload - Not simple "consumers" anymore
Knowledge and learning	emerging, everlasting, or reshaped issues?	- Digital literacy - Plagiarism issues - Poorness of sms/chat language
Social	digital socialization or socialization through digital tools?	- Safety - Different experiences of socialization - The growing importance of social web - Cyber-bullism and online flaming - New ways to live/perceive the time
Psychological	are there novelties in motivation?	- Youth emancipation - Self-building
Health	does it hurt or does it scare?	- Physical problems of posture - Loss of vision - Eating disorders - Mind-conditioning - Change of the sense of reality

1.3: Why is it relevant to understand the dropout phenomenon?

Despite the great consideration on it, eLearning encountered a significant number of troubles and obstacles. The most challenging problems are: the ambiguities in teacher training, the lack of an e-didactic and a related pedagogical theory, the high dropout rates in vocational training, a non-enthusiastic acceptance in universities by students (for a

discussion of such problematic topics, see: Ananiadou & Claro, 2009; Bullen, Morgan & Qayyum, 2011; Frankola, 2001; Rapetti, Cantoni & Misic, 2009).

Among them, one of the most complex is the dropout phenomenon, defined by Frankola (2001) the real Achilles' heel, emphasising how crucial it is to identify the causes. Valuable researches explored the topic in vocational training field (Succi & Cantoni, 2008; Bachmann, *et al.*,2010), and the importance of a positive(mind-)set for instructional design was remarked.

One valuable approach to deal with this issue moves from the realisation that eLearning needs eDidactic and eIstructional design (D'Angelo, 2007; Schmoelz& Payrhuber, 2010).Moreover, it is useful to distinguish between problem setting and problem solving, without overlapping them: in a digitalized society, the digitalization of learning is one (crucial) variable of the problem, but not the problem itself.

The contribution of the present dissertation to such topic concerns the so-called generational theory.

The starting point for our investigation is the statement that, in the past decade, a constantly increasing attention has been devoted to the *digital learners'* phenomenon in instructional design handbooks and academic papers (Junco &Mastrodicasa, 2007). The main focus is on the relationship and differences between "digital natives" (Prensky, 2001), aka "generation Y" (Howe & Strauss 1991), "net generation" (Oblinger & Oblinger, 2005) or "new millennium learners" (Pedrò, 2006) and the previous generations.

The research literature indicates that the approach to information and media is very different for these two groups – how does this impact learning in higher education and during one's professional life? A key issue in adoption – and potentially in drop-out rate– isthe difference in the media environment experienced by young learners in informal (e.g., leisure, entertainment) and formal (e.g., university, work) settings

Hence the relevance for the dropout phenomenon. If there is a generational difference in ICTs' adoption, consequently, there is a connection between age and eLearning dropout.

So, it becomes a critical step to realize whether the generational gap is a matter of fact in ICTs' adoption, in order to understand if it is necessary/legitimate to focus on that variable to prevent eLearning dropout.

Moreover, in the last few years critical voices arose, questioning the "digital learners approach", asking for a more sound pedagogical reflection, empirical contextualized researches, and rejection of undemonstrated hypothesis and assumptions in learning theories (Schulmeister, 2008; Bennet *et al.*, 2011).

To clearly show the assumption, in short, it is:

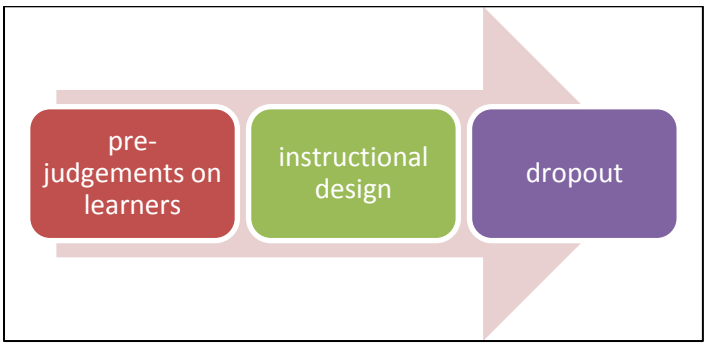


Fig. 3: how understanding learners helps to understand dropout phenomenon

Dropout is a phenomenon, one of the causes is what can be wrongly set in the instructional design phase, orienting it correctly it is possible to positively influence the learners' persistence in courses.

Evidently, this is conception of the causes of dropout narrowed on the specific topic of this dissertation. And it has to be highlighted that, in a more general perspective, instructional design is one of the issues concerning how learners are supported generally and how instructors connect with their students

If the above can be reasonably acquired, this dissertation is meant to frame such reflection concerning the (peculiar case of) learning with ICT. Hence:

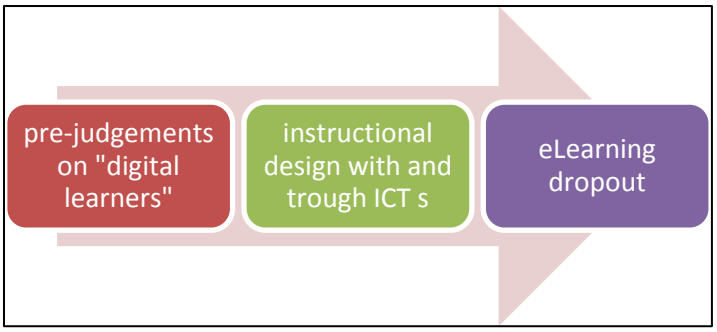


Fig. 4:how understanding “digital learners” helps to understand eLearning dropout

Chapter 2: A theoretical framework to set the topic

A preliminary warning. The chapter is devoted to expose what references have influenced the elaboration of the theoretical framework behind this dissertation. It is a sort of hermeneutical exercise which does not serve – directly – in function of the second part of the thesis, but that is considered to be relevant for reasons of intellectual honesty.

The first paragraph explains the hermeneutical reasons for such a chapter, and explains in depth why the thesis is provided with an interdisciplinary attitude. Indeed, the dichotomy learners and new media involves many disciplines, and different disciplinary approaches and related methodologies.

In paragraph 2.2 contributions coming from four disciplines – namely: Communication Sciences, Pedagogy, Sociology, and Anthropology – are presented and organized in order to build a theoretical framework. A key-question represents the fil rouge in approaching this corpus of knowledge: "which idea of learner must inspire us and have we to promote, when we set and provide eLearning?".

Paragraph 2.3 includes the in-depth analysis of the references mentioned in previous one.

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- Cantoni, L., Rapetti, E., & Tardini, S. (2010). Generation Y and "glocal" working. In B. Bertagni, M. La Rosa & F. Salvetti (Eds.), *"Glocal" working. living and working across the world with cultural intelligence* (pp.252-272). Milano: FrancoAngeli.
- Rapetti, E. (2007). *La valutazione nell'ambito della Media Education.* (Unpublished Master's Thesis). Milano, Italy: Università Cattolica del Sacro Cuore.

2.1:Looking for a theoretical framework as an hermeneutic need

This chapter constitutes, in a sense, an interruption in the flow of the dissertation. In fact, it is meant to answer to a ethical need, that is illustrating which are the cultural references I adopted in my perspective. Indeed, it is a commitment of intellectual honesty, rather than being a description showing how the doctoral research took place. Likely, such declaration of my *a priori* theoretical basis is more a personal need than a reader requirement. Consequently, the core-message of the chapter is reported in paragraph 2.2, and the third paragraph simply deepens such contents in order to unveil my readings and interpretations of what constitutes the theoretical framework.

The reason behind this chapter comes from the Gadamer lesson concerning the dialectic procedure in the hermeneutic process (Gadamer, 1976). Any research in human and social sciences aiming to offer a development of the reflection on a subject passes through a system of interpretations – especially if such research might have empirical consequences – which influences the methodology. According to Gadamer, this pre-comprehension – if explicated – is not inconvenient, rather it is expected to be an enrichment. A human/social scientist works as an interpreter of ideas, with the duty to unveil the hidden and the unsaid.

Moreover, the above *caveat* is particularly relevant in the field of education, a science intrinsically devoted to transpose the theoretical reflection into practice (see: Flores d'Arcais, 1987, pp.1344-1349).

In short, such hermeneutic exercise on my pre-comprehension over the topic of the dissertation does not serve – directly – in function of the second part of the thesis, but it is a consequence of the fact I am a humanist, a pedagogist.

2.1.1: The reason why a (interdisciplinary) theoretical framework is needed

The dissertation is built in order to offer a consistent, coherent and comprehensive vision about learners and new media. Due to the scattered nature of such topic, a theoretical framework is needed in order to decrypt what comes from the literature review. So, the

discussion is enriched by the contribution of four different disciplines, namely Communication Sciences, Pedagogy, Sociology, and Anthropology.

Offering a structure serves to order and frame the subject. In addition, clarifying the theoretical framework is an act of transparency: the reader has the chance to know which are the references considered to be fundamental by the author.

The interdisciplinary theoretical framework behind this dissertation is meant to overcome a *naïf* view of the discourse: the goal is to understand why and how the diffuseness of digital is affecting learners' everyday life, rather than simply accept or refuse the idea of a digitalized generation of learners. The key-question that emerges from this chapter is "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?"; any presented reference will serve to find the complete answer.

2.2: The theoretical framework in a schematic view and the consequent key-lessons

The theoretical framework can be schematically understood thanks to the following image; it shows the four disciplines converging in this dissertation, highlighting which are the contributions (both theories and authors) which have been identified to be relevant in the hermeneutic process.

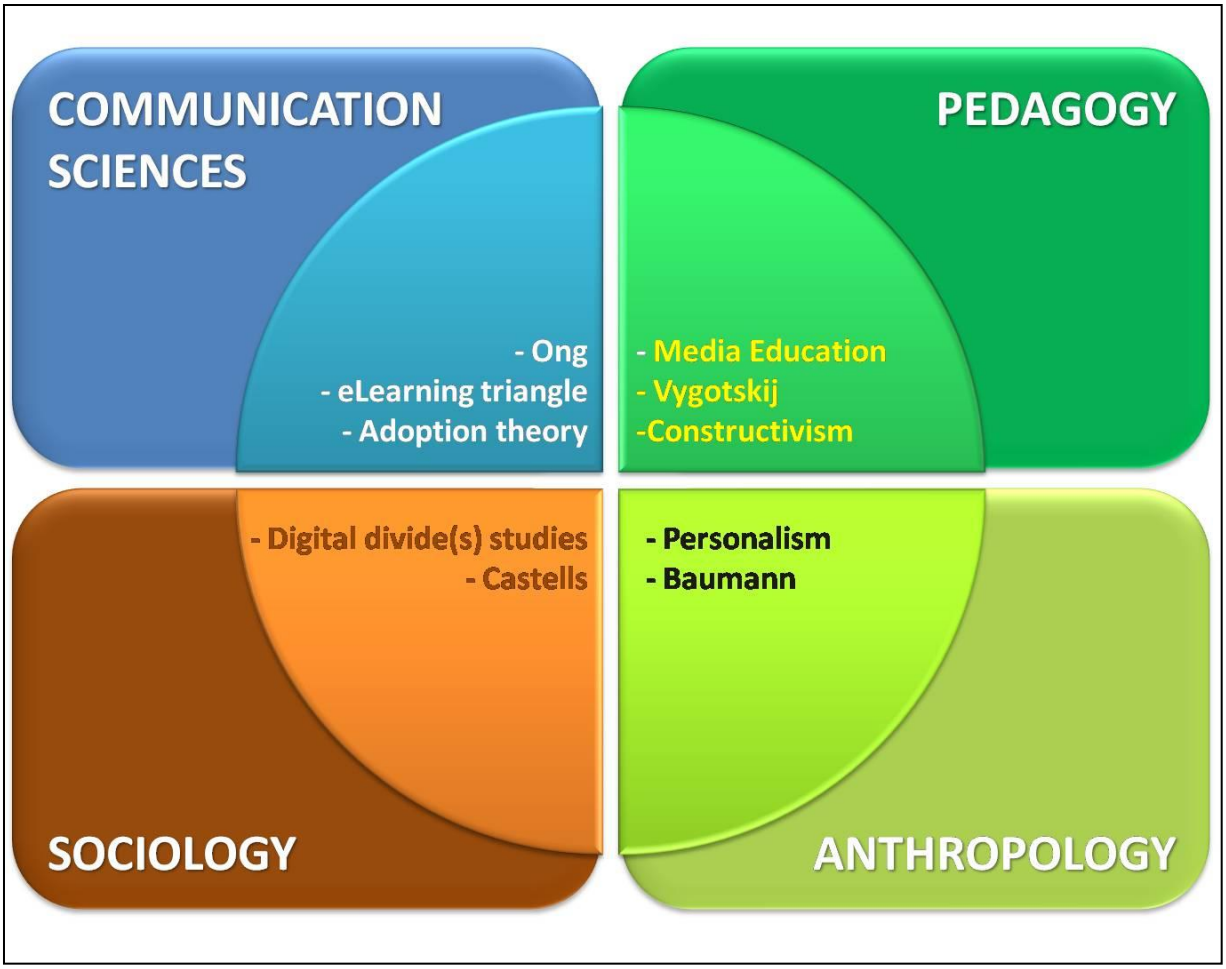


Fig. 5: interdisciplinary in this dissertation: involved scholars and currents of thought

Moving from my pedagogical background, I believe that the idea of learning we have in mind has a direct impact on the type of learner we are training, teaching, or educating. So, I identified one key-question leading the analysis of each contributions of the theoretical framework: "which idea of learner must inspire us and have we to promote, when we set and provide eLearning?". Coherently with the aim of the chapter, it is an ethical question, which concerns practical reasons. The next schema summarises some answers coming from the chosen references.

Tab. 2: theoretical contributions inspiring this dissertation

Theory		**"which idea of learner must inspire us and have we to promote, when we set and provide eLearning?"**
Communication Sciences	Ong's "second orality"	The reasonable existence of a new form of communication requires to develop new forms of didactics, able to respond to new dynamics in communicating. The objective is not to substitute, rather to integrate, the classical concepts of orality and literacy.
	Rogers' Adoption theory (+ media appropriation)	The rate of adoption must be investigated, individually analysing the different communities of potential adopters of eLearning. It is necessary to not superimpose the diffusion of innovations with the speed of development of human habits (especially in education). We must be aware that, at the end, adoption is a social phenomenon but what influences communication and learning styles are the individual processes of appropriation.
	NewMinE Lab's Triangle	This approach asks us to balance among the three vertices of the triangle of instructional design (persons, methods&tools, contents&goals). In light of that, we should refuse the faith in means and any deterministic drift
Pedagogy	Media Education	The approach of media education is an useful way to overcome the opposition between education and communication mediated by technologies, and it can inspire efficient pedagogical strategies. The digital context of learning can be understood thanks to the concept of media convergence; this must also become a focus in didactic. To explore effective media usages and their relevance in learning tools like media diet diaries can be exploited.
	Vygotskij	The zone of proximal development can receive many benefits from the digital environment. Learners are, nowadays, in condition to receive significant support to their performance, thanks to ICTs.
	Constructivism	The 21st century learner is an enhanced learner, s/he lives in an environment where learning processes are personalized and democratic. Digital technologies are the keystones, since they offer to the learner the possibility to become co-constructor of knowledge.

The table continues→

Sociology	Castells	In the digital environment, the learner has to learn how the "network logic" works. This is the physical and theoretical concept behind the organization of knowledge and power in the knowledge society.
	Digital divide	In the net, only the ones who are connected exist. Educational processes have to be implemented in order to fight any kind of digital unplugging and divide. The educational experiences of technologies have to offer to the eLearner the appropriate set of skills to face job market and, even more important, to exercise the citizenship.
Anthropology	Personalism (Maritain – philosopher of education)	Humans can not be understood within simplistic, determinist or instrumentalist visions. Even if they experiment the condition of *homo technologicus*, their anthropological freedom must guide the concept we have of them. It is better to refuse the pedagogical scientism, since it contrasts with the needed metaphysic foundation of education.
	Baumann - philosopher of sociology	Liquidity fragments the social action and reduces the integrity and identity of humans. Technologies which "pack in boxes" interpersonal communication can result alienating. The *homo consumens* no longer recognizes her/himself for what s/he is, but for what s/he has or would have; hyper technologization of learning can reduce a person to a consumer of digital knowledge.

In conclusion, according to Edgar Morin, we have to say that a *tête bien faite* (Morin, 1999) is the goal of any educative, formative, or training process. Current times – also due to the massive pervasion of digital technologies – ask for a reform of what we think knowledge is, and how knowledge is teachable and learnable.

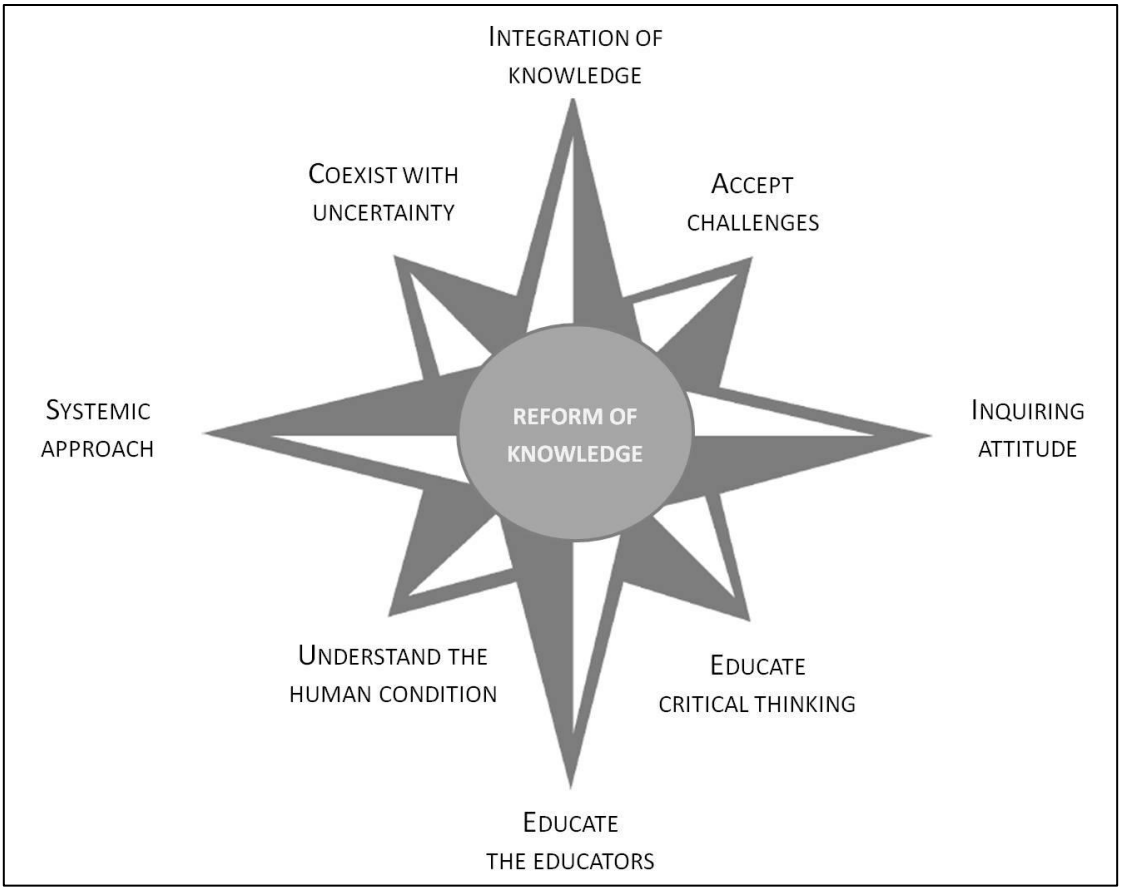


Fig. 6: the wind rose to educate a *Tête bien faite*
(Tuffanelli & Ianes, 2003, p.26, our translation)

The above picture (nr.6) shows schematically which are the key points of the reform suggested by the French philosopher. It must be underlined that ICTs are not a driver or a goal in this reform; not because technology is not relevant, rather because it must be understood like an environmental factor which permeates any aspect of education in the 21st century. As said above, in the knowledge society *digital* plays a major role, but the focus need to be kept on human beings.

2.3: Detailed presentation of contributions adopted to build the theoretical framework

This paragraph presents in details the contributions composing the theoretical framework described in picture 5. The reading offered for the following system of cultural references can be considered also like the support and motivation for me studying

education and new media; they are, somehow, like the glasses I wear when I observe the subject of this research.

2.3.1: Within the communication field

Communication Sciences applied to the field of digital learning have a great merit: scholars (re)focused the discourse in the field of human and social sciences, overcoming a simplistic perspective based only on the technical aspects of eLearning. In this sub-paragraph three voices will lead the dissertation

- Walter J. Ong, with the inspiring reflections about orality and literacy in the knowledge society;
- Everett M. Rogers, who enriches our discussion asking what can drive the diffusion of innovations
- The NewMinE Lab research team, because of the "triangle of instructional design" (persons, methods and tools, and contents).

2.3.1.1: Communicating in the digital era, what changes what does not

In his renowned *Orality and Literacy*(1982), Walter J. Ong moulded the concept of "secondary orality", describing it as "essentially a more deliberate and self-conscious orality, based permanently on the use of writing and print [...it is] both remarkably like and remarkably unlike primary orality" (*idem*, p.136). The author, expressly, described such communication phenomena like an "age" (likewise we use "era").

Briefly, his merit was to focus the reflection around the question if "writing is a technology" (*idem*, pp.81-83), emphasizing that this kind of communication (namely, literacy) has the great power to restructure consciousness in a different way from orality, since writing objectifies thoughts (*idem*, p.101), thanks to properties like: consequentiality of writing, internal coherence of concepts in a text, inter-human sharing beyond time and space constraints, etc. Furthermore, he compared the ways of communication made possible by the post-typographical media (particularly, television) and noticed a coexistence of dynamics typical both of literacy and orality: this is what he called "second orality". In his view the second orality is the paradigm of communication,

which can explain McLuhan concept of “global village” (*idem*, p.136). A remarkable point to be observed is that in 1982 Internet was not popular, even if the second orality can clearly explain communication styles typical of weblogs and social networking.

Recently, it has been pinpointed an even further step of such a process, called – after Ong’s “second orality” – “second writing”, meaning that linguistic processes of changing in the language are also at the level of written text. Indeed, the main way we use to communicate via ICTs is the written language, which is adopting the oral style and patterns. Being the language so important in the way we structure our thinking, and being internet-mediated communication so diffused in our everyday life, it is clear how this dynamics need to be carefully considered in training and teaching. A simple sms can tell us how the verbal form or the intonation - through a nonchalant use of punctation marks - contains both the oral and the written potentialities (e.g.: "R U FOOOOL?????"). The time spent in reading and correcting is considered a rare commodity in the electronic writing and people tend to get used and justify a lexicon provided inaccurately, but fast. (Renzi, 2012).

Then, the first answer to the question “Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?” can be read as follows: learners of digital era have to manage new forms of communication (what Ong called “second orality”), which do not substitute the “classical”(and tested in centuries of experience in didactics) orality and literacy, but which need to be combined with it.

2.3.1.2: Diffusion of (digital) innovations and adoption of (new) habits

The second brick helpful to build our theoretical framework comes from the “adoption theory” developed by Everett M. Rogers (1995). If the advent of digital technologies represents a novelty, it is fair to ask how (and how much) the implied innovations are predictable to spread over the society.

Rogers outlined five attributes influencing the adoption rate of an innovation and five categories of adopters. The rate of adoption is the “relative speed with which an innovation is adopted by members of a social system” (*idem*, p.250); five factors (*idem*,

pp.212-244) describe the likelihood to get a high rating: relative advantage (the perception that an innovation is better than what it supersedes); compatibility (dependent to the consistency with the existing); complexity (if an innovation is perceived as more difficult, it is negatively related to adoption); trialability (concerning the possibility to experiment the innovation); observability (the results of the innovation are visible to others).

According to Rogers' theory, five categories of adopters (*idem*, pp.261-266) are recognizable, in terms of idealtypes (and each of them owns a specific value, influencing the predisposition to innovation): innovators (venturesome), early adopters (respect), the early majority (deliberate), the late majority (sceptical), and the laggards (traditional). The distribution of adopters "follow[s] a bell-shaped curve over time and approach[es] normality" (*idem*, p.260), as shown in the following picture (nr.4).

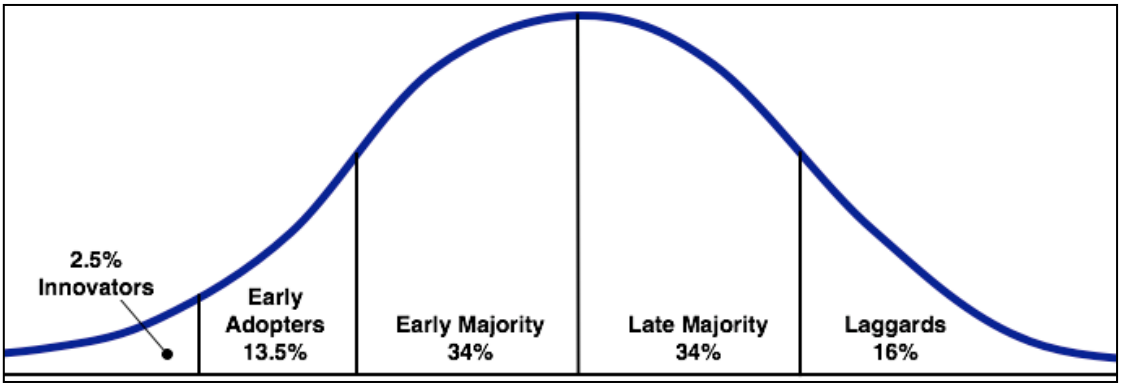


Fig. 7: adopters' categorization in Rogers' theory
(Source: Rogers, 1995, p.262)

It has to be noticed that the "classification is not symmetrical in that there are three adopter categories to the left of the mean and only two to the right" (*idem*, p.263); as if to say that the positive feelings towards innovations are more nuanced then the less positive ones. The concept of community is important to understand the adoption theory.

Rogers' theory invites us to reflect on whom we consider the authors/subjects of innovation: which are the members of a given social system entitled to adopt eLearning? When we assess the relative advantage of ICTs in education, to whom are we addressing the analysis? Besides, when we evaluate the rate of adoption of a learning platform (for

instance), who are the adopters we are observing? Such questions are critical. People in charge of educational policies, teachers, and instructional designers must be aware that in the melting pot of different communities of (potential) adopters, there are perceptions of eLearning (and, in general, of innovations in education) which might be completely different. This is a caveat against mono-directional approaches in digital learning.

There is the perception of a sort of melting of different communities of (potential) adopters, students live the eLearning adoption in different ways.

Besides, Rogers inform us about the degrees of adoption, which (in the eLearning field) is pertinent to the speed of technology evolution and ICTs adoption in didactics; but the speed of change in human behaviours and habits (such educational processes) runs according to a completely different basis.

In order to better understand the last point, it is useful to adopt the concept of "media appropriation", elaborated and deepened within the research consortium Mediappro (MEDIAPPRO, 2006) which studied the use of ICTs by young people. Once an ICT has been adopted, three dimensions shape its effective usage:

- Representations (related to the emotional en cognitive areas);
- Attitudes (related to what people is able to do, or think to be able to do, in particular situations);
- Uses (what they actually do).

According to Mediappro, "there is no dominant variable that can be said to determine the appropriation, and it seems that the appropriation process develops in an original way for each person, due to a non-predictable combination of the following elements:

- The nature and intensity of regulation exerted by the parents
- The motivation, often driven by the meaning of a use or its generalised appropriation among peers
- The technical and communication skills
- The availability of time
- The technical and ergonomic quality of access

- The information activity of the other media
- The socio-cultural context of the young person" (*idem*, p.17-18).

Also this second brick of knowledge helps us to answer the key question "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?".Some lessons need to be learned: the rate of adoption must be investigated separating the different communities of potential adopters of eLearning; it is necessary to not superimpose the diffusion of innovations with the speed of development of human habits (especially in education); we must be aware that, in the end, adoption is a social phenomenon but what influences styles of communication and learning are the individual processes of appropriation.

2.3.1.3: What does matter in digital contexts of learning?

Digital technologies create (or better, re-create) contexts of learning where collaboration has a remarkable importance. As Wenger and colleagues noticed (Wenger, McDermott, & Snyder, 2002), in order to better manage knowledge, in a world where information can be everywhere thanks to ICTs, the role of the community is critical. Besides, it is necessary to overcome the idea of learning as a simple transmission of contents and skills; actually, learning needs to be organized – of course – but also shared, and "practiced"; this new mindset of educational dynamic takes into account the complexity implied in learning today, but also it makes this complexity more complex (*idem*, p.157).

2.3.1.3.1: Why is it more than a pedagogic-didactical issue?

It is possible to face eLearning from many different perspectives. According to NewMinE Lab's researchers (Cantoni *et al.*, 2007), it is crucial to overcome a vision narrowed only on technical aspects. Even if it is evident that eLearning can not exist without properly setting the "e" part. Indeed, eLearning has to be considered with the same mindset used for learning in general. As shown in the following figure, instructional designers need to keep into account three milestones:

- the person, both in terms of the individual who learn and of group of people interacting in the learning and teaching arena;
- contents and learning goals,
- methods/strategies and tools.

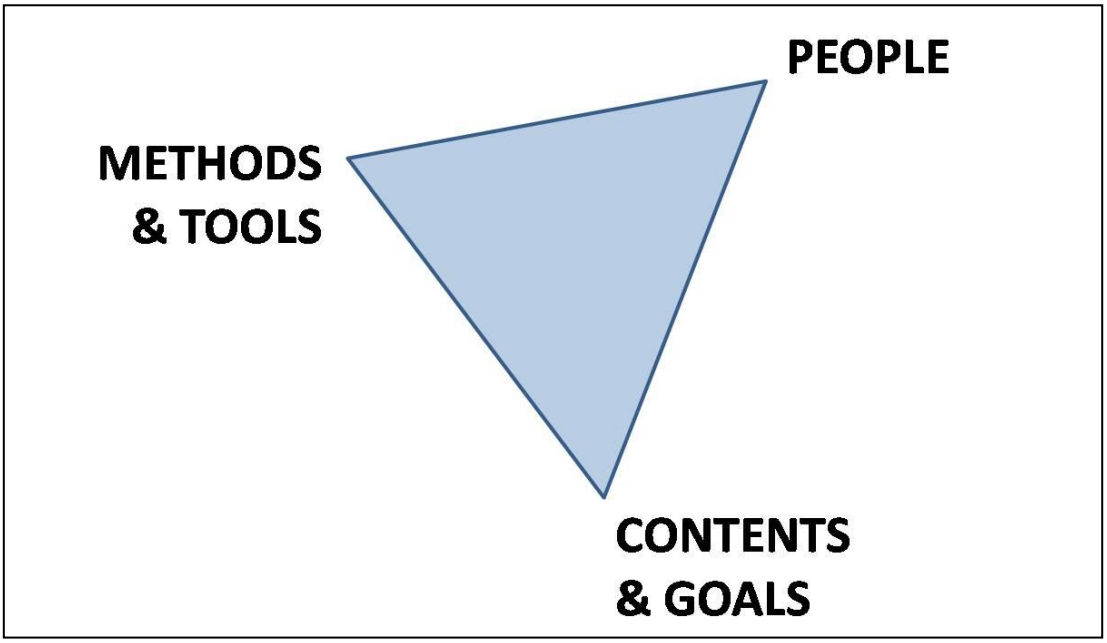


Fig. 8: the three milestones of instructional design
(Source: Cantoni *et al*, 2007)

According to this vision, it becomes clear that the technical aspects of eLearning are only one variable in the whole learning system. As if to say that mechanical, practical, and procedural issues can be considered like an unquestionable *a priori* of the pedagogic-didactical predisposition. Which is, all in all, just one third of the instructional design condition. This condition must be considered like a dynamic relationship, which needs to be contextualized in given specific contexts. Then, reasonably, universal recipes for professionals in the field of eLearning seem to be inappropriate, and the educational process has to be faced case by case.

It can occur that instructional designers and technicians devote most of their efforts to avoid all the weaknesses coming from issues such as limits in connection, problems of access to ICTs, obstacles in mastering technologies, etc. Of course they have to solve

those instances, but the complexity of learning processes asks for a broader view, refusing a sort of deterministic drift (Cantoni, Rapetti, & Tardini, 2010).

The triangle of instructional design proposed by NewMinE Lab researchers is chosen in this dissertation because of its efficacy. The three vertices represent milestones of any didactical process, and should inspire any teaching strategy; hence eLearning is not excluded. Rather, the triangle asks to be (even more) careful with the non-technical aspects.

In the light of this discussion of what matters in digital contexts of learning we can add another piece to our theoretical framework. "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?".First, eLearner is a learner. Secondly, it is necessary to keep the weight balanced among the three vertices; which asks for a methodological customization of contents for the addressed learning cultures.

2.3.2: Within an educational-pedagogical reflection

In this sub-paragraph devoted to the contribution of pedagogy we will discuss why Vygotskij and the current of constructivism are essential references in the field; then, we will see how the approach coming from Media Education can be considered as a valid solution for the didactical controversies we are facing.

As a premise, it is necessary to solve a linguistic ambiguity about the word "pedagogy". In fact, in English "pedagogy" is used both to refer to pedagogy, as science/theory of the education; and to refer to didactics, and to teaching practices in general. In this dissertation, only the first meaning is adopted.

2.3.2.1: Valuable contributions supporting eLearning

2.3.2.1.1: The ZPD by Lev Semenovich Vygotskij

It has been recently noticed that, among the most quoted thinkers in recent educational conferences' papers, Vygotskij (Russian psycho-pedagogist, 1896-1934) leads the field (Cantoni & Rega, 2003). Especially, Verenikina reported that:

> At the 2008 Ed-Media conference, a list of most often cited papers in Ed-Media 2004-2008 was revealed […].Vygotsky's theoretical work, originally published in Russia in the 1930s, came top of the list by a large margin.[…] It is argued that an effective use of modern educational technologies calls for the use of advanced pedagogies. Vygotsky's theory provides a profound understanding of teaching and learning that reflect the complexity of social and cultural contexts in the modern learner. The most frequently used concepts of Vygotsky's theory are re-visited in relation to the research into new educational technologies (Verenikina, 2010, p.16).

Beyond the anecdotal information related to that specific conference, it is interesting to understand the growing attention towards the Russian psycho-pedagogist in the twenty-first-century research (Cantoni & Rega, 2003).

The definition of ZPD is:

> The distance between the actual development level as determined by independent problem solving, and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotskij, 1978).

In other words, ZPD can be explained as the measure of the distance between independent and assisted performance; the higher is the support, the greater is the area of ZPD, and therefore, performance is higher. As if to say: the more assistance the teacher can provide, the better the learner can perform; both in terms of knowledge achievement and in skills development (Vygotskij, 1929; 2011). A wise and customized use of ICTs may empower remarkably such dynamic. The next picture (nr.9) shows how, increasing the ZPD, the learner's performance increases along.

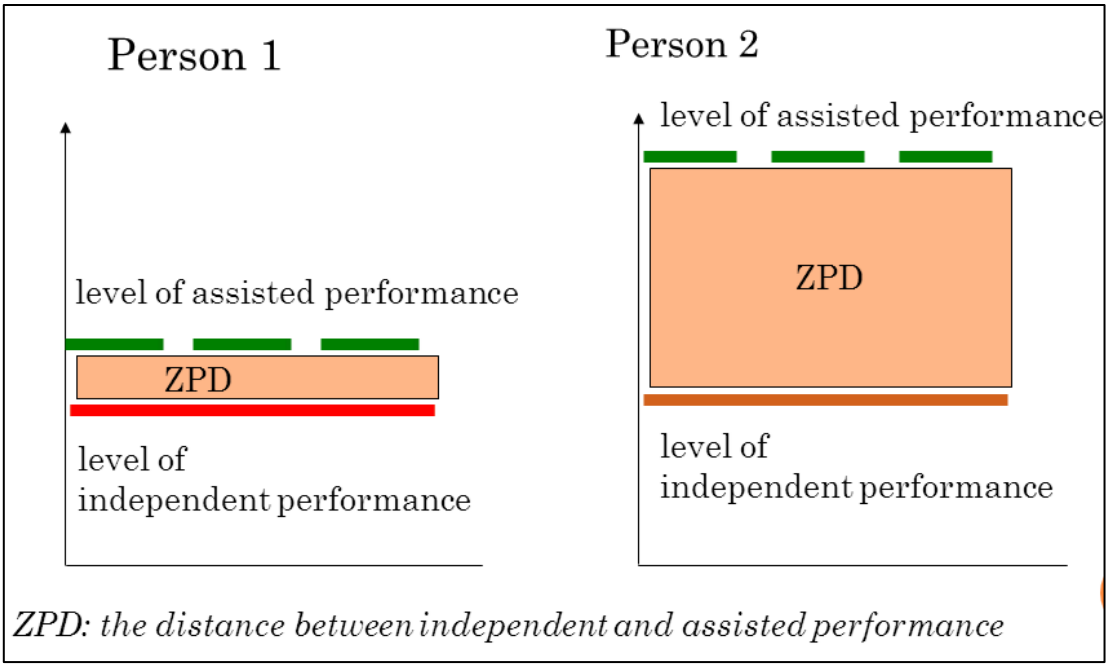


Fig. 9: the zone of proximal development
(Source: Verenikina, 2010)

Remarkably, learning opportunities offered by ICTs have the great chance to support and enlarge ZPD (potentially) without any time/space constraints. At the same time, this multichannel and multifaceted learning environment becomes more complex, because of the increasing of didactical variables to keep under control. ICTs amplify the issues in current teaching practice, since internet challenges what is the knowledge we teach in schools and universities, and digital means transform the nature of communication in teaching and learning process. The paradigm of "orchestration" constitutes an answer to this issue:

> The notion of "orchestration" refers to the teacher's activity in managing the flow of activities across different social planes (solo, group, class). In CSCL scripts, the orchestration is partly offloaded by 'macro-scripts' which manage this flow of activities (Alavi, Dillenbourg, & Kaplan, 2011, p.19).

Concluding this analysis about Vygotskij, we can agree that:

- The mere availability of technology did not result in any substantial change in terms of teaching practices. Indeed, new technologies call for advanced pedagogies to ensure their effective use.
- The theory of Vygotsky, which has gained an increased popularity in the past three decades, provides a rich, comprehensive and well established framework [...].
- A number of prominent leading theoretical perspectives which stemmed from the theory of Vygotsky provide a wealth of ideas and approaches to support and substantiate such pedagogy (Verenikina, 2010, p.23).

2.3.2.1.2: The broader view offered by constructivism

The pedagogical view proposed by constructivism is the second pivotal reference to understand eLearning, either to frame it and to explain its effects on cognitive styles.

The paradigm of constructivism, or more specifically social constructivism, considers the notion of reality as a mental construct not only intra-subjective (the cognitive activity of the individual), but also inter-subjective (the system of relations and interactions with other individuals). The construction of what we call "reality" is therefore collective, and everyone participates actively. In this sense, learning is a dynamic process acted by the subject for the acquisition of knowledge, which has ontologically a social nature (Dewey,1916). It follows that teaching methods should be designed and implemented taking into account the specificity of the learners and of the given context (of social interactions): this is regarded as the foundation of learner-centred pedagogy (necessary to build a proper eLearning). So, the attention of educators must focus on interactions that support the learning process, so as to facilitate a fully collaborative construction of knowledge (Eletti, 2002, pp.40-41). Even if it must be said that such theoretical approach opens important questions for what concerns the concept of reality as it is, and it should be carefully handled in terms of hermeneutic and philosophy.

It is worth to be mentioned in this dissertation because it offers a useful approach to understand the role of new media in education, they are more than simple didactic tools, and indeed they constitute an educational *milieu*. In the learning arena permeated (even structured) by media, learners are constructors of identities, of culture, of knowledge; they become (online) co-operators of knowledge processes (Wenger, 2002). In the constructivist view, individuals build up together their (new) meanings; thanks to this idea new didactical models arose, such as the "learning communities" one (Calvani & Rotta, 1999).

On one hand, constructivism has two great merits: first, it pairs social and cognitive aspects of learning and offers a comprehensive vision of it; second, it definitively overcomes the idea of the learner-recipient (to be filled by knowledge), proposing a learner-subject, who is a committed co-author of learning.

On the other hand, it is better to scale down the big confidence put on constructivism. Primarily, because the attention is focused on the information processing of the interacting individuals, while the learning process covers a wide range of mental activities and involves several levels of conceptual organization; and this asks for broadening the frame concept. Then, without denying at all the importance of the "construction", it must be observed that this is only one aspect of learning and it is conditioned by the cognitive resources available, the type of education provided, the ideas put into play in discussions between students (Roletto & Regis, 2010, p.55). Finally, the eLearner condition of co-builder of the learning process does not meanvacancy or a *diminution* for the teacher role; rather an evolution, when applicable, to the status of "fading teacher"(O. Peters, 1993). In the next sub-paragraph we will discuss why.

It must be reported that the social constructivism is not exactly an *unicum*, it is rather a variance of models founded on the same epistemological root. What we are discussing here is exactly this common background. Briefly, though constructivism is a key-reference and we agree to consider it as a necessity in order to frame eLearning, it is necessary as well to reject a fideistic adherence to this theory.

Vygotskij and social constructivism are very important to answer our key-question "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?". According to constructivists, the 21st century learner is an enhanced learner, s/he lives in an environment where learning processes are personalized. Digital technologies are keystones; indeed they offer to the learner the possibility to become co-constructor of knowledge; besides ICTs make possible to set learning contexts strongly enhancing ZPDs.

2.3.2.2: The contribution of Media Education to frame didactical controversies within eLearning

Since eighties of the past century, the massive advent of ICTs in society made it clear a misalignment between school and life, especially referring to a (potentially enormous and constantly increasing) gap between formal experiences of learning and informal

ones. The upcoming digital environment was perceived, at the same time, as a menace or as a supporting and developing factor for the didactic reflection. Besides, the chances of achieving knowledge via non-schooling experiences immediately multiplied (Scardigno, 2009). Furthermore, following the challenging path of "deschooling society" because of the irremediable gap between school's structure and life needs (Illich, 1971), the idea that media could substitute any educational institutions became popular. According to Gonnet, for instance, new media have definitively substituted books in their role of source of the knowledge; the school remains a trainer for the use of media and a safe environment where experience to the psycho-affective dimension of media communication (Gonnet, 2001, p.6).

Because of that, the Media Education (ME) movement arose, with the aim of reducing the negative effects of this gap. Many faces and different practices of ME developed during decades and are recognizable. Valuable indications come from the Media Awareness Network, in Canada (see: www.media-awareness.ca), which offer a constant help to parents, teachers, and educators in order to bridge the gap; they offer training, materials, sharing of best practices, and theoretical reflection.

Among all the possible contributions, we refer especially to the book *Media Education* (Rivoltella, 2001), because of its synthetic (triple) definition. In general, we can say that ME aims to avoid the classical opposition between the world of education and the world of media; trying to put them in a fruitful dialogue. Therefore, we can consider it as following (*idem*, p.65):

1. Educate *to* (an aware use of) media. The goal is training the critical thinking (e.g.: questioning the socio-cultural impact of cellphone-cameras in classrooms);
2. Educate *with* media. The goal is offering and exploring didactical strategies involving digital technologies (e.g.: being filmed during a lesson and putting the video on Youtube);
3. Educate *through* media. The goal is experiencing media languages and achieving a proper media literacy (which involves the ability to product digital contents), within

formal contexts of education. (e.g.: collecting news for the school magazine through micro-interviews taken on the field via cellphone-cameras).

It is also worthy to be mentioned the work of Bevort and deSmedt, who enlarges to five the number of pedagogical approaches to media experiences:

1. *Faire / Produire des médias et des documents médiatiques.*
2. *Analyse / Déconstruction.*
3. *Enseignement des théories relatives aux médias.*
4. *Prise de conscience de la dimension psychoaffective.*
5. *Activités ludiques* (Bevort & deSmedt, 1999; elaborated in Rapetti, 2007, p.14).

In this context of reflection, it is also necessary to keep in mind Marshall McLuhan's work and, especially, his *caveat* against the neutralist approach: "the medium is the message" (McLuhan, 1964). Just to remember that in the triangle of instructional design (see fig.8) there is also the relationship between contents and tools to be faced and properly set. Certain contents look different if presented through a bullet point, an image, or an oral speech.

The most important lesson blossoming from ME has to be conceived as the corollary of constructivist approach. It is unquestionable that young learners, grown up in a digital environment, are more familiar with digital technologies; therefore, they are more confident in co-construction processes, and this can be considered to be a sort of "media competence". But this media competence is not enough: teachers and educators own the educational (and ethical) competence, even if they are not comfortable with digital technologies. Indeed, ICTs are important in educational processes not to "update" or "upgrade" teaching – as often claimed (Ward, Weston, & Bowker, 2007) – but to improve it, and when they do not improve it, they are useless.

Strictly related to Media Education studies, there are two key-concepts we can adopt: media diet and media convergence.

2.3.2.2.1: Media Diet

Based on the metaphor of diet and mimicking the *Slow Food* movement, in the last years, there is a growing attention towards the so-called "media diet". Basically it starts from the evidence that digital media permeated any aspect of our everyday life, to the extent of not being even more aware. The concept of media diet shows the strength of this influence and its internal contradictions: it is necessary to survive, people need to variegate it to get fit, it is important to know how to cook the most difficult dishes, bulimic and anorexic behaviours are dangerous for life, social relationships are – often – mediated by the assumption of food (or, the use of technologies) and so on (Cola, Prario, Richeri, 2010).

Even *Wired* accepted this concept. Based on Nielsen Company data about media usages, the magazine launched the *motto* "Balance Your Media Diet" to comment the following picture meant to show graphically the suggested media diet for American people (in order to offer a reasonable regulation for the great number of "media overdoses" reported by Nielsen study).

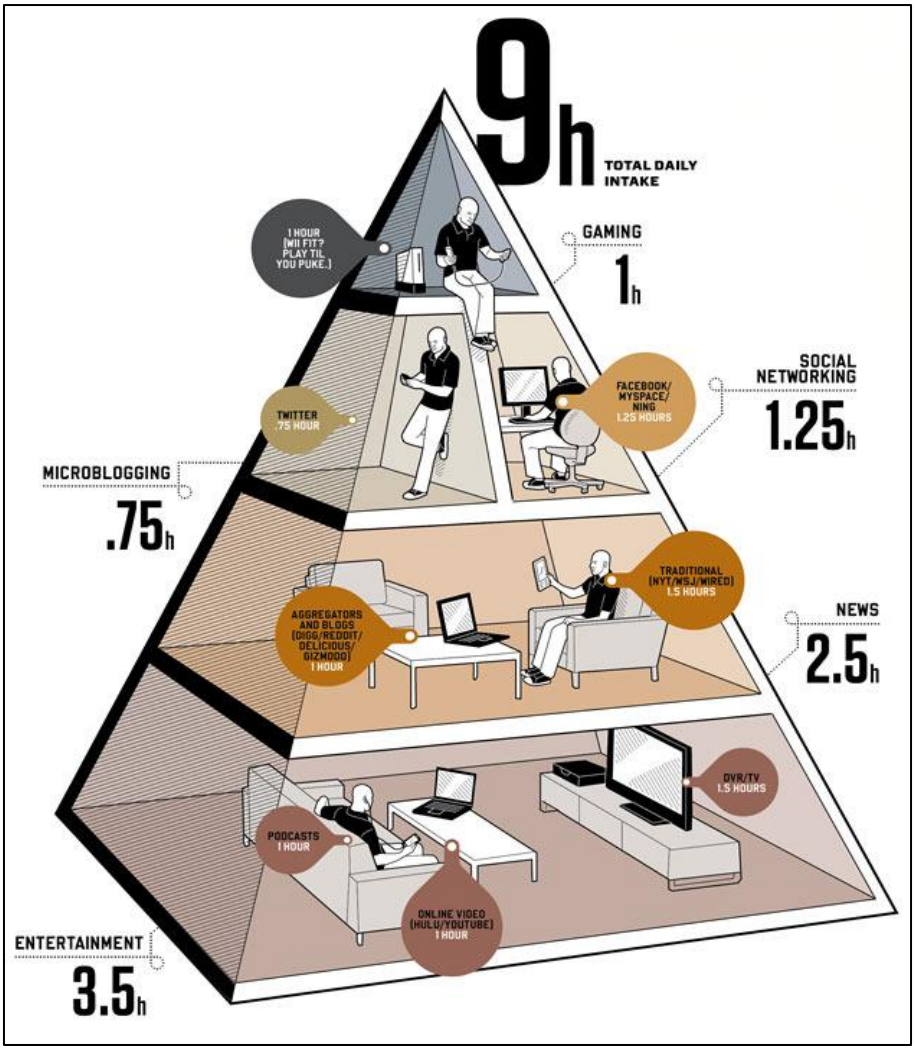


Fig. 10: "Balance your Media Diet"
(Source: Leckart, 2009)

The message proposed by Wired was: "Practicing good nutrition keeps your mind sharp, your body fit, and your life long. The same could be said for consuming media."(*idem*).

Beyond this example, what we can keep for our framework is the need to find a specific tool to analyze digital practices. Media diaries are very valuable, since they explore some intangible aspects, such as: actual media usages, the relationship between need and gratification, multitasking, which applications and facilities are favoured and exploited by users, etc.

2.3.2.2.2: Media convergence

Observing media and learners scholars realized the upcoming of the media convergence phenomenon. It is explicable according to two main meanings; one is a cognitive process, and the other is a technological and commercial trend:

- The first – convergence of digital media – is the ability developed by learners to put together many digital means and to take advantage of a new multichannel and multitasking learning environment. The skilled eLearner is able to implement a media convergence to answer learning needs (e.g: during homework eLearner surfs on Wikipedia, phones to colleagues, chats with tutors, downloads materials from university website, etc).
- The second – convergence to digital media – is the race to offer devices that are increasingly multimedia, multitasking, multifunction, and customizable. "Smartphones" resemble more and more to digital platypuses in which any previous technology must be embedded: the fulfilment of media convergence (particularly, through the development of next-generation mobile telephony) should open doors of contents and services (easily and cheaply accessible via the Internet) to mobile learners (Rivoltella, 2006, p.104).

Media convergence represents an environmental factor that underlines how ICTs bring growth and progress in learning processes. The other side of the coin is the risk of digital skills gap, especially for what concerns learning fundamental skills such as attention, narrowing, and analysis/synthesis, because of the too wide range of cognitive *stimuli* to keep under track (Jackson, 2008; Watkins, 2009). Besides, the existence of so powerful mobile tools complicates the task of parental and educators control (Rivoltella, 2006, p.104). Another effect of media convergence is the deep change in socialization aspects of learning; as well as in the communicative ones. It is a recent phenomenon in the history of schooling, but, nowadays when learners have a doubt related to their home-works, they prefer using chat instead visiting a schoolmate home. Learning is a process in which we build our "self"; it will be interesting to explore how this will be affected by the new experience of privacy; in facts digital and mobile learning lead a completely different sense of self-exposure and interaction (Boyd, 2008, p.13).

Teachers and educators have to deal with the media convergence issue, aiming, as much as possible, to train eLearners to develop this as one of the 21st century skills.

Asking for the fifth time "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?", we can answer in light of Media Education reflections.

Above all, we can consider ME like the dynamic aimed to put education in media and to put media in education, at any instructional level. In this sense, ME can be considered the goal to be pursued in order to educate eLearners (and not simply to update teaching strategies); the media convergence can be considered like an environmental factor of adaptation; and the media diet has to be understood like the analysis tool.

2.3.3: Within the sociological studies observing and describing the Knowledge Society

So far we have discussed how the presence of digital in learners' life does change their communication processes and educational experiences. We have mentioned many times how this is typical in the so called Knowledge Society. It is now almost mandatory to broaden our frame adopting a sociological view. The ponderous work of Manuel Castells will help us in understanding why and how ICTs do not affect simply the communicative and educative dynamics, but change the society as a whole. Hence the need for new paradigms to interpret human behaviours in the social *arena*. Then, we will consider what is likely to be a new form of poverty: digital gap(s).

2.3.3.1: Net-enhancing ICTs reshape time, space, and human behaviours

Industrial society, post-modern society and knowledge society (or information society) are the three steps occurred during the 20th century, according to the most diffused sociological periodization of history of the "north-western world". The first is self-explaining, it refers to the industrial revolution and describes a society based on mass production, division of labour, urbanization. The second label is the ephemeral definition meant to describe the instable condition of the post-industrial context: crisis of the previous dominant models of work, of thinking, of living. We are focusing on the third one.

The birth of the "knowledge society" concept is strictly related to the widespread diffusion of information and communication technologies: if means allowing access to information become common property, then knowledge is (potentially) achievable by everyone. Therefore, the common trait to frame that society is expected to be the knowledge itself.

In this dissertation, among a number of possible references to explain what knowledge society is, we adopt the perspective elaborated by Castells in *The Information Age: Economy, Society and Culture – The rise of the network society*(2000), because of its completeness and wide view. It seems to be the more comprehensive and explanatory of the multiple aspects involved in the discussion, among many possible definitions and reasoning.

The Spanish thinker argues that we are legitimized to state the existence of a new society (or a new historical era/age) when we face a new epistemological paradigm explaining why and how the reality is different. Then he asks the question of what makes the current society different from other/previous ones. To answer, he firstly adopts Freeman's description of the paradigm shift:

> The contemporary change of paradigm may be seen as a shift from a technology based primarily on cheap inputs of energy to one predominantly based on cheap inputs of information derived from advances in microelectronic and telecommunications industry(idem, p.70).

Secondly, he completes this claim defining the distinguishing traits of the new society. As Castells specifies, taken together, they are the "material foundation" of the network society. Not outstandingly, the core of reflection involves digital technologies.

1. ICTs are meant *to act on* information (not just information to act on technologies);
2. Since information is an integral part of human activity, the stronger effect of those technologies is *pervasiveness*;

3. Any system or set of relationship using ICTs is based on and refer to a *networking logic*. The net is a topological configuration, referring both to processes and to organizations; it is needed to structure the unstructured;
4. In a net not only processes are reversible, but organizations can be modified by rearranging their components. This is the *flexibility* (either structure and philosophy of the networking logic);
5. Due to the technological (r)evolution, we register a growing convergence of specific technologies into a highly integrated system;
6. In the net, rules are created and changed much faster, increasing significantly the overall *complexity* (of the system, of interactions, of the human action);
7. Though the net structure allows interactions among all nodes and a potentially complete freedom of communication, it works by *clusters* and it rewards who is the *strongest* and richest communicator (in a sense, the chiefs of clusters own a "repressive power" in the system);

It must be said that the above list is a synthetic elaboration of Castells' ideas; in the original text (*idem*, pp.71-74) the distinguishing traits are five, sixth and seventh have been added because are part of his reasoning to explain the paradigm shift.

Finally, the sociologist puts as corollary of his reflections the first law of Kranzberg to explain the social dimension of the revolution brought by ICTs in the society. It states that *technology is neither good, nor bad, nor it is neutral.* And it is considerable like a *force* implied by media usages, which penetrates the core of life and mind (*idem*, p.76).

The corpus of reflection about learning known as connectivism is deeply interconnected with the reflection about the network society. Siemens (2005) defines it as the learning theory for the digital age, basically claiming that knowledge exists when results from connections. In the paper defining the principles of connectivism, he argues that:

> Connectivism is driven by the understanding that decisions are based on rapidly altering foundations. New information is continually being acquired. The ability to draw distinctions between important and unimportant information is vital. The

> ability to recognise when new information alters the landscape based on decisions made yesterday is also critical.(idem,p.7).

Enlighten by the paradigm of network society, so, "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?". Above all, we must recognise that, in the knowledge society, the process to manage information changes, therefore the strategies to achieve knowledge change; because of that, learning must be considered carefully: it becomes possible through connections among many and plural nodes of information providers. Learning in the net makes different the social perception of knowledge; the presence of ICTs is not a simple technical need or opportunity, but is part of the social fabric. Concerning the aim of this dissertation, we realize that learners must be trained to surf the net, to master the connection ability and to be aware of communicative and educative implications of the networking logic.

2.3.3.2: Original experiences of social and learning: new divides

The idea that the existing society is based on the new (if compared with previous ages) technological connection among social actors, considered themselves as information sharing nodes suggests a question: are the unplugged individuals, in a sense, out of the society?

2.3.3.2.1: From the access' issues...

ICTs are the technical means allowing and enhancing the networking logic typical of the knowledge society; not only, ICTs are so permeated in everyday life to structure also the socio-cognitive characteristics of learning. Therefore, at a first reading of the problem, it is absolutely meaningful to state that the non-connected ones are out of the network, then disconnected from social action.

The above reasoning is the explanation behind studies concerning digital divides. It is enough to think about all the knowledge gaps and digital divides (Marshall, Kinuthia, & Taylor, 2009) typifying contemporary times, to acknowledge that "knowledge society" represents more a promise, a faith, and a potentiality, rather than being a descriptor of a matter of fact. Experts in the field of ICT4D (Information and Communication

Technologies for Development) refer that those gaps are evident when comparing rich countries against developing countries (Unwin, 2009).

In its fundamental definition, the digital divide can be understood like the gap between those who have effective access to information technologies (especially computers and the internet) and the ones who are excluded, either partially or totally. Possible explanations for exclusion include several variables: economic conditions, educational level, quality of infrastructure, differences in age or sex, belonging to various ethnic groups, geographic origin. Digital divide can be measured comparing individuals, and learning contexts, within a single country or globally. Nevertheless, this understanding of digital divide is being questioned by the speed of ICTs and internet diffusion (see following graph).

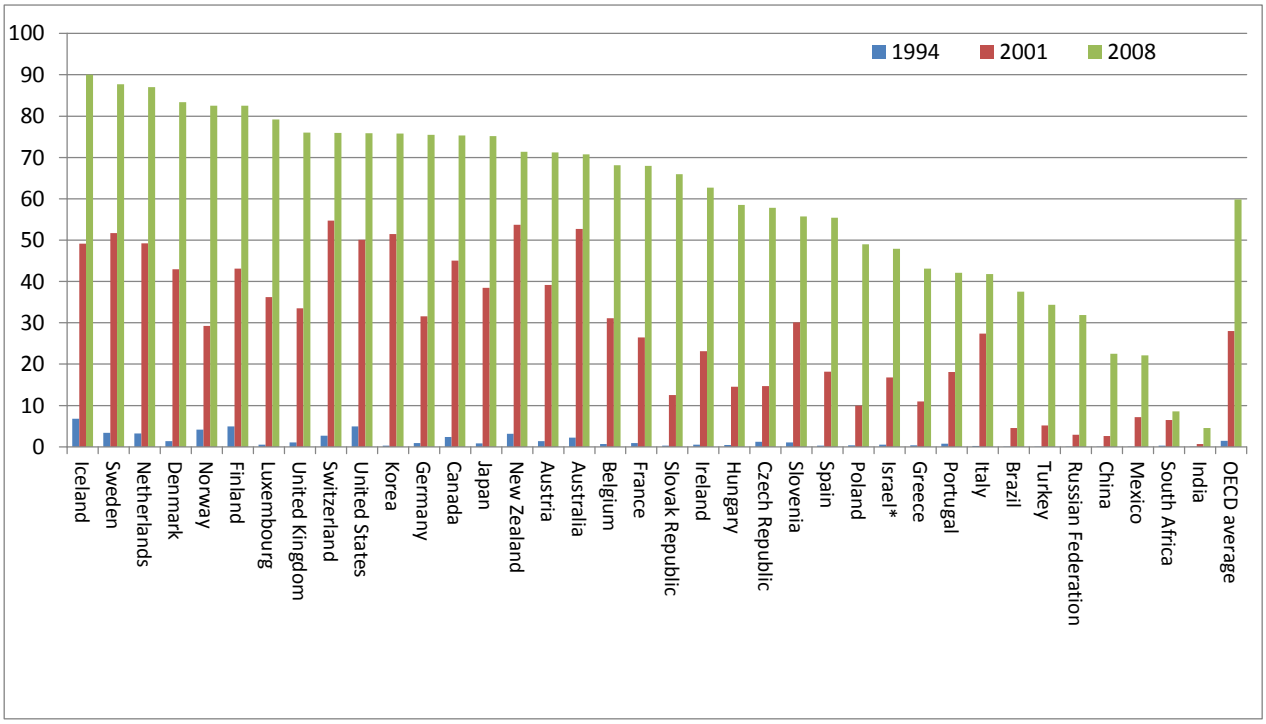


Fig. 11: towards universal internet use.
Internet users per 100 population, in 1994, 2001, 2008(our elaboration from: OECD-CERI, 2010b, p.85)

What is likely to become more relevant in order to observe digital gaps is the evaluation of differences in the acquisition of data or achievement of skills necessary to participate in society. As remarked by EDUCAUSE – already in 2001, before monopolies of access

such as YouTube, Wikipedia, Google, Facebook – "the web is not a library, and access is far to be egalitarian. This needs to be clearly understood" (Hawkins, 2001).

2.3.3.2.2: … to the new skills request

Particularly, Valiente (2010) observed that there is a considerable growth in new skills request in the job market. This challenges both educational institutions and politicians: the first ones are asked to train current learners in order to achieve "digital skills"; the second ones must elaborate long-life-learning policies and strategies allowing everyone to stay connected with the society. The discussion involves again education, this time not for didactical issues, but for social implications of educative choices; in brief, here, the question is "Must our thinking be the mindset and the abilities' toolkit of nowadays members of society?"

Skills related to digital play a major role in the corpus of the so-called 21st century skills. The debate about this topic is made more complex by the uncertainty about how to integrate the corresponding 21st century literacy, in school and university curricula.

In our discourse 21st century skills and previous ones are understood to be both included in a complete pedagogical view. All of this suggests that living in the digital era implies to be digitally educated, building a constantly growing set of skills which has to be closely related to everlasting educational goals (McCannon, 2009; Media Awareness Network, 2010).

Beyond the theoretical considerations, it is necessary to stress all the impact aspects, when setting and providing literacy for the third millennium; 21st century skills are more than technical abilities and must be trained considering carefully the socio-economic-cultural inequalities. In other words, if ICTs impact on more facets of everyday life, all these parts need to be covered by a literacy level. As shown in fig.12, the sole digital literacy implies many skills; going in depth in the analysis, it seems clear that some of them are brand new ones, others are everlasting, and other ones are "old" skills reshaped by media advent (e.g.: networking).

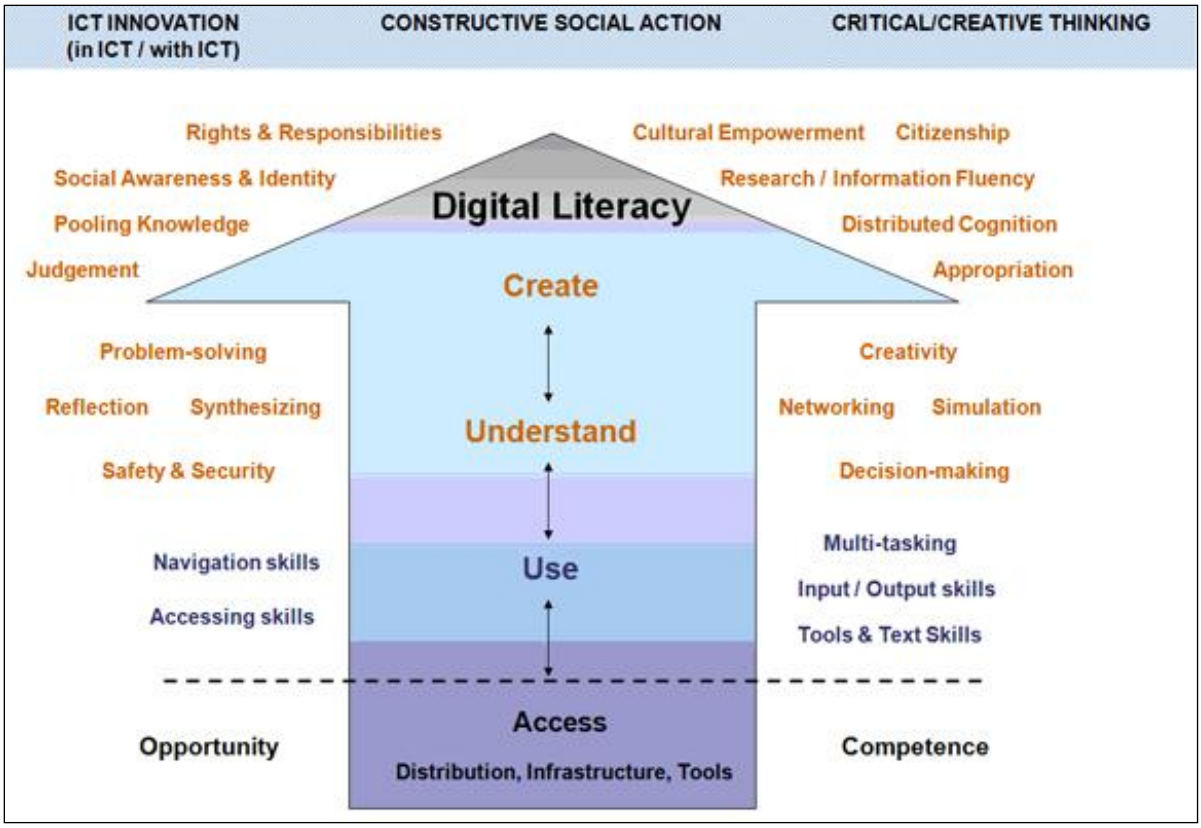


Fig. 12: the framework for a digital literacy and related skills
(Source: Media Awareness Network, 2010)

The schema presented by the Media Awareness Network is useful in this context to understand the complexity of the topic. According to their vision, digital literacy is split into five subsequent steps, and each of them brings together many skills and abilities:

- Access, namely the opportunity to reach infrastructures and tools and the related competence (purely infrastructural);
- Use, meaning to experience and to develop accessing and navigation skills (on the technical side) which open to tools&text skills, input/output skills, and multitasking;
- Understand, meaning to become able to master ICTs: safety and security issues, reflection, synthesizing, problem solving, decision-making, networking, simulation, creativity;
- Create, this is the turning step (from a passive to an active role in effective usages) and implies judgment and media appropriation;

- Literacy (being literate), which means being aware actors of the skills (and paradigms) typical of digital world, such as: pooling knowledge, social awareness and identity, rights and responsibilities, distributed cognition, research of information fluency, cultural empowerment, and– finally – citizenship (Media Awareness Network, 2010, p.6).

The training of digital literacy has three topical effects: critical and creative thinking; ICTs innovation (with technologies, in technologies); and – most relevant for our discussion here – constructive social action.

Coming back to our key-question, "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?", we can add the seventh brick to our framework.

Diffusion of digital technologies needs to be oriented, in order to avoid digital gaps. If, in average, access' gap is being resolved, it is necessary to avoid skills' gaps. eLearner must be trained and educated, in order to offer her/him educational experiences of technologies which are strategic for citizenship.

If ICTs impact on communicative (par. 2.3.1) and educative processes (par. 2.3.2) up to the point to change the paradigm explaining society, what does it happen to human beings? In paragraph 2.4 we will discuss why it is better to adopt a long-term perspective of analysis, not merely narrowed on current times. Then, the personalistic view will be presented, as a useful compass to understand human beings; and Baumann's approach will be mentioned in order to be aware of the anthropological risks of the knowledge society.

2.3.4: Within a broader and long-term reflection about human beings and ICTs

The fourth category of contributions which help in framing the topic of this dissertation refers to the philosophical-anthropological level of the scientific reflection. The question behind our discussion moves towards a broader one, understandable as "how do we conceive human being, when we think, set, and provide eLearning?". Do we imagine a sort of "cyber-person", technologically-enhanced? To what extent do we believe tools

(like a pc or a cellphone) can legitimately drive personal and social behaviours? How much do we consider the advent of ICTs must change human habits in socializing, learning, living?

It is clear how useful, powerful, enhancing, and enjoining can be a "digital" life; what can help us in preventing to unbalance the focus (from humans in favour of machines), avoiding the misunderstanding of asking people to adapt to means, instead of the opposite?

Two examples (the advent of year one thousand and the diffusion of television) will offer us the basis for a cautious approach, which avoids analyses just narrowed on the immediacy of the present. Then, we will pick out some helpful contributions from the work of two well-known thinkers: Maritain (philosopher of education) and Baumann (philosopher of society), without any claim to offer here any ultimate philosophical discussion on the topic.

This paragraph should lead the reader to adopt a wise perspective (based on long-term reflection), and to refuse three (potentially) misleading visions: simplistic, determinist, or instrumentalist. As it has been said, we need "to go beyond a sterile opposition between techno-luddites and technophiles"(Cantoni & Tardini, 2010, p.20).

2.3.4.1: Technology and History of humanity, an example suggesting a cautious approach

In chapter three we will see how hot and controversial the debate concerning the existence of a digitalized generation of learners is. Not outstandingly, positions and visions cover a wide range: from the fully enthusiasts, to the concerned ones, passing through the critic ones. Actually, it must be noticed that such drastic feelings toward the impact of technology development on society – and therefore on educational processes – are not at all a novelty in history. And a cautious attitude regarding this complex topic should to be adopted. An example may help us in resizing the discourse in a more moderate and reasonable way: the advent of broadband mass-TV.

Everyone can remember how dramatically the fact that a broadband media such as television could reach, since the 50s, common people was perceived. Scholars and

thinkers adopted conflicting visions: the positive ones (for example: Johnson, 2005) were fascinated by the power of communication of the mean in terms of spreading knowledge, reducing literacy gaps, creating broader common grounds in the society, and so on; the negative ones (for example: Popper, Condry, Bosetti *et al.*, 1994) were concerned about the lack of democracy, the big manipulating power of the few persons in charge of, the risk of cultural flattening, etc. Critical theories, such as the *hypodermic needle model* (Berger, 1995) one, focused on all the possible dangers; while enthusiastic early adopters started to use television in schools, not always with results in teaching effectiveness (Soulages, 2003). Likely, *in medio stat virtus*, and it seems better to adopt an acknowledged approach to this subject, being aware of the weaknesses and the tricks, as well as of the advantages and potentialities(Eco, 1973).

From this analogy we should learn that it is highly needed a mature, aware, and not extremist perspective about the effects of technology development among human beings; and, *a fortiori*, this is true in pedagogy and anthropology. We must take this warning into account in answering our key-question "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?".First of all, drastic approaches to socio-cultural-historic changes have to be refused, and cautious (open-ended) analyses have to be pursued. Besides, human beings can not be understood within simplistic, deterministic, or instrumentalist visions because they do not take enough into account long-term processes, especially when analyzing people and technological development.

2.3.4.2: Why a counterbalance is needed. The lesson of Personalism

Does living in the digital era mean being a digital person? The macro-sociological overview we mentioned risks to become a hermeneutic criterion of the human being which focus is unbalanced on the technology side.

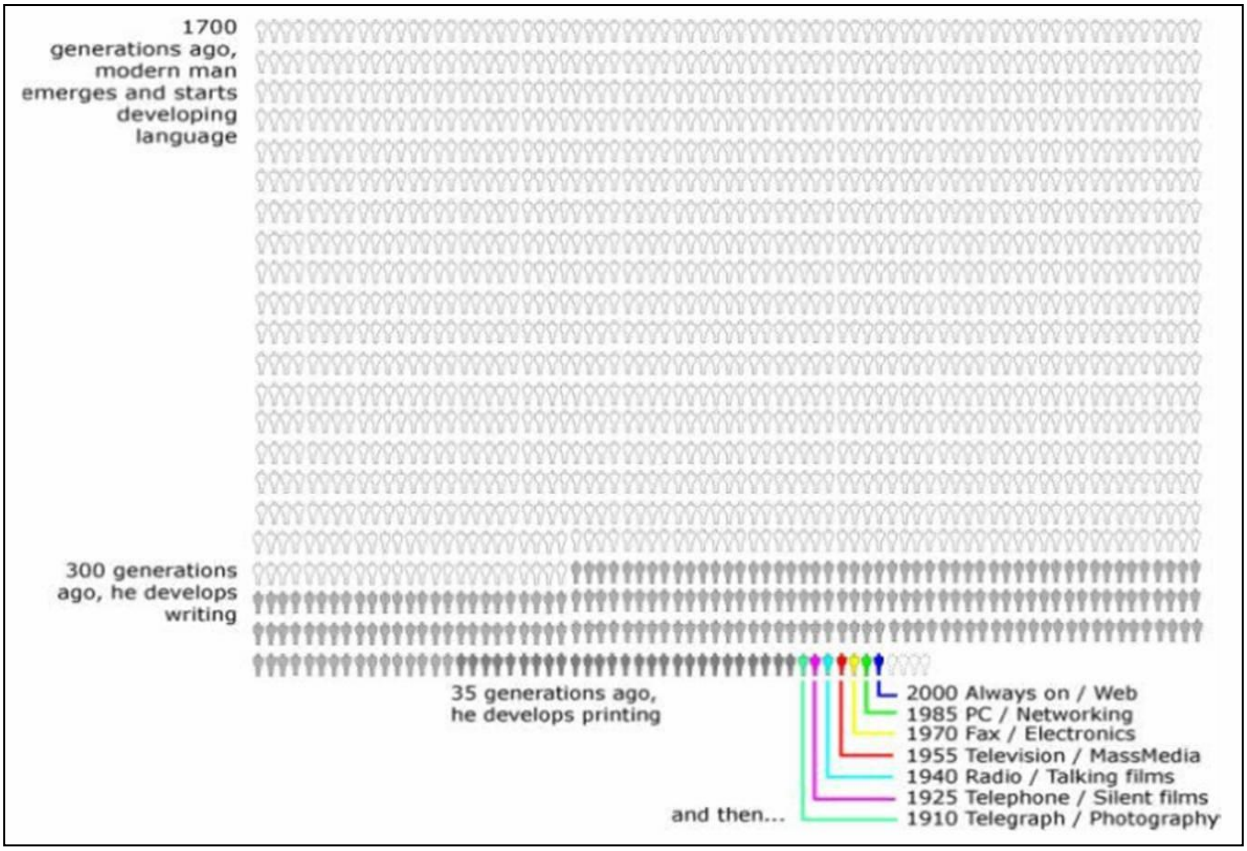


Fig. 13: the world generations and the development of technologies

(source: deKerckhove, 2003)

The previous picture(nr.13) shows how this approach can be reductive. Clearly, it is not possible to accurately count the number of the generations since human appeared on the Earth. Nevertheless, we can state that the development of learning strategies connected to eLearning is a very recent process if we compare it to the history of humanity. As said before ICTs are pivotal today, though we have to avoid the technological drift: humans define technologies and digital has to adapt to learning needs, not *vice versa.*What emerges from the deKerchove admonition can be read as following: digital technologies are too recent in history for having already modified the human process of development.

So, how can we re-focus on person? The “integral humanism”(Maritain, 1973)of the philosopher of education Jacques Maritain can help us to find an answer. In the whole current of Personalism, the idea of person is the fundamental value underpinning the pedagogy and the way in which the society educates its citizens. Previously, Mounier

(1950) had already explained that the goal of education is the human being in his/her fullness, unity and harmony; in effective respect of the individual vocation, which is fully realized only in the membership of community life.

Maritain expands this anthropological view asking for a metaphysic reflection, in order to establish an idea of person, which can emphasise the relationship with the spiritual values. In his anthropological view, education must be liberal and for all; moreover, it must be: oriented towards wisdom, humanity-centred, aimed at developing correctly the ability to think and to enjoy freedom and beauty. His critic against the pedagogic scientism constitutes a useful compass to correctly orientate the anthropological view on today's learners. As he writes:

> It should be noticed that if we try to found the education, and to realize its aim solely on the basis of the scientific concept of man, we could not help to misconceive the concept: because, in facts, we would be obliged to pose the question about the nature and the human destiny; and we should answer stressing the only idea we have, that is the scientific one. [Doing that], then, we will try to draw from this concept a sort of metaphysic, which is absolutely contrary to its typical structure (Maritain, 1947, p.18).

The message relevant for this dissertation topic can be read as following: tools and methods (ICTs) are knowable thanks to science; human and social sciences can describe how instruments are used and can be used; but to understand human beings' richness and complexity, a metaphysic is needed, because the scientific view is not open and wide enough to see the person as a source of infinity.

We adopted the view of Maritain to answer, for the ninth time "Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?" because we consider that philosophy of education is meant to describe things as they should be. In his reflections, human being can not be understood or narrowed within simplistic, determinist, or instrumentalist visions; even when acting like an *homo technologicus*,

man is a free person. Scientism looks like to be insufficient to describe human integrality, and to drive pedagogical goals.

2.3.4.3: Bauman's critical analysis of "liquid" society and "*homo consumens*"

The framework journey comes to the final contribution: reflections about our society proposed by the Polish philosopher of sociology Zygmunt Bauman. Two keystones of his reasoning are presented here in terms of warning on possible risks of knowledge society.

The first one comes from the famous concept of *liquidity* (considered to be the paradigm of post-modern society, characterised by an exaggerate fluidness in relationships) he coined and used many times (Bauman, 2000; 2003; 2005; 2007b; Z. Bauman & Cupellaro, 2009). Baumann argues that social action is transforming into the liquid form, meaning that interactions are, day by day, closer to flows defined by instability, uncertainty, dependence, etc. His position is clear about the responsible factors: consumerism, which transformed citizens-producers into citizens-consumers. The human being *liquefies* consuming because it is a restless process, whose goals disappear when the goods are bought.

In contrast with an educating society aiming at the integral human (as said in 2.3.4.2), liquidity creates problematic issues respects to identity, sense of unity, sense of responsibility, etc. In this dynamic, ICTs become multipliers or annihilators of self; and the result is an undefined society and a "smashed-self".

The consumerism is an heritage of the industrial society; but, in that context, economical rationales used to limit the hysterical consumption. In the digital era – intended by Baumann as "post-modernity" or "consumer society" – consumerism is manifesting some controversies.

> The consumer society is based on a never-ending dissatisfaction, which means unhappiness. One strategy to obtain a never-ending dissatisfaction is to downgrade the goods which are on the market [when it has been already bought, after the marketing strategy...].

> Another way, more efficient and more insidious, is to satisfy so completely each wish so that it can not come the impulse to desire something different: the wish transforms in need, and becomes a compulsive must, and an addiction. [...]
>
> The continuous obsolescence of goods is reflected in the rising tide of dashed hopes.[...]new hopes and wishes have to constantly arrive, and replace and overcome the old ones; and, to do that, the road between the store and the trash must always be shorter(Bauman, 2007a).

The position expressed by Baumann unveils a pessimistic vision: consuming is the characteristic of current times, but it is described like a way of being in contrast with a real and aware life.

We have introduced the Polish thinker without adhering completely to his vision, but because his critical approach seems very valuable to take a look to the negative socio-cultural and anthropological implications of digital era. It must be clarified that the point is not to be against technologies: they are useful and luddites were wrong. At the same time, there is a significant attention towards phenomena aimed to overcome the schizophrenia of consumerist life; especially among young people, concerned about ecology, sustainable economy, and ethical consuming behaviours (Becchetti & Costantino, 2006). Moreover, observers of trends in technology adoption for learning usages are reporting a growing conservatory approach by students (Pedró, 2010), who ask for more classical way of teaching (face-to-face, books and notes, classes...) and seem to be less attracted by ICTs. Such a scattered context challenges the conscience of educators and politicians: reflecting on the rapid diffusion of digital tools and gadgets (and their obsolescence), it is legitimate to ask whether there is any commercial bias in the choice of educational technologies.

Parallel to the previous sub-paragraph, we adopted the view of Bauman to answer, for the last time “Which idea of learner is inspiring us and are we promoting, when we set and provide eLearning?”because we consider that philosophy of sociology is meant to

describe things as they could be. Liquidity weakens the sense of human unity and social identity; consuming erodes the sense of being. Both concepts are (also, not only) depending on the great ICTs diffusion: education of eLearner must absolutely take into account such aspects, in order to avoid all the drifts not converging to anthropological goals defined for education.

ICTs are a *principal* path of investigation around eLearners, but not a *principle* of description.

This sub-paragraph put in evidence the anthropological non-reducibility of human beings. This is why, in the methodological setting (see chapter 6) quantitative methods have been paired with qualitative (quasi-ethnographic) ones.

Chapter 3: Review of dominant trends in the literature

This chapter explores the rhetorical artefacts leading and inspiring the literature in the field, over the last twenty years of reflections.

The first paragraph is devoted to underlining how complex and controversial is the debate around the dichotomy "learners and new media". Because of that, many voices have appeared, not infrequently contrasting each others. In the text it is explained why it is necessary to de-construct the rhetoric – sometimes implicit and/or unaware – and to discern how to get oriented.

Consequently, in paragraph 3.2, three different strategies to deal with – and get oriented within – this corpus of knowledge are proposed:

- *An* historical *analysis of the evolution of the main trends in the debate, split into two decades.*
- *A* geographical *approach, meant to face the topic from a perspective non-narrowed/oriented by the historical evolution of a theoretical trend. In particular, results from New Millennium Project are proposed, because of their valuable condition of coming from an international research conducted by OECD.*
- *An* "ideological" *abstraction of the key-points emerged during the abstraction and merged in "families" of thinkers. Three views have been identified; researchers can interpret the dichotomy learners and new media with an "enthusiast", "concerned", or "critic" attitude. Researchers belonging to the first and second groups are firmly convinced of the existence of a generation of digital learners, the first ones focus their attention on positive effects, while the second ones are narrowed on negative ones. On the contrary, "critics" are suspicious about the existence of such a "generation", and not convinced of the consequences of adopting this theory. Moreover, it is possible to split the first group into three sub-approaches: the thinkers who focus on historic-sociological aspects of the generation of digital learners; the ones who focus on psycho-*

cognitive features; and the ones who read the theme with a socio-pedagogical approach.

Metaphorically speaking, the above is like a jungle and the paragraph is aimed to offer paths to be walked through.

Paragraph 3.3 explores the main consequence of the ideological approach – which is the strongest one, because its mechanisms are related to implicit rhetorical artefacts – namely the label issue. That is the strategy/trend of labelling nowadays learners. Once a label took place, the traits implied by the reasoning behind that tagging process, are often automatically adopted. As per today, there exists a plethora of labels. In the text they are presented, together with a taxonomy to discern rhetoric implied in the debate.

The fourth paragraph recapitulates the speculative journey with theoretical tools considered to be helpful to set a sound research. The first tool is a flow chart one researcher can use to realize which kind of view and/or approach s/he is likely to adopt. The second one is a map of the labels proposed by enthusiasts, organized in by historic-sociological, psycho-cognitive, and socio-pedagogical approaches. Finally, the text comes back to all the precious hints from the literature. Such corpus of knowledge is considered to be the helpful starting point for establishing a valuable research perspective to observe the learners of the digital era.

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- OECD-CERI. (2012). *Connected minds: Technology and today's learners*. Paris: OECD-CERI (Centre for Educational Research and Innovation).
- Rapetti, E. (2011). The knowledge society between "smart devices" and "digital learners". A pedagogical-anthropological reflection about the implications of dominant rhetoric in eLearning field. In L. Cantoni, P. Dillembourg & D. Euler (Eds.), *Proceedings of the red-conference: Rethinking education in the knowledge society (Ascona, Switzerland, 7-10 march 2011)*. Lugano, Switzerland: Università della Svizzera italiana.
- Rapetti, E., Butti, M., Misic, S., Botturi, L. & Cantoni, L., (2009). Realizing the technological potential of young employees with LEGO bricks. *Ethnographic Praxis in Industry Conference Proceedings - August 30 – September 2, 2009* (pp.343-347). Chicago, IL-USA.
- Rapetti, E. & Cantoni, L. (2010b). Exploring the added value of digital technologies and eLearning in higher education from learners' perspective. A research informed by a systematized literature review. In *Edu-Learn 2010 Conference Proceedings* (pp. 1403-1412). Barcelona, Spain.

3.1: The dichotomy "ICTs and learning" and the implied controversial question

As said in chapter 1, "learners and new media" constitute a very debated dichotomy. Many pedagogical currents and didactical theories have been developed in order to answer the implied decisive question: "does a generation of digital learners exist?".

This chapter is devoted to explore the dominant trends in the debate during the last 20 years. In particular, we will focus on the rhetoric artefacts adopted by the main voices in the field.

3.1.1: Why an abstract linguistic issue is relevant in a pedagogical research

During the last 20 years, reflections around learners and new media have grown constantly, reaching the worldwide academic level, and providing to the same question contrasting answers. The uncertainty turns around the interpretation of the role of ICTs in learners' experiences.

In order to keep track of all its fundamental facets, such question might be articulated as following:

DOES THE FACT OF LIVING IN A DIGITAL ENVIRONMENT CREATE/MODEL A GENERATION/COHORT/GROUP OF DIGITALIZED LEARNERS?

In facts, the list of variables influencing the answers concerns all the aspects mentioned in the above formulation:

- "the fact of living in a digital environment", meaning a continuative, proactive, significant interaction with ICTs is suspected to impact on learners' behaviours;
- "digital environment" constitutes a pre-comprehension and pre-definition of the context, which is likely to be applicable to all the OECD countries, but not to all the countries of the world;
- "create/model", the relevance of ICTs in everyday life seems to have a sort of transforming impact, people are expected to be different when using media;

- “generation/cohort/group”, scholars consider the possibility that a continuative exposition to digital media can modify individuals’ behaviours, creating groups of people with similar traits; some authors suggest this is a generational process;
- “digitalized learners”; the environmental experience of digital might have two implications in learning reflections, the first is that people (can) learn digitally, the second is that learning and teaching have to be digitalized to stay up-to-date with the world development.

As we will see, a very great number of thinkers and researchers have provided their contributions, both at the level of theoretical reflection and of empirical research.

Nevertheless, a definitive word is still lacking. It is also clear how a univocal answer may be diriment in inspiring and leading instructional design in the 21st century.

If at a first sight such question involves just didactical choices, it must be highlighted that – even more relevant – it challenges the idea of education; consequently the idea of society and humanity. With stakes so high, an hot debate is not surprising.

Among the goals of the dissertation, there is the ambition to offer a research around learners and new media avoiding a prejudged idea of the topic. Such effort of neutrality comes from the study of the literature review, which put in evidence how valuable pieces of knowledge can be identified in positions contrasting each others. So, adopting *a priori* a theoretical position, might mean to implement a mindset over the theme which could even influence research’s results.

The next paragraph will offer three potential paths to be taken in the jungle of contribution around the question “does a generation of digital learners exist?”.

3.2: Paths in a jungle of reasoning

The mindset adopted by a researcher to deal with the dichotomy learners and new media plays a big role in the research’s outputs and it can be nothing but neutral.

This chapter is meant to put in evidence the main trends and the mindsets adopted by and diffused within scholars and researchers during the last two decades. The text is not

aimed to be a meta-search, comparing methodological choices and procedures. Even less, this thesis is written to promote or reject jobs done by colleagues.

Rather, we propose a second-level-analysis of many different way to address and interpret the topic. In reason of that, the problem will be analyzed also in a linguistic perspective.

There is a wide panorama of approaches around the idea of a digitalised generation of learners (not infrequently, somehow at odds with each other). To navigate this sea it is necessary to find a criterion to abstract the debate. It is possible to discern thanks to the chosen methodology of analysis, as following:

- Empirical-quantitative research, mainly throughout questionnaires (for example Junco & Mastrodicasa, 2007);
- Collection of evidences from a given context and then generalisation, that could be considered an extension of the case-study method (for example Oblinger & Oblinger, 2005);
- Socio-historical analyses (for example Howe & Strauss, 2000);
- Theoretical reflection, with pedagogical implications (for example Tapscott, 1998).

Alternatively, it is possible to split the debate in regard to the involved discipline: History (for example Strauss & Howe, 1991);Pedagogy (for example Rivoltella, 2006); Philosophy (for example de Kerckhove, 2006); Anthropology (for example Veen, 2006); Neuroscience (for example Small & Vorgan, 2008); Sociology (for example Bauerlein, 2008);Economy, focusing on demographical aspects (for example Pedró, 2009); Media Consumption studies (for example Nielsen 2009); and Marketing (for example Leopoldo 2011).

In the following three paragraphs we will try to move a step further, outlining how the theme has been observed rather than focussing on the theme itself. Such meta-analysis will be stressed using the metaphor of the jungle, proposing three paths which seem reasonable to be walked to unveil and understand the dominant trends and rhetorical artefacts dominating in the debate.

3.2.1 Path one: history of the debate. From a certainty to a doubt

The main voices orienting the reflections and animating the discussion worldwide have been appearing since (about) 20 years ago. Analyzing this period, an evolution in the approaches merges.

During the first decade, authors from different fields contributed to the establishment and the diffusion of the theory about a generation of digital learners.

Then, after the end of the millennium, the theme gained a greater attention and became more relevant and urgent to different stakeholders' agendas; probably because of this larger popularity, one can register a plurality of voices. This second decade saw the emergence of contrasting and opposite opinions. The certainty of the nineties – a generation of digital learners does exist – became a doubt. And the debate went hot.

3.2.1.1: The first decade: a generation of digitalized learners does exist

The work of Neil Howe and William Strauss can be considered like the starting point for the establishment of a theory about a generation of digital learners, because of the provoked publicity around the theme; and also because of the persistence of their intuitions during the past two decades.

In their famous book *Generations: the history of America's future, 1584 to 2069*(Strauss & Howe, 1991), they provided a very interesting and appealing reading of the American history, based on the idea of an endless circle of four archetypes of generations (namely: heroes, artists, prophets, and nomads) following one after another throughout centuries, bearing certain recurring universal traits. Then, because of the historical climate, each generation develops distinguishing characteristics; now is the turn of *Generation Y* (referring to the fact that they come after the *Generation X*) or *Millennials* – born in the 1982-2005 period – said to be "heroes".

"Heroes" means: "Increasingly protected as children, they become increasingly indulgent as parents. Their principal endowment activities are in the domain of *community*, *affluence*, and *technology*. […]They have been vigorous and rational institution builders. All have been aggressive advocates of economic prosperity and

public optimism in midlife; and all have maintained a reputation for civic energy and competence even deep into old age." (*idem*).

In 2000, in the subsequent text – *Millennials rising: the next great generation* – the two sociologists of history focus precisely on the third millennium generation and definitively adopt the expression *Millennials*. It must be said – as reported in the text – that this term was chosen after an ABC poll in 1997, being voted more popular than such expression as: Generation Y, Generation Why, Generation Tech, Generation Next, Gen.com, Generation2000, Echo Boom, Boomer babies, Generation XX, Generation Whatever, Gen-D, Boomlets, Prozac Generation and a multitude of others (many of them are analyzed in tab.5); it is remarkable that the second ranked was "Don't Label Us" generation (Howe & Strauss, 2000).

Such *logomachia* (Greek word meaning "fight of concepts") shows how much the theme is under discussion; and how much, instinctively, the concept of generation stimulates consensus. The work of Howe and Strauss is important because they have definitively inspired the debate worldwide, laying the cultural foundation for the etymologic shift from "younger" to "generation".

The authors' historical argument is vast (since they analyse the whole American history) and what is interesting here is a synthesis of the main theoretical assumptions of this approach; namely how the *Millennials* are expected to be.

This cohort of people is described according to seven distinguishing traits; they are drawn by crossing the historical characteristics attributed to "heroes" and the specific sociological and contextual data related to *Generation Y*:

- Special – They feel this way because of the enormous amount of economic and educative attention their parents devoted to them for the first time in human history (if only compared to their grandparents playing alone in the streets).
- Sheltered – Never before children have received so much protection, in medicine, as well as in social experiences (if a millennial can not go to school, it is considered a scandal).
- Confident – They trust in authority because parents and educators gave them a lot.

- Conventional – In opposition to the Generation X cohort, they prefer to respect rules of conduct, proper dress and social authority and not to take risks (their revolution is not about “changing the world” but to do their best in order to score better).
- Team-oriented – due to their experience in school and the opportunities given by the Web 2.0.
- Achieving – Generally speaking, they score much better than any other generation before in education.
- Pressured – They have been spoiled and coddled to reach the top, now they feel it’s time to give in back something (often young Millennials suffer because of anxiety, stress, and similar pains).

After Howe and Strauss, there was a constantly growing number of publications aiming to better describe and define people belonging to the digital generation.

The following timeline will explore the evolution of this idea, mentioning the authors which gained enough popularity to be cited in academic/scientific papers.

Tab. 3: timeline of the theory of digital learners during the first decade

Year	Evolution of the theory
1991	Howe and Strauss open the way. People born after 1980 are different. This difference is based on generational traits, and the digital *milieu* plays a major role. They invented the "Generation Y" label, which is still in use.
1991	Soloway coins the Nintendo Generation expression, putting the attention of the never-seen-before trait of young people: they are video-gaming.
1993	According to Papert, it is more than a historical or sociological difference. The theme involves pedagogy and psychology. People grown up with a remote controller at hands are used to change and switch: they have a "grasshopper mind".
1995	Controversies implied by internet usage start to come to the surface. It is the time of "Life on the Screen: Identity in the Age of the Internet" by Turkle, exploring a unknown issue, such the *multi-users identity*.
1998 (2009)	Tapscott inaugurates a strand of research about the habits of the "net-generation", namely the ones who are "growing up digital" (and who, in 2009, are "grown up digital"). He leads research projects meant to observe how they are different in learning because of ICTs and the growing importance of the internet. In his opinion, they have the chance to be the greatest generation ever, because of the infinite chances to access knowledge.
2000	Howe and Strauss double their success, exploring – at the millennium turn – the expected traits attributed to the "millennials". Younger are described like the "next great generation". After ten years, their generational theory has fulfilled the public debate; from academia to newspapers.
2000	Frand discusses how to deal with the implications for higher education due to the "changes" in students' mindset.

The above puts in evidence how the hypothesis of Howe and Strauss constantly grew in reputation, achieving the level of a theory, being applied and verified, and – finally – transforming into a scientific perspective.

The intellectual mechanism supporting the digital learners' perspective must be clearly explained: actually, such view is made stronger by a dialectic process of reciprocal influence between the push to educate digitally because learners live in a digital environment, and the assumption that they are digital natives. In other words, when the digitalisation of learners is not the cause (I have to update my didactical strategies because my students are digital), it is the goal (I have to digital-teach in order to prepare my students for the technologised *milieu*).

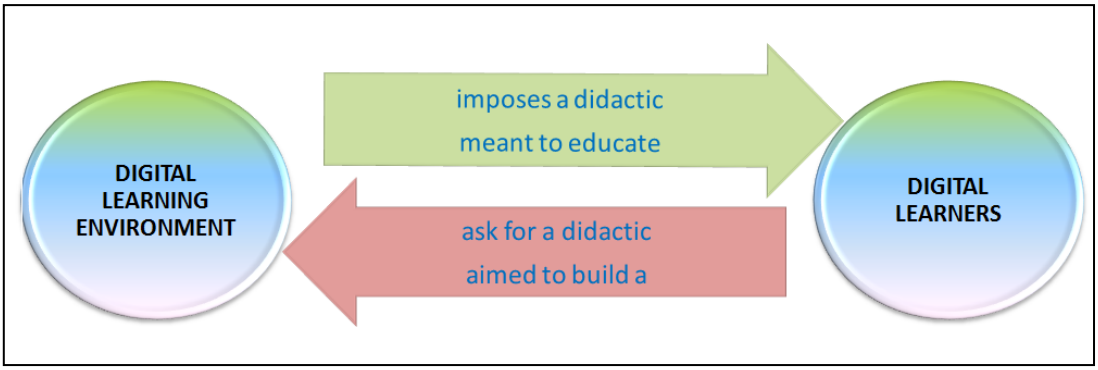


Fig. 14: internal dialectic of the perspective over digital learners

An important elucidation is needed: the hypothesis of a generation of digitalised learners has been pivotal for many innovation processes (at any level, from classes-experiences to educational policies); nonetheless, incontrovertible empirical proofs of its existence are missing.

It probably gained prestige for the following reasons: it explained cogently and briefly a complex reality, which was worrying for parents and educators. The concept offered a common-sense based interpretation, easy to understand, based upon the everlasting contraposition between the younger and the older. It arrived to fill a lack of knowledge and understanding in the theory of education. It may well be that, on the whole, digital technologies are too recent, and their effects on learners too multi-faceted and

interrelated – and hence difficult to untangle – to allow the research community to provide a coherent knowledge base for the concerned stakeholders.

After ten years of spreading, the idea transformed into a socio-pedagogical matter of fact. It is the time of the video game consultant Marc Prensky, inventor of the notorious "digital natives" label, and – unconscious? – promoter of a burning debate.

3.2.1.2: The second decade: does a generation of digitalized learners exist?

At the beginning of millennium the debate became more articulated, and from a main root of reflection developed multiple – and even contrasting – trends.

The first and more decisive contribution came from Prensky. He – in the two articles "Digital Natives and digital immigrants" (Prensky, 2001a)and "Do they really think differently?"(Prensky, 2001b) – pointed out the existence of a generation of people socialised to learning, through ICTs, since early childhood. Because of this, they are likely to be adept with computers, creative with technology and, above all, highly skilled at multitasking in a world where ubiquitous connections are taken for granted. Following this line of thought, young people continuous use of ICTs is assumed to have important implications for the development of their intellectual competences and cognitive skills, to the extent that some authors think that they do, in fact, really think differently. The hypothesis of different neural paths is favoured by researches on neuroplasticity; as a matter of fact it has been discovered that "the brain constantly reorganizes itself" (Prensky, 2001b, p.2). In light of a review of the literature, it is correct to state that his position represents a merging of the various concepts emerged during the previous decade. Moreover, he focused the attention on learning, suggesting empirical ways to deal with the learning needs of "natives".

To synthesise this conception, Prensky invented the famous label "digital natives" and he claimed that:

> It is now clear that, as a result of this ubiquitous environment and the sheer volume of their interaction with it, today's students think and process information fundamentally

> differently from their predecessors. These differences go far further and deeper than most educators suspect or realize. "Different kinds of experiences lead to different brain structures" says Dr Bruce D. Berry of Baylor College of Medicine.[…], it is very likely that our students' brains have physically changed – and are different from ours – as a result of how they grew up. But whether or not this is literally true, we can say with certainty that their thinking patterns have changed (Prensky, 2001a, p.1).

This difference has structural implications in socialising, behaving, and learning processes, as remarked and extended in his subsequent text *Mum, don`t bother me, I`m learning* (Prensky, 2006). Moreover, such reflections opened the debate about the controversial theme of the digital gap separating the natives and the immigrants.

We can say that Prensky coloured and led, for better or worse, all the subsequent debate. Actually, what especially warmed the status of reflection is the hypothesis that is not just the environment to be digital, but even the persons (Prensky, 2001a). Indeed, the charming idea of a difference approach to learning because of ICTs massive exposure was the starting point of a decade of a complicated, nebulous and controversial debate and produced a number of views, approaches, researches, and labels. This corpus of information gives the impression of a very scattered field, where too many – and too different – contributions not often become useful and clear knowledge for parents, educators and policy makers. Even if there is almost universal agreement about the opportunity to empower learning experiences with ICTs, thinkers and commentators are divided about the assumption of the existence of a generation of digital natives.

As said, during this second decade, many trends developed. Three are clearly recognisable. The first aggregated around the followers of the theory of a generation of digital learners. The second sprout out in clear opposition to a positive attitude toward this generation, expressing a preoccupied position because of the risks provoked by the widespread diffusion of digital devices and facilities. Then, around the half of the

decade, a third trend appeared; scholars belonging to this group started to investigate critically the idea of a generation of digital learners, aiming to demonstrate its fallacies.

The negative feelings started because of the growing number of risks and problems implied in new media usages, reported during the previous years. The American association MAVAV – Mothers Against Videogames Addiction and Violence – constitutes the first impactful and well-documented (2002) actor of this trend.

The "dark side" of the *digital* generation seems to cover a lot of facets; younger are said to be violent, online bullies, and net addicted to pointless activities(MAVAV, 2002-2006).

Plus all the well-known (and documented) psychological and medical issues related to sex harassment, pedo-pornography, net-addiction, voyeurism, exhibitionism, and anorexic or bulimic behaviours in media diet (Sieberg, 2011).

This is in stark contrast with the previous voices about learners and new media, and the "next great generation" painted by Howe and Strauss (2001) does not seem to fit with the concerns expressed about the younger.

To understand such position, an excerpt from the provocative "The dumbest generation How the Digital Age Stupefies Young Americans and Jeopardizes Our Future" (2008) is useful:

> […] hyper-networked kids who can track each other' every move with ease, but are largely ignorant of history, economics, culture, and other subjects [… And the fault comes exactly from ICTs usages:] for digital immigrants, people who are 40 years old who spent their college time in the library acquiring information, the Internet is really a miraculous source of knowledge. Digital natives, however, go to the Internet not to store knowledge in their minds, but to retrieve material and pass it along. The internet is just a delivery system (Bauerlein, 2008).

Then, a third trend arose.

Since around the mid the decade, scholars developed new reflections, expressing perplexity not about the positive effects of ICTs, rather on the idea itself of a generation of digitalized learners.

Both theoretical assumptions and empirical researches began to be criticized. On one side, the theory of a generation of digital learners is questioned for its linguistic inconsistency or dangerousness (for example: Bennett *et al.*, 2008; or Bullen *et al.*, 2011); on the other side, results from other empirical researches reveal a complexity of the relationship learners-new media which does not match with the universal traits attributed to digital learners (for example: Kvavik, 2005).

As recently remarked, anthropological assumptions about the idea of a monolithic generation, simply based on familiarity with ICTs, are hazardous in pedagogy; while it must be remembered that media usages are just a part of the leisure time, together with sports, arts, time with parents, and time with peers (Schulmeister, 2010).

Thinkers following this trend tend to consider the digital generation of learners theory as an inspiring starting point rather than a proper subject of study. According to them, it is possible to move a lot of criticisms to the generational approach, from invoking for deeper and sound analysis (Bennett, *et al.*, 2008) to unveiling weaknesses in the argumentations:

> A review of literature on the millennial learner and implications for education reveals that most of the claims are supported by reference to a relatively small number of publications. The works most often cited are Oblinger & Oblinger (2005), Tapscott (1998), Prensky (2001a, b), and Howe & Strauss (2000). Other works that are often mentioned, although less frequently, include Seely-Brown (2002), Frand (2000) and Turkle (1995). What all of these works have in common is that they make grand claims about the difference between the millennial generation and all previous generations and they argue that this difference has huge implications for education.

> But most significantly, these claims are made with reference to almost no empirical data. For the most part, they rely on anecdotal observations or speculation. In the rare cases, where there is hard data, it is usually not representative (Bullen *et al.* 2009).

The following timetable shows how the debate evolved during the second decade.

Tab. 4: timetable of the debate during the second decade

Year	Evolution of the theory and development of contrasting trends
2001	Prensky coins the famous label "digital natives", meant to describe the young learners, grown up in a digital environment; he suggests that, because of the everyday practice with ICTs, people developed a different brain. Such condition creates a dramatic gap of skills between the natives and the immigrants.
2001	Lenhart and colleagues offer a new definition: "Instant Messaging Generation". Such labels consolidates an approach launched by "Nintendo generation", to define young learners with their digital behaviours. It will be a transversal attitude during this second decade.
2002-2006	The association Mothers Against Videogames Addiction and Violence expresses many concerns about the digital development. Problems such online violence, web bullism, net addiction are highlighted and push onto educators' and policy makers' agendas.
2002	Reflecting about how the internet is changing the way to access information, Brabazon classifies the youngest like "the ones who click, instead of thinking, when looking for knowledge".
2002	Similarly, Seely-Brown and Duguid discuss many controversies of digital living and learning, in their book about the social life of information.
2004	Carstens and Beckargue that children and adolescents are developing new cognitive and relational skills, due to their prolonged condition of video-gamers; the fact of being "gamers" will help them with adult life's tasks.
2005	Oblinger and Oblinger explain how to educate the Net generation, adopting the label popularized by Tapscott. Their starting point is the empirical observation of their children. Thanks to their paper, EDUCAUSE spouses the idea that there is a net generation and starts to provide many documents on how-to-deal-with this generation.
	The timetable continues →

2006	The New Millennium Learners project is launched by OECD, under the supervision of Pedrò.
2006	Rivoltella writes "Screen generation", pointing on a common trait of all the digital devices: the screen
2006	Veen invents the label "homo zappiens", enlarging to all users of digital tools the intuition proposed in 1993 by Papert.
2007	Keen synthesizes the educators' concerns about the abuse of search engines and web encyclopaedias, defining digital learners "the ones who take Google as Gospel".
2008	2008 is a hard year for younger people who are great users of ICTs, indeed they are defined as: - Narcissist (Twenge, Konrath, Foster*et al.*, 2008) - Dumb and ignorant (Bauerlein, 2008) - Coddled, adrift, and slackers (Damon, 2008) - Shameless (Durham, 2008)
2008	Likewise, 2008 is an important also because of thinkers expressing criticisms, worldwide. In Australia, Bennett and colleagues enter into debate with the Prensky's work, unveiling the risk of an "educational give up" if the gap between natives and immigrants is described in terms of generational difference. They suggest to start deeper and contextualized researches, and to avoid hyper-generalisations. In Germany, Schulmeister defines a mystification about the dominating concept of net generation, providing data evidence that a difference in the use of ICTs between younger and older is observable only for what concerns the seeking information ability.
	The timetable continues →

2008	Though, the fame of "digital natives" approach is at the top. Also Switzerland enters in the worldwide arena about the theme. Palfrey and Gasser publish "Born digital", depicting the digital generation with an quasi-ethnographic approach. While Ferri and Mantovani write the book "Digital kids", meant to establish a pedagogy for the natives.
2008-to present	The research consortium lead by Bullen and composed by researchers from the British Columbia Institute of Technology, the University of Regina, and the Universitat Oberta de Catalunya launches the *Digital Learners in Higher Education* research project. Outputs are a number of scientific papers demonstrating weaknesses and errors of the generational theory. Moreover they starts the blog netgenskeptic.org, which collects all the papers related to the topic, offering a systematic critical review.
2009	The number of positions is, by this time, almost uncountable. Growing in number, and – often – contrasting each others, stiffen the positions. So, at Oxford University, researchers of the TALL group elaborate a new label, to express concepts very close to digital natives and immigrants, but making them milder. Suggested labels are "digital residents" and "digital visitors".
2010	Despite 20 years of debate, the second decade ends with Margaryan and colleagues asking critically whether digital natives are a "myth or a reality".

Remarkably, more recently, it has been noticed that

> [...] while the digital generation may be "tech-comfy", they are often far from being "tech-savvy", and perhaps this is where teachers come in; taking advantage of their comfort levels with technologies, we can help them towards a realisation of what all this "connectedness" can do in terms of their knowledge, education and preparedness to enter a workplace where they are studying for jobs that don't yet exist. (Gavin, 2011)

Such position merges the conviction of the existence of a digital generation with the doubts about how the youngest master ICTs in learning. It can be considered like a clue of the uncertainty still ruling, and of the need to develop positions able to overcome – more or less – trendy mainstreams.

Needless to say that the debate is still ongoing, and the third decade of debate started with the book "Deconstructing digital natives" (Thomas, 2011), containing contributions written by authors following different trends.

3.2.2:Path two: geography of the debate. The issue from a international point of view

The first path revealed how the mainstreams dominating the debate can be influenced by more or less *à la page* trends and/or historical/contextual variables. Another way to face the jungle we are exploring is geography, namely observing the mere data outcoming from researches. And, in order to avoid any narrowing related to a specific *milieu*, results of the New Millennium Learners (NML) project will be shown.

3.2.2.1: The New Millennium Learners project

The Organisation for Economic Co-operation and Development is a50 years old agency with an arbiter-role in the international arena; it is meant to offer neutral, objective, and evidence-based policy advices to its 34 member countries. Such institution started NML project in 2005, comparing world wide data; reasonably, results offer a non-limited vision of the topic, coming from a over-national perspective of analysis.

It must be cleared that, in paragraphs 3.2.2, many pieces of texts are excerpts from the official OECD documents (both text and graphs). For a complete analysis, it is recommended to refer to these original reports: "Are students ready for technology-rich world: what PISA studies tell us", 2005; "The New Millennium Learners: challenging our views on ICT and learning", (background paper) 2006; "Are the New Millennium Learners making the grade?" 2010; "Connected Minds", 2012-forthcoming. It is suggested to check also the NML project presentation on the OECD-CERI website: www.oecd.org/edu/nml.

3.2.2.2: The OECD perspective

CERI (Centre for Educational Research and Innovation of OECD) started to focus on the topic in 2006, launching the New Millennium Learners (NML) project. Though, it must be observed that since the first edition of PISA (Programme for International Student Assessment), in 2000, the role of ICTs in education was investigated.

The first official document was "The New Millennium Learners: challenging our views on ICT and learning", a background paper written by Francesc Pedrò in 2006; the most outstanding report was "Are the New Millennium Learners making the grade?" published in 2010; and the last step was "Connected Minds", a forthcoming publication in which I proudly collaborated.

In foreword of "Are the New Millennium Learners making the grade?"the rationale for the NML project is presented:

> Our increasingly technology-rich world raises new possibilities and new concerns for education. First, technology can provide tools for improving the teaching and learning process, thereby opening new opportunities and avenues. In particular, it can enhance the customisation of the educational process by adapting it to the particular needs of the student. Second, as education prepares students for adult life, it must provide them with the skills they need to participate in a society that increasingly requires technology-related competences. The development of these competences, which are part of the set of the so-called 21st century competences, is becoming an integral part of the goals of compulsory education. Finally, in a knowledge economy driven by technology, people who do not master these competences may suffer from a new form of digital divide that may affect their capacity to fully participate in the knowledge economy and society(OECD-CERI, 2010a, pp.3-4).

3.2.2.3: Data-evidence from NML project

The aim of NML project is to offer evidence-based recommendation about:

- Who are the learners of the new millennium?
- How is their life influenced by ICTs?
- Which are the consequences for policies and education?

Therefore, official OECD documents show the relevance of ICTs in learners' life and school experience. As reported, internet access and mobile device adoption are almost universal in OECD member countries, for what concerns private life (OECD-CERI, 2010b, pp.84-86). So, the question arises about the presence of digital in formal learning contexts. Among the main findings of the NML project, it is stated:

> Despite increasing investment in ICT infrastructure in schools, student-computer ratios are still a handicap for ICT use in schools. The OECD average is five students per computer. It has dropped by 50% since 2000, when it was ten students per computer, but it is roughly the same as it was in 2003.(OECD-CERI, 2010a)

Not only investments seem to be unfruitful but also significant disparities among countries are registered. In terms of pedagogical implications, this means that:

> It is important to realise that the fact that students appear to be technologically "savvy" does not mean that they have developed the skills and competences that will make them responsible, critical and creative users of technology. (idem, p.15)

There is no doubt that ICTs can enhance significantly teaching and learning; said that, investments in technology are meaningful when they are part of a political strategy (within institutions and at the capitals' level); such strategy must be driven by pedagogical goals, rather than by the idea of facing a generation of tech-savvy people.

3.2.2.3.1: The policy debate about technology in education

One can argue that schools (and/or areas, and/or countries, depending on the local systems) are not always economically prepared to invest in digital technologies but they could take advantage of the "technological potential"(Bell & Lane, 1998) of digital natives. As shown in following picture, this expectation is contradicted by data:

> It clearly shows that there is no relation between frequent computer use at home and at school by 15-year-olds. Home use does not act as a driver for school use. From a different perspective, [...ratios of students per computer and broadband access are not drivers of computer use in schools, which means that...] countries' efforts to provide quality Internet access and to increase the availability of computers do not seem related to the frequency of use of computers in schools(OECD-CERI, 2010a, pp.29-30).

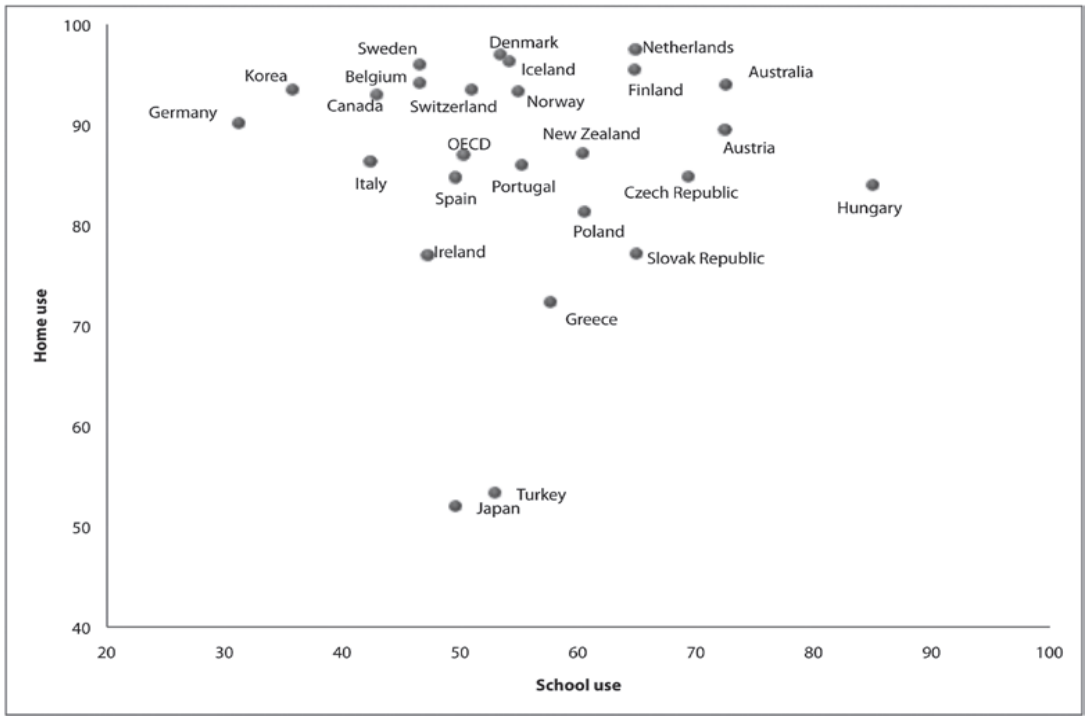


Fig. 15:Percentage of 15−year−olds declaring frequent use of a PC at home and at school
(Data only for OECD countries that used the ICT Familiarity Questionnaire in PISA 2006)
OECD's StatLink : http://dx.doi.org/10.1787/811636413673.

Another important point of reflection concerns the real usages made by NML; data show that principal purposes are communication and entertainment. Respondents to PISA questionnaire, namely 15years-old students from 57 countries worldwide, reported using computer frequently:

- for email or chatting (69%);
- to look up information about people, things or ideas on the Internet (61%);
- to download music (58%);
- to play games (54%), (*idem*, p.12).

Furthermore, it has been observed the "educational productivity paradox" effect. The classic productivity paradox is the missing direct relationship connecting ICTs' adoption and productivity increase. In educational context,

> [...] technology is a tool that can be used for a variety of purposes. Whether the adoption of technology is linked or not to educational performance will depend on the improvements associated with changes in methodology, which require appropriate technical and pedagogical support. If the methodology remains the same as before the introduction of technology, as is often the case when teachers adopt technology in order to perfect what they were already doing, expectations are low. If, in addition, the intensity of use is low, the amount of preparation time and effort may not be compensated by the educational benefits obtained (*idem*, p.12).

It is necessary to understand that the key-question to ask is not which technologies enhance the education process (and increase productivity) but which are the new "technology-supported methodologies" able to improve the learner's performances.

3.2.2.3.2: ICTs and educational use

Usages related to more advanced purposes rank lower; for instance: to download software (41%), or to collaborate with a group or team (37%). And even worst is the percentage of uses precisely related to the didactical sphere, such as educational software (see below).

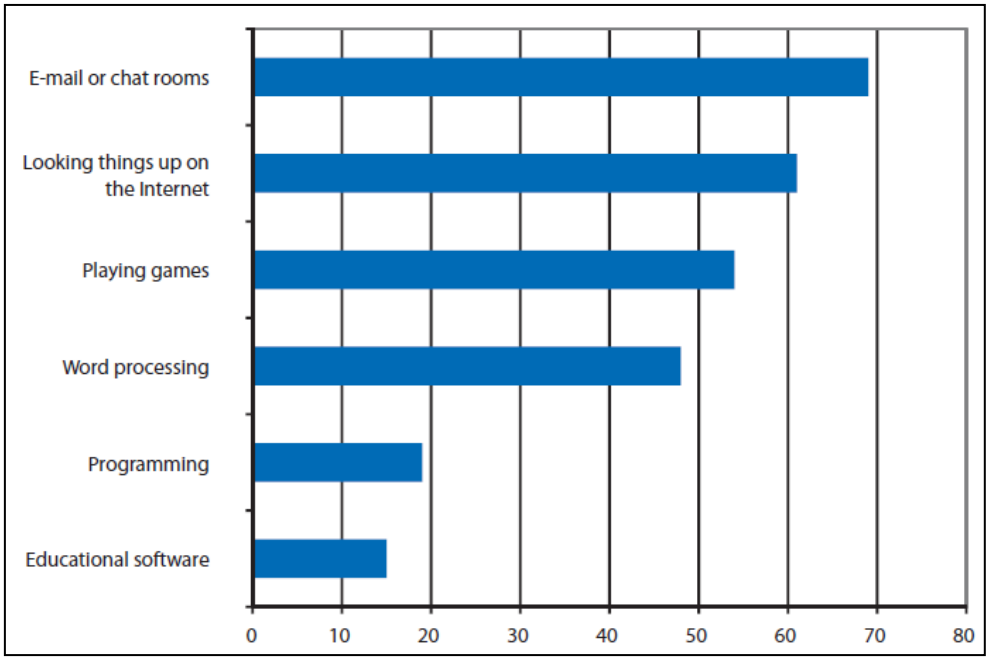


Fig. 16: "Percentage of students who use computers frequently for the following activities".

OECD's StatLink : http://dx.doi.org/10.1787/812016228341.

In other words, a pivotal aspect is the development/training of a "transfer skill" of digital competencies from leisure to educational context.

3.2.2.3.3: Student's use of ICTs: clustering and profiles

One of the most valuable results in the mentioned OECD report is the proposal of students' profiles, generated by clusters' analysis in PISA data, likely to be one of the largest datasets about students worldwide.

In the main findings it is said that "A variety of student profiles are linked to different uses of technology. The six suggested profiles (analogue, digi-casual, digi-wired, digi-sporadic, digi-educational, and digi-zapper) reflect a variety of computer uses which

relate to socio-economic status (ESCS) and gender"(idem, p.12). A detailed description of clusters is presented in the schema below. It must be added that it is forthcoming a publication in which OECD will offer an updated version of those groups using PISA2009 dataset.

	Rare educational	Monthly educational	Frequent educational
Frequent leisure	**Digi-wired (19.7%)** • Male-dominated • Positive ESCS • Medium level 3 score in science • Positive self-confidence Internet tasks • Positive self-confidence high-level tasks		**Digi-zapper (6.9%)** • Male-dominated • Negative ESCS • Level 2 score in science • Positive self-confidence Internet tasks • Positive self-confidence high-level tasks
Monthly leisure	**Digi-casual (18.6%)** • Slightly more females than males • Positive ESCS • Medium level 3 score in science • Positive self-confidence Internet tasks • Negative self-confidence high-level tasks	**Digi-sporadic (3.9%)** • Slightly more females than males • Negative ESCS • Low level 3 score in science • Moderate self-confidence Internet tasks • Positive self-confidence high-level tasks	
Rare leisure	**Analogue (37.7%)** • Female-dominated • Negative ESCS • Medium level 3 score in science • Negative self-confidence Internet tasks • Negative self-confidence high-level tasks		**Digi-educational (1.5%)** • Female-dominated • Negative ESCS • Level 2 score in science • Negative self-confidence Internet tasks • Positive self-confidence high-level tasks

Fig. 17: "Summarising findings about six important students' profiles"
(*idem*, p.95)

The schema crosses the two variables "frequency of leisure" and "frequency of educational uses"; it compares groups at the same time, checking the difference in the following: gender (the first line of every group); positive or negative Economic-Socio-

Cultural Status (the second); science tests' scores in PISA data (the third); level of declared self-confidence in internet use (the fourth); and the level of declared self-confidence in high-level tasks (for details, check the PISA questionnaires on the official PISA website: www.pisa.oecd.org).

It must be pinpointed that the biggest group (almost 2 students over 5) is the "analogue" one, namely the rare users of digital both in educational and leisure aspects.

3.2.2.3.4: Does ICTs familiarity improve students' performance?

The final question is if being familiar with ICTs is a predictor for a better school performance. Two graphs, crossing computer use and performances in science (about home use the first, and school use the second) and related comments are helpful to get the answer.

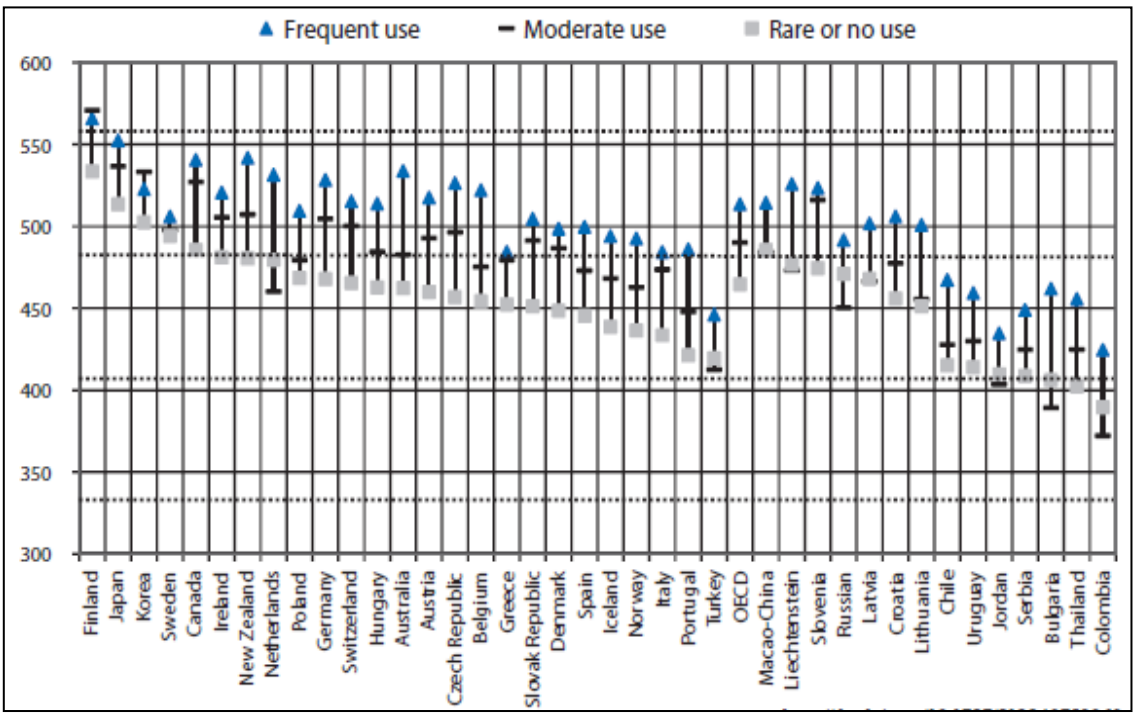


Fig. 18: "Frequency of computer use at home and student performance on PISA science scale".

(Data only for OECD countries that used the ICT Familiarity Questionnaire in PISA 2006)
OECD's StatLink : http://dx.doi.org/10.1787/812240753060.

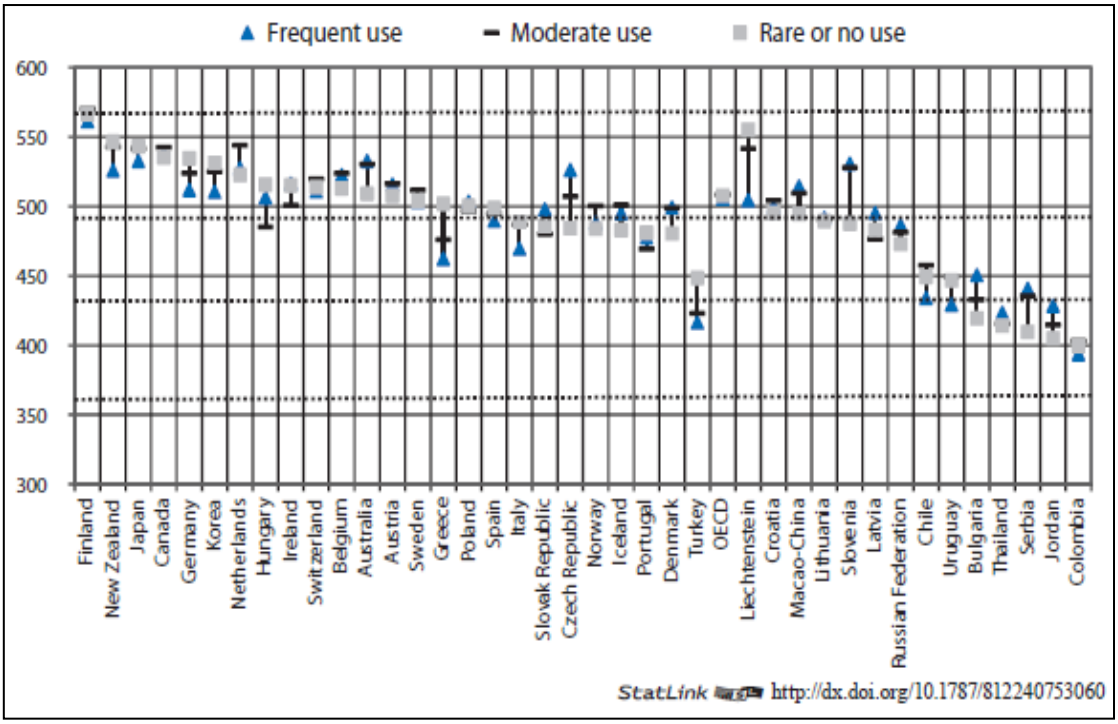


Fig. 19: "Frequency of computers use at school and student performance on PISA science scale"

(Data only for OECD countries that used the ICT Familiarity Questionnaire in PISA 2006)
OECD's StatLink : http://dx.doi.org/10.1787/812240753060

As explained in the text, it is possible to see a clearer correlation for the home use "in every country, students reporting rare or no use of computers at home score below their counterparts who report frequent use" (*idem*, p.128). Though, a relevant number of countries constitute an exception to this effect. Furthermore,

> For frequency of use at school, the association with performance is less clear. In a majority of OECD countries, students with different frequencies of use at school perform very similarly on the PISA science test. In fact, on average in OECD countries, moderate and rare or non-users score the same (508) and frequent users slightly lower (506). It is interesting that the average score is relatively high (above 500 score points) for the three user frequencies. However, in Finland, Germany, Greece, Italy, Japan, Korea, New Zealand, Spain and Turkey, the finding is the

> opposite of that for frequency of computer use at home: that is, more frequent computer users perform less well than less frequent users. In Belgium, Canada, Iceland, the Netherlands, Norway, Sweden and Switzerland, moderate users perform better than frequent and rare or non-users (*idem*, p.130).

Observing the performance's issue in a broader view, it emerges that what explains students' results is a system of inter-related variables (*idem*, p.145), namely: students' characteristics (gender, immigration status, interest in science, motivation to continue learning about science); parents' characteristics (science-related carrier, educational attainments, occupation); household characteristics (home possession, educational resources, number of books at home); school characteristics (number of teachers per student, size of the school, quality of educational resources); and, finally, frequency of computer use.

For statistical analysis concerning other countries (i.e. USA), the whole dataset (and not only data only for OECD countries that used the ICT Familiarity Questionnaire in PISA 2006) is available in the text *PISA 2006, Volume2: Data* (OECD, 2007)

Concluding this second path, it is important to report that:

> The first digital divide has faded in schools but a second one is emerging. In nearly every OECD country, all students attend schools equipped with computers, 88% of which are connected to the Internet. However, there is still a digital gap related to home access. In the light of the results of this study, it can be concluded that the importance of the digital divide in education goes beyond the issue of access to technology .A second form of digital divide has been identified between those who have the necessary competences and skills to benefit from computer use and those who do not. These competences and skills are closely linked to students' economic, cultural and social capital (*idem*, p.13).

That statement expresses a significant level of uncertainty about the theory of a generation of digitalised learners.

3.2.3: Path three: ideologies of the debate. Three different views of the same

The first path presented in this chapter outlines a key feature of the debate, namely the lacking of a diriment contribution, despite more than 20 years of reflections.

Moreover, the second path highlighted that, addressing the topic from a open-ended perspective, a scattered reality emerges; and, it is far from being unquestionable a clear difference, or a set of characteristics attributable only to new millennium learners, respect to the older generation.

Nonetheless, despite the fact there is not enough evidence, a number of educational policies and instructional activities are being set and provided solutions to the needs of the generation of digital learners. How is it possible?

To understand this incongruity we must consider carefully how the discussion elicited a sort of ideological fight around the claimed and expected – or feared, or denied – differences of current learners. This is the reason why, after history and geography, we will explore the path of the ideologies – in a sense, the philosophy of the debate. In fact, analysing transversally any contributions presented so far, three main families of visions and definition can be framed/identified.

These three views represent a sort of compass to get oriented in this jungle. They help in understanding how authors and scholars in the field perceive and define current learners when using ICTs. The key point, in this paragraph, is to underline the following: rhetorical labelling of current learners imply pedagogical and/or anthropological/philosophical assumptions about people – even if not consciously. Rhetorical artefacts are the reason why the growing of attention toward learners and new media did not provided more shared knowledge, rather more disagreement. This is because an ideology get first than scientific evidence; an idea is already in the mind of the researcher, while results have to be uncovered.

For each view, an adjective was chosen to identify it, unveiling the attitude toward the dichotomy explored in this dissertation; they can be:

1. The **enthusiasts** (about the impact of ICTs on learners` skills and behaviours)are firmly convinced that digital technologies are making the generation of younger learners a very skilled one. Within them is it possible to identify three different approaches, depending to the observed area of ICTs' effects on learners behaviours and attitudes:
    a. The **historic-sociological** approach, moving from all the differences between the current generation and the previous ones (e.g.: Howe & Strauss, 2000);
    b. The **psycho-cognitive** approach, claiming that the everyday usages of ICTs changed the cognitive abilities of young people (e.g.: Prensky, 2001; Small, 2008);
    c. The **socio-pedagogical** approach, based on the paradox "everywhere ICTs, except at schools", and asking for a reform/revolution in school and university systems (e.g.: Oblinger & Oblinger, 2005; Junco &Mastrodicasa 2008).
2. The **concerned ones**, almost reactionaries, accepting as well this idea of a digitalized generation of learners, but concerned about the potentially dangerous effects, such violence, dumbness, harassment, addiction, etc (e.g. Bauerlein, 2008).
3. The **critics,** who question the idea of characterising the set of skills of the young generation simply in function of ICTs' usages, criticizing all the unrequested generalizations, and calling for deeper studies and g-localized analyses (e.g. Selwyn, 2010).

The three views are an abstraction; it is considered useful to classify the rhetoric tools used to epitomize today's learners. The following paragraphs are provided to give reason of such abstraction.

3.2.3.1: The enthusiasts

The common belief inspiring this group of authors is the optimistic view about the effects of digital technologies on today's learners, to the extent of considering them a *digital generation* even at institutional level *(The Digital Generation Project, 2009)*; hence the label of enthusiastic view.

In terms of cultural roots, the expressions "digital natives" (Prensky, 2001a), "net generation" (Tapscott, 1998) and "Millennials" (aka "generation Y") (Strauss & Howe, 1991) lead the group. Since they mean similar conclusions, in this dissertation we use the expression *digitalized generation of learners* to refer generically to them.

The keystone of this view is the perception of a fatal/irreducible difference: because of the permeation of ICTs among the younger cohort, the society, the culture, the reasoning, the learning, and the skills could no longer be the same as it was in the past. Beside, education needs to react to this process, providing brand new solutions.

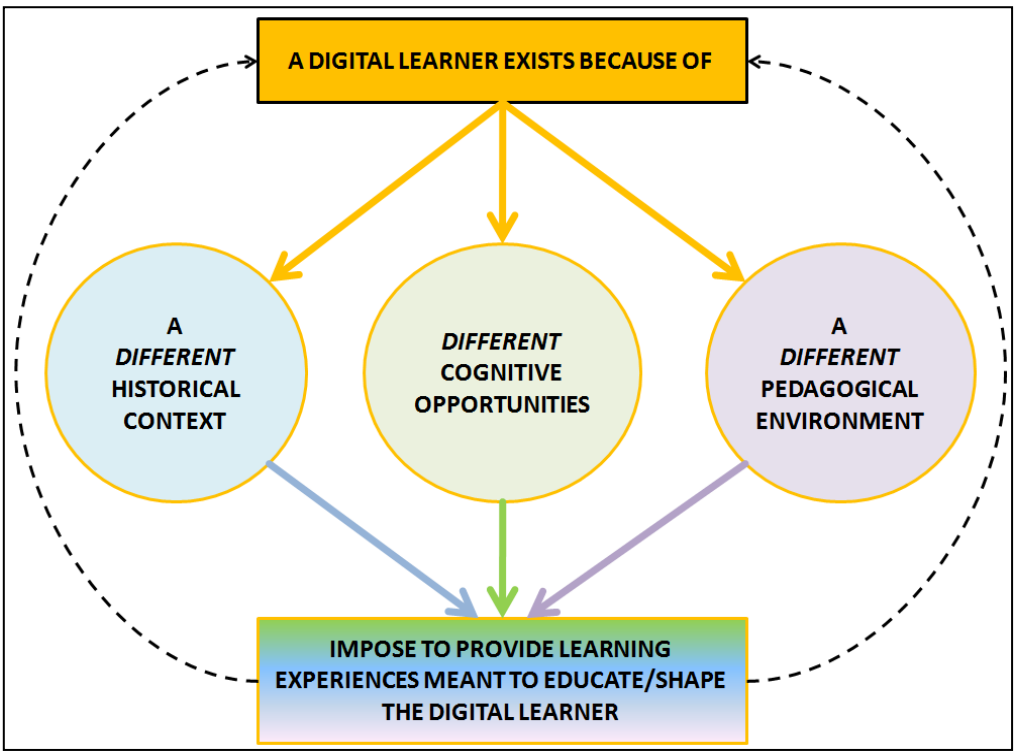


Fig. 20: cause/effect circularity in the digital learners' perspective

The previous picture shows how the condition of digital is both the origin and the goal (the cause and the expected effect) of learning in the enthusiast view. Moreover, it opens to the following three sub-paragraphs. They are meant to show the plurality of voices within the enthusiast views can be characterized according to three main approaches based on the adopted focus. Indeed, enthusiast authors agree that younger people are different, therefore they call for the appearance of the pedagogy for digital natives (Mantovani & Ferri, 2008); nevertheless, thinkers of this group approach the topic observing that they live in a different historical and socio-cultural context, or that they experience a different cognitive style, or they learn in a different pedagogical environment.

3.2.3.1.0: Three sub-approaches in the enthusiasts' view

According to a previous work, it is useful to split the literature into three different approaches: historic-sociological, socio-cognitive, and socio-pedagogical (Rapetti & Cantoni, 2010b).

At this point, it is necessary to clarify why we are using exactly the nouns view and approach. The choice is linguistically-based and it is meant to emphasise an epistemological distinction.

"View" implies a particular/defined look over a topic or a problem; this look is motivated by the position, the belief(s), the vision, and the objective(s) one can chose. The view is unique and exclusive; namely, in the meaning of this dissertation, if I am enthusiast, I can not be at the same time reactionary, neither critic.

An "Approach" is applied to translate a view from the theoretical-conceptual level, to the empirical one. It develops around the tools of observation, the strategy of analysis, and the disciplinary skills; besides it is influenced by what is – effectively – found in the field. It requires a certain flexibility, and different approaches can be fruitful each others. In brief, it is meant to offer a reading over a problem, and it can be described like the comprehension of the real (in both meaning of encompassing and understanding).

In the dissertation, this distinction is adopted to recognise three different approaches among the enthusiastic view:

- Historic-sociological, presenting a long-period analysis of human beings behaviours and showing how much is relevant the interaction with ICTs in creating social practices and skills of the new generations.
- Psycho-cognitive, arguing that the modification is stronger and deeper, namely affecting the way of thinking, not just the way of acting.
- Socio-pedagogical, reflecting mainly on the familiarity of learners with ICTs since childhood and supposing the younger ones developed a specific way of learning, which implies the need to rethink the schooling system(s) and comes along with a reform in teaching and learning theories.

It is remarkable that the impact on sociological behaviours is a common trait, and it is likely to affirm that the sociability implied in media usages is the common denominator of any analysis about current learners' life.

Above considerations apply to this case too. It is clear that three unique and sharp dimensions do not exist: the goal is merely to provide a criterion of abstraction; moreover, it must be noticed that, in many cases, analysts can and must be considered as crossing over into different areas of approach.

All the enthusiasts have the significant merit of having brought to the attention of pedagogists some evidence and urgencies that academics were late to understand, such as the importance of video gaming in education, the relevance of informal learning, and the depth of the ICTs` impact on learning

Hereby follows an analysis in detail of the main inspiring voices and resumed according to the three approaches.

3.2.3.1.1: Historic-sociological approach

The forerunners of the historic-sociological approach are the already discussed Howe and Strauss. As said in par.3.2.1.1, they brought the theme to a wider audience; their analysis of American history is charming and the two expressions “generation y” and “millennials” become, after a little and with a great persistence, very diffused worldwide.

Howe and Strauss’ work had inspired a number of commentators and thinkers. Enthusiasm, in certain cases, is almost faith that discredits their whole research. Indeed, their work constitutes a challenging and inspiring abstraction of historic-social phenomena, with a long-term analysis point of view. Not by chance, even if they support the idea of the “next great generation” and emphasise the positive force of media, their book also unveils – ironically –some paradoxes of the “overconnected generation” (Watkins, 2009), as shown in next picture.

Fig. 21: "Global Kid Chat"
(Source: Howe & Strauss, 2000, p.289)

Among the successors of the historic-social approach, it is necessary to mention the contribution of Junco and Mastrodicasa, with their book *Connecting to the net.generation what higher education professionals need to know about today's students*. In this text, they provide other comments and intuitions based on historical reflections and suggest socio-pedagogical consequences (Junco & Mastrodicasa, 2007, pp.7-13). Particularly, four pedagogical-cognitive characteristics are added to the seven distinguishing traits of millennials. Namely young learners are supposed to be:

- Driven to success: goal-oriented, they want high-rates and prefer to get the best mark instead of criticizing a teacher.
- Social: they love to interact in learning: fewer lectures and more discussions.

- Experiential learners: by learning with PCs, they developed the trial-and-error way of thinking, dislike instructional manuals and like to gather information surfing freely on the internet.
- Multitasking: because of the "development of their learning processes using such technologies, they developed cognitive processing styles that can be described as 'hypertext' in nature".

Another contribution worthwhile to be mentioned is offered by pedagogists Wilson and Gerber, who aimed to explain how Howe and Strauss's generational theory can improve teaching. In the text didactical strategies for working with the millennials are discussed in depth. In their words:

> Without taking Strauss and Howe to be the final word on a generational cohort consisting of over 75 million people, we think these seven characteristics provide an excellent point of departure for anyone seeking to fashion pedagogical schemes that have a chance of avoiding significant pitfalls [...] We have combined Strauss and Howe's (2000) dominant paradigm with our own classroom observations, while including some elements from these other works as they apply to practical pedagogy. We do not want to imply that Millennial preferences or traits should be the only, or even the primary, driving engine behind pedagogical strategies. But we are suggesting that readers consider accounts of those who have been studying the Millennial generation as a generation, contemplate our own suggestions for teaching strategies, and evaluate both in terms of their own experiences with Millennial students. (Wilson& Gerber, 2008, p.32)

3.2.3.1.2: Psycho-cognitive approach

This second approach overlaps the sociological observation of the reality and a neuroscience analysis of current learners.

The psycho-cognitive approach began to gain a strong reputation thanks to the work of Prensky – already pointed out in par. 3.2.1.2.

The keystone of the psycho-cognitive approach is the principle that continuous technology usages change people, to the extent that it creates different and changed kinds of human beings, such the *digitals;* or the h*omo zappiens* (Veen, 2006) suggesting even an anthropological difference:

> There is one thing you know for sure: these kids are different. They study, work, write, and interact with each other in ways that are very different from the way you did growing up. They read blogs rather than newspapers. They often meet each other online before they meet in person. They probably don`t even know what a library card looks like, much less have one; and if they do, they`ve probably never used it. They get their music online – often for free, illegally – rather than buying it in record stores. They`re more likely to send an instant message (IM) than to pick up the telephone to arrange a date later in the afternoon. They adopt and pal around with virtual Neopets instead of pound puppies. And they`re connected to one another by a common culture. Major aspects of their lives – social interactions, friendships, civic activities – are mediated by digital technologies. And they`ve never known another way of life.(Veen, 2006, p.2)

In sum, authors supporting this approach are convinced that everyday familiarity with technology is having an impact on cognitive development; this is due to the fact that young people process information and communicate in different ways and via multiple

channels. The same spirit inspires many other essays, reflecting as well on the impact on thinking skills.

Current learners have been educated in parallel with ICTs fast development and permeation and this could not help to affect people; two books, *Growing up digital: the rise of the Net generation* (Tapscott, 1998), and *Grownup digital: how the net generation is changing the world* (Tapscott, 2009), bear out the evolution of this approach The key message is: digital technology shaped digital kids, now they are arriving at universities and in the labour market and they will change (are changing) the world. In the author's words:

> The bottom line is this: if you understand the net generation, you will understand the future. You will also understand how our institutions and society need to change today (Tapscott, 2009, p.11).

Worthwhile to be noticed: such a positive feeling is a common trait of almost every enthusiast.

On the basis of the inferred implications of the massive exposure to ICTs, it is often concluded that their expectations regarding learning have dramatically changed and these need to be addressed properly by educational institutions and educators.

To exemplify about the assumed difference between "natives" and "immigrants", Seymour Papert (1993) coined the term "grasshopper mind", for the inclination to leap quickly from one topic to another, sometimes back and forth, instead of focussing on a subject. The recurrence of this behaviour makes young learners impatient if sources of information are not instantly at their fingertips; and they spend rarely long time thinking about the same thing. As well as changes in attention spans, the implications of an intensive use of ICTs involves a broad range of thinking processes; for instance the need for instant responses, the habit of multitasking, the focus on multimedia content.

In the book *iBrain: surviving the technological alteration of the modern mind* (Small & Vorgan, 2008) authors discuss the specific ability in managing the load of information

and *stimuli*: on one hand, this is related to the brain plasticity; on the other one, it is enhanced by the hypertext dynamics and the so-called multitasking. It is likely that people who process a continuous stream of data have more neurons dedicated to filtering information. Then, is probable that young people developed more their brain plasticity, since ICTs enhance the continuous data stream and young people are managing such processes more frequently. Also it is possible to affirm that tech-savvy people have a greater working memory (the ability to store more information in the short term), and regulate their perception of the world in response to changing information. Because of that, current learners are able to "make snap decision" and "juggle multiple sensors of input" (that is, what it is improperly called "multitasking"). When compared to people not familiar with digital processing of information, it emerges that "digital immigrants" are step-by-step learners and precisely task executors (Small & Vorgan, 2008).

Finally, it must be highlighted that the major impact of getting everyday more and more familiar with ICTs – absorbing their dynamics – is the speed and the width by which is possible to access and retrieve information.

Moving from all the abovementioned contributions, the common traits of psycho-cognitive approach can be pointed as follows:

- Since early childhood current learners were used to jump from a source of information to another one, behaving like *homo zappiens* (Veen, 2006)with the TV remote controller and developing then a sort of "grasshopper mind".
- Coherently, the computer is their naturally dedicated machine (Papert, 1993), and the non-linear structure of the internet perfectly fits with their mindsets.
- Thanks to the digital *milieu*, young people experienced original strategies to know (e.g.: videogames) and developed different way to think and learn (Prensky, 2006). In a world where any kind of information is mediated by ICTs, they must be considered to be Digital Natives. Following this reasoning, some authors are allowed to claim that this is a generation of people "bathed in bits" (Palfrey & Gasser, 2008, p.39).

- Though, it is something more than just familiarity or habits, because human beings develop *technomorfism*, due to the everyday exposition to new technologies. This word expresses the concept of a physical transformation in which bodies and machines are melt together and even no more separately identifiable (de Kerckhove, 2006).
- In this new context, knowledge is not no longer in brain, neither in sources, but it comes out from the interaction humans-machines: therefore learners of digital era are said to have developed new neural abilities.
- Given this context, scholars and thinkers ask for a school which could be considered by digital natives as a meeting place and no more simply a learning environment, in reason of a fuzzy, immediate, multitasking, and networked new learning style; while school still works by a linear, consequential, monomedial, and individual teaching style (Veen, 2006).
- Other authors are more cautious in considering young learners being part of a specific generation and suggests to consider them – at least – like a Digital Population (Palfrey & Gasser, 2008), whose behaviours are understandable only if considering their digital life.
- Finally, it has been observed that natives and immigrants are not exhaustive concepts and that new technologies create an environment, rather than a country, populated – therefore – by "digital residents" and "digital visitors" (TALL group (Oxford University), 2009).

3.2.3.1.3: Socio-pedagogical approach

The socio-pedagogical approach moves from the paradox "everywhere ICTs, except at schools" (Pedró, 2009); a claim which has a contradictory addendum: because students` pockets are full of digital media; and this creates some didactical inversions in all the cases in which *"students provide correct facts to teacher"* thanks to their digital devices (Tapscott, 2009, p.81).

The idea of a generation of learners who experience differently learning because of the digital context is the core of this approach. Using the classical psycho-pedagogical

distinction: their difference is not in nature, but in culture; anyway, they learn in a brand new way. The novelty comes from the diffuseness of technologies in everyday life, and the way these tools are perceived:

> It is an almost instinctive assumption to believe that Net Gen students will want to use IT heavily in their education; they certainly do in their personal lives. However, if you ask Net Gen learners what technology they use, you will often get a blank stare. They don't think in terms of technology; they think in terms of the activity technology enables. In general, the Net Gen views the Internet as an access tool, a medium for distribution of resources rather than a resource with limitations. […]The activity enabled is more important to the Net Gen than the technology behind it. For example, instant messaging wasn't considered a technology; IMing is treated as a verb, it is an action, not a technology. Students often use the word "talk" when they describe text messaging or instant messaging. Software blends into the background; it enables certain activities to occur, but it is not new, novel, or customizable all part of the Net Gen's definition of technology. (Oblinger & Oblinger, 2005)

Moving from instances coming from reflections close to the above one, enthusiasts sustaining the socio-pedagogical approach propose:

- To introduce ICTs in didactics, both using existing (hardware) devices and inventing new software tools.
- To evolve "classic" didactic in an eDidactic, that is to set didactic comprehending the potential coming from digital world.
- To push and improve an evolution of the relationship between student and teacher training them to be autonomous learner (O. Peters, 2000) and fading tutor. And to

promote pedagogical alliances(Prensky, 2010) based on the mutual exchange of familiarity with ICTs in change of knowledge and educational tools.

Within this group, scholars express a vast range of reading of the dichotomy learners and new media; someone arguments that "the added value of educational software used for the attainment of educational goals can no longer be doubted"(Istrate, 2010). Anyway, at the same time, other researchers agree, but with a more cautious approach; reflecting around the "overestimation of meaning" (Rivoltella, 2011), and putting in light that the software in itself is just a tool, without educational scaffolding and pedagogic project there is no evidence of its efficacy.

The debate is often enriched by reflections concerning the 21stcentury skills, and how the goals and strategies adopted in pedagogy can or can not facilitate the learner in achieving such skills. promoting a "learner–centred didactic"(Trilling & Fadel, 2009).

The book *"Educating the netGeneration"*(Oblinger & Oblinger, 2005)can be considered the foundation of this way to present the topic in educative terms, and the famous work of Tapscott (Tapscott, 1993; 1998; 2009) has the popularization merit. The request of a new didactic often comes along with the request of a *digital school* (Ferri, 2008) in order to update the schools' – and universities (Junco & Mastrodicasa, 2007) – experience to the everyday *digital* life of young generation.

Whether exist a new kind of student is still an open issue, but is a matter of fact that – very often – teachers and educators (and parents) do not feel at ease facing a cohort of students that experience everyday in informal and non-formal learning experiences in terms of different ways to access, build and share information and knowledge (Rivoltella, 2006, pp.198-206).

Moreover, innovators in education are suggesting that new technologies are the necessary step to finally achieve and spread a children-driven learning, forecasting that "in ten years we will face a completely different school"(S. Mitra, Dangwal, Chatterjee *et al.*, 2005, 21(3), 407-426.; S. Mitra, 2010).

3.2.3.2: The concerned ones

Opposed to the enthusiast view, we face the concerned group.

As it usual happens in history facing big changes, two opposed visions arise, expressing a positive and a negative attitude towards what is new. No doubt: ICTs in educational processes are a great challenge; and, while the enthusiasts show a very positive feeling about the idea of a digitalised generation of learners, the “reactionaries” express concerns and worries about this idea. The focus of this second view is totally narrowed on potential dangers of ICTs, from social and cognitive aspects (Bauerlein, 2008), to classical issues such as violence, addiction, etc (MAVAV, 2002).

This view is based on feelings of imminent troubles in society, culture, and learning; often they are disappointed by the young people's behaviours, they believe that the requested autonomy for learner will simply result in them getting lost, and their pedagogical values are mainly based on "it-has-always-been-like-this" methods.

The concerned view pushes the idea that technology has negatively overwhelmed our daily lives; therefore it must be considered like a source of potential dangers. Given this reading of the problem, it is clear that reactionaries refuse and firmly oppose the digitalisation of learning.

Within the group, it has to be underlined the Bauerlein’s position. Indeed, he offers a mirror-reading to Howe and Strauss’ discourse, moving from a similar approach. Concerned authors provide a vision of young people focused on bad experiences, negative practices, and educators’ failures. In many cases, the concerned view involves also education, with a sort of *aut-aut* feeling: If educational institutions do not care to educate with a sober use of ICTs, the possibility of forming aware citizens and mature people is in serious danger.

This view seems to offer a limited knowledge about learners, and the concerned feelings against the evil effects of new media move from an approach that does not take into account the difference between processes of mimesis and catharsis: being audience of

negative messages does not mean necessarily to replicate them in actions (Pateman, 1991).

On the other hand, the accuse about the disadvantage of being constantly connected is important. They put in evidence the need to educate young people to become aware of their self-exposure in time-space, be it online, be it physical.

3.2.3.3: The critics

Critics highlight the weaknesses of the previous two groups. Especially, they argument against the lack of basis and they often ask for contextualized observations, for real usages studies, and for media diet protocols of analysis. Moreover, they strongly criticise researches, in which – naively or fraudulently – young people are asked how much they use ICTs and if they would like to introduce digital in schools/universities. After an obvious confirmation, supporters of digital natives' view state they have a sound empirical basis for their beliefs.

It is hard to sum up the critics' position, since this view is not converging around an idea, but against. Indeed, the critics' view can be split in two sub-groups. Some authors criticise the digital approach at the theoretical level, questioning the way of setting the problem in terms of digital prejudice on education (e.g. Schulmeister, 2010); others focus on the research level, criticizing how the reality is observed in such *naïve* ways (e.g. Bullen, Morgan & Qayyum, 2011), for instance, simply asking young people if they like ICTs.

Though, one can sum up their main claims as outlined in the following section.

3.2.3.3.1: Keypoints in critic view

If the generational gap facing new technologies is accepted without being questioned, it generates an "educational give up" outcome (Bennett, *et al.*, 2008), provoked by the "moral panic" of being no longer able to communicate with someone completely different(Bayne & Ross, 2007).

The concept of "generation" must be related to its proper meaning, while "a bunch of people" is not a generation, even if they use all the same technologies; when considering

data-evidence, the only “media skill” that is undoubtably attributable to young people is the information gathering ability (Schulmeister, 2008; Bayne & Ross, 2007).

Enthusiast and concerned scholars seem to be quite deterministic, because they pretend to describe persons (and their behaviours, habits and beliefs) and to forecast how they will learn and behave, simply based on the evidence that they grew up in a world permeated by technologies (Rapetti, *et al.*, 2009).

The most part of books and articles comes from the United States and it could be a dangerous assumption to extend their analyses a-critically to other countries (Bullen, *et al.*, 2008-present).

This perspective is deeply influencing instructional designer all-over-the-world, and it is possible to find a significant number of contributions about “how to teach people in the digital era” which, again, have to be proved effective and sound in very different contexts (Bullen, Morgan & Qayyum, 2011).

Often, this kind of approach implies with gross generalisations and stereotypes (Bullen, Morgan & Qayyum, 2011). And it seems to be more a matter of usages and familiarity than of generational attribution (Gamero, 2010); moreover, no research shows generation of designers, nor creative people, nor surprising media users(Selwyn, 2009), neither engineers; and it must be observed that the claimed multitasking did not arrive, rather we have to face the attention deficit problem (Sigman, 2008).

In pedagogy, it would be better to refuse a medication-for-all-ills style based on methodological enhancements without consider them in a broader anthropological reflection of human beings; the risk is to narrows the sense of learning, to reduce teaching to a simple set of methods.

The characteristic of “digital” fits well for objects, but it seems to be inaccurate if referring to human beings. More, it has become a fashion concept because it is very appealing and – today – everything risks to be called “digital”(Rapetti & Cantoni, 2010b).

The high usages of ICTs by young people in OECD countries in itself is a neutral information that does not allow any direct consequence on the learning level and their preference to use digital devices for leisure purposes must be observed deeper (Kolikant, 2010).

More than one author remark that school (and university as well) is a learning- and knowledge-*fabrica* (Latin word standing for manufacture), not simply a place which needs to be updated with *chic* novelties. To foreseen the future of learning and teaching, it seems unfruitful to ask students if they have, use, and like ICTs (the answer is likely to be known in advance), but to understand (educators and learners together) if and when ICTs are useful in their learning processes (Kolikant, 2010).

3.2.3.3.2: The debate after critics

Thanks to this third view, the debate – that was already hot – started to glow. Not really with clear advantages. Teachers, every morning entering in their classrooms, can choose to face a generation of tech-savvy guys, or to fight against a bunch of brainless digital-addicted people, or to wait until researches have demonstrated how to label young learners.

A good example of the weaknesses of the generalisations implied in the digital natives approaches concerns the usages of videogames: if we compare kids from United States and from (the average of) Europe (MEDIAPPRO, 2006, pp.14-15; Tapscott, 2009, p.50), we learn that American children have a greater exposition to videogames, while European children are more likely used to own a mobile phone (often more than one) since childhood. Such a big difference in the familiarity with digital tools, according to critics, reduce the credit given to Prensky`s theses.

At the same time, it is true that videogame usages is rapidly and constantly increasing worldwide; mainly because of the diffusion of multimedia online gaming (Livingstone & Drotner, 2008). Enthusiasts cheer for this fact, stating digital games are useful to stimulate brains and we should create computer software to teach school disciplines; while reactionaries denounce the increase of online addiction and consequent hypothetical loss of mental quickness.

The critics view is not without limits: the most important refer to the popularisation difficulties, since sceptics – often – offer very deep analysis, using an academic language, and not enchanting in the sense that "marketing of ideas" could spread this view. On this purpose, it is remarkable that almost all the enthusiasts exposed their theories in books with – in some cases – a big audience, while all the critics, so far, just published journal papers for experts in the field; this problem forces to take in mind the debate around the "No Significant Difference Phenomenon" (Russell &North Carolina State University, 1999).

Reasonably, the cautious attitude expressed by Higgins (2003) in his review of the evidence on the impact of ICTs on students' attainment is still the most universal conclusion about learners and new media:

> there is evidence from research that ICT can help pupils to learn and teachers to teach more effectively. However, there is not a simple message in such evidence that ICT will make a difference simply by being used. Findings suggest that, although ICT can improve learning, there are a number of issue that need to be considered [...]. There are two main issues. First is the modest effect of ICT compared with other researched interventions, second is the almost negligible effect of the provision and use of ICT at a general level (Higgins, 2003, p.5).

3.3: The label issue

The third paragraph will put in evidence a very diffused habit – strictly related to the ideological approach to the debate – namely, the labelling procedure.

Since the beginning of the debate, voices obtaining the bigger audience and fame were the ones providing a catchy and effective label/expression able to concentrate all the implied reflections. Labels are so important in our analysis because they are powerful, they answer to an – anthropological – need: naming unknown things and phenomena.

Though, labels are not neutral; they limit and tune the observation around the ideas carried by the expression; and can drive the attention away from other issues. To get an example: if the *New Millennium Learners* label (conceived at the OECD) was the *OECD New Millennium Learners*, economical and geographical controversies of adopting ICTs in learning would be immediately reminded.

Moreover, there is an essential difference between using a label in scientific and common language. Scientists have the duty to argument and motivate their linguistic choices; therefore, even if adopting a label which implies gross weaknesses, authors do not adopt automatically those weaknesses in their research; this is because scholars have the chance to unveil the eventual ideological drifts behind that expression. But, if the same (not really consistent) label become of public domain and common usage, it is likely to spread the ideological implications in a non-conscious way.

To get more clear, behind any label there can an ideological view, which is better to identify in order to correctly address the problem.

3.3.1: A plethora of labels

The labelling procedure is in constant evolution. The following list is not meant to be exclusive, though it is presented to get an idea of the state of the art in the debate: Boomer babies; Boomlets; Born digital; Coddled, adrift, and slackers; Digital kids; Digital Natives; Digital residents; Dumbest generation; Echo Boom; Gamers; Gen.com; Generation Next; Generation Tech; Generation Why; Generation XX; Generation Y; Generation 2000; Grasshopper Minds; Homo Zappiens; Instant-Message Generation; Millennials; Narcissist; Net addicted (to pointless activities);Net-agers; Net generation; Next Great Generation; New Millennium Learners; Nintendo Generation; Prozac Generation; Screen Generation; Shameless; The ones who click (instead of thinking); The ones who take Google as Gospel; Violent and online bullies…

3.3.2:A taxonomy to discern rhetoric implied by labels

It is nothing but irrelevant, trying to discern within the above plethora of expressions; such corpus of labels communicates the great attention toward the dichotomy learners and new media.

Analysing the list in depth, it emerges that in literature a variety of causes are offered to state that the young people are different; anyway, it is possible to merge them under umbrella-categories. Therefore, aiming to specify and deepen the taxonomy process, eight different causes have been abstracted from the whole (Rapetti, 2011). The distinction between effects and impact is arbitral: in this taxonomy effects concerns individuals, while impact refers to the society.

1. Effects of digital familiarity/behaviours: changes in learning-related behaviours due to the presence of digital in social activities.
2. Effects of digital routines/behaviours: changes in cognitive processes and behaviours due to the presence of digital in everyday life (psycho-cognitive approach).
3. Generational characteristics: socio-cultural differences among generations.
4. Impact of digital environment: societal changes due to digital context affecting everyone.
5. Impact of digital familiarity: societal changes due to digital experiences affecting particularly young people.
6. Impact of internet: specific focus on spread of the "network logic" and internet experiences.
7. Millennium turn: specific focus on the historic-cultural aspects of the millennium turn.
8. Technological development: specific focus on the overall impact of technological development over society.

Of course, previous eight points are anything but an arbitral abstraction and they have been elaborated in function of the aimed taxonomy. Only a previous work tried the same (Barrio, Medina, Arroyo *et al.*, 2010). If this procedure is worthy, it will be possible to

improve it and sharp such points in a more precise way. The merit of the presented list is to offer a first, original, and scientific strategy to merge many different contributions, according to their common conceptual roots.

Since discourses around the digitalised generation of learners are, very often, based on rhetorical choices, it is not possible to perfectly define every single position. Reasonably, any theoretical contribution refers to the closer ones, but adds distinctions and features. Moreover, all the empirical researches made in this field follow different protocols, and aim to similar (but not congruent) research objectives. One can find many differences in those studies: the questionnaire built to explore the digital attitude of students in a certain area (or institutions); the case-study aimed to improve didactics; the evaluation phase after a period of implementation; and so on. All in all, it is not immediate to discriminate what is precious, even if is just an insight, and what is diverting, even if strengthened by a robust dataset.

3.3.2.1: Labels proposed by enthusiasts

Following this criterion, the most diffused ways to consider young people have been analysed. In the following table, readers can find: the list of the most famous, relevant, and common labels used by the group of authors defined as “enthusiasts”. The table is structured in order to answer the above question in this way: if I use a certain expression (first column) to identify learners, on which assumptions (second column) am I establishing the difference? In the third column, there is the list of texts where those labels have been retrieved. Over 25 cases, 10 comes from the same reference; this is because authors provide a diverse review of some labels, diffused in oral or blogging or newspaper communication (mainly in US).

Tab. 5: the most diffused enthusiast labels to identify current learners and rhetorical implications

Label (alphabetical order)	**Focuses to state the "difference"**	**Reference**
Boomer babies	Generational characteristics	(Howe & Strauss, 2000)
Boomlets	Technological development	(Howe & Strauss, 2000)
Born digital	Impact of digital environment, Effects of digital routines/behaviours	(Palfrey & Gasser, 2008)
Digital kids	Generational characteristics, Impact of digital environment	(Mantovani & Ferri, 2008)
Digital Learners	Generational characteristics, Impact of digital environment	(Brown, 2001)
Digital Natives	Impact of digital familiarity, Effects of digital routines/behaviours	(Prensky, 2001a)
Digital residents	Impact of digital environment	(TALL group, 2009)
Echo Boom	Generational characteristics	(Howe & Strauss, 2000)
Gamers	Effects of digital routines/behaviours	(Carstens & Beck, 2004)
Gen.com	Impact of internet, Generational characteristics	(Howe & Strauss, 2000)
Generation Next	Generational characteristics	(Howe & Strauss, 2000)
Generation Tech	Generational characteristics	(Howe & Strauss, 2000)
Generation Why	Generational characteristics	(Howe & Strauss, 2000)
Generation XX	Generational characteristics	(Howe & Strauss, 2000)
Generation Y	Generational characteristics	(Strauss & Howe, 1991)
Generation 2000	Millennium turn, Generational characteristics	(Howe & Strauss, 2000)
Grasshopper Minds	Effects of digital routines/behaviours	(Papert, 1993)
Homo Zappiens	Effects of digital routines/behaviours	(Veen, 2006)
Instant-Message Generation	Effects of digital routines/behaviours, Generational characteristics	(Lenhart, Rainie, & Lewis, 2001)
Millennials	Millennium turn	(Strauss & Howe, 1991)
Net generation	Impact of internet, Generational characteristics	(Oblinger & Oblinger, 2005)
Net-agers	Impact of internet, Generational characteristics	(Strauss & Howe, 1991)
Next Great Generation	Generational characteristics	(Strauss & Howe, 1991)
Nintendo Generation	Effects of digital routines/behaviours, Generational characteristics	(Soloway, 1991)
Prozac Generation	Generational characteristics	(Howe & Strauss, 2000)
Screen Generation	Effects of digital familiarity/behaviours, Generational characteristics	(P.C. Rivoltella, 2006)

As final remark on the table, another label is “Don’t label us Generation”, suggested on a forum meant to investigate which was the favourite label by young people (Howe & Strauss, 2000, p.23).

The goal of this chapter is not to demonstrate whether the above authors (and their proposed labels) are wrong. *Vice versa*, the taxonomy aims to show what their visions have in common and which are the most stressed rhetoric *topoi*. Actually, we can observe a big predominance of attributed generational characteristics to young people, followed by assumptions regarding the impact of everyday usages on behaviours, skills, and cognitive abilities.

3.3.2.2: Labels proposed by concerned ones

Taxonomy is applicable also to the reactionary view’s labels, and it is possible to identify about five different rhetorical focuses:

1. (Bad) effects of digital behaviours, namely the social outcomes of routinely digital experiences.
2. Change in behavioural skills.
3. Change in cognitive skills
4. Generational characteristics (this point is the converse equivalent to the nr.3 of enthusiasts).
5. Media violence.

It is clear that everything said about the enthusiasts’ correspondent list has to be repeated here.

What emerges strongly from the above five points is the great power attributed to ICTs: digital means are able to change people considered mainly as a passive audience.

The following table lists of the most diffused ways to describe young people by the reactionaries’ group.

Tab. 6: the most diffused reactionary labels and rhetorical implications

Label	Rhetorical focus	Reference
Coddled, adrift, and slackers	(Bad) effects of digital behaviours	(Damon 2008)
Dumbest generation	Generational characteristics	(Bauerlein 2008)
Narcissist	Change in behavioural skills	(Twenge *et al.* 2008)
Net addicted (to pointless activities)	Change in behavioural skills	(Mothers Against Videogames Addiction and Violence 2002-2006)
Shameless	Change in behavioural skills	(Durham 2008)
The ones who click (instead of thinking)	Change in cognitive skills	(Brabazon 2002)
The ones who take Google as Gospel	Change in cognitive skills	(Keen 2007)
Violent, online bullies	Media violence	(Mothers Against Videogames Addiction and Violence 2002-2006)

If compared to table 5, labels expressed by reactionaries are adjectives (or actions used likewise cognitive-sociological descriptors). This reveals an attitude closer to a description, rather than to an interpretation of the problem.

3.4:A strategy to limit the weaknesses of labelling and ideological approaches

In order to get oriented in debate it has been decided to focus on the most inspiring voices, namely the ones which occur more often or are most cited. Then, two converging strategies have been exploited: the first step was the elaboration of taxonomy, meant to merge in groups/families the contributions closer each others; the second step revolves around the analysis of the common linguistic/rhetoric artefacts. The belief is that

taxonomy can help us in better setting our view about learners and properly design instruction.

3.4.1: Schemas to navigate within the rhetoric

3.4.1.1: Systematisation of rhetorical artefacts and trends: a flowchart and a map

In conclusion of this chapter, two theoretical artefacts are offered. They are both syntheses of the rhetorical artefacts and trends dominating the literature and analytical tools

3.4.1.1.1: The flowchart to discriminate views and approaches

The following picture shows the flowchart behind the structure of this chapter and its review of artefacts and trends. It is also useful to set any upcoming new reference. As said before, we put an arbitral distinction between views and approaches.

A view is a (theoretical) pre-understanding. While an approach is the (empirical) comprehension, and it implies a/more focus/es.

In the analysis proposed in this dissertation three views have been identified around the existence of a generation of digitalised learners: both the enthusiasts and the concerned ones agree on. The former consider positively the emergence of digital learners, while the latter express a concerned view; on the contrary, the critics do not accept this, considering inappropriate to label persons with adjectives related to digital. The enthusiast view is further split into three approaches: the first one focuses on the analysis around social aspects facing a generation of digitalized learners; the second approach offers a description more related to historical changes; finally, the third one revolves around the pedagogical issues implied by the existence of digital learners. As abovementioned, also the concerned view could be split into the three approaches; this analysis is not offered since it would be useless.

The keystone of this dissertation is to suggest the following attitude to the topic: to refuse adopting one of those labels when referring to today`s learners, since all of them provide useful, important, and inspiring pieces of knowledge, but imply unrequested generalisations and/or exaggerated simplifications, pushed by rhetorical strategies.

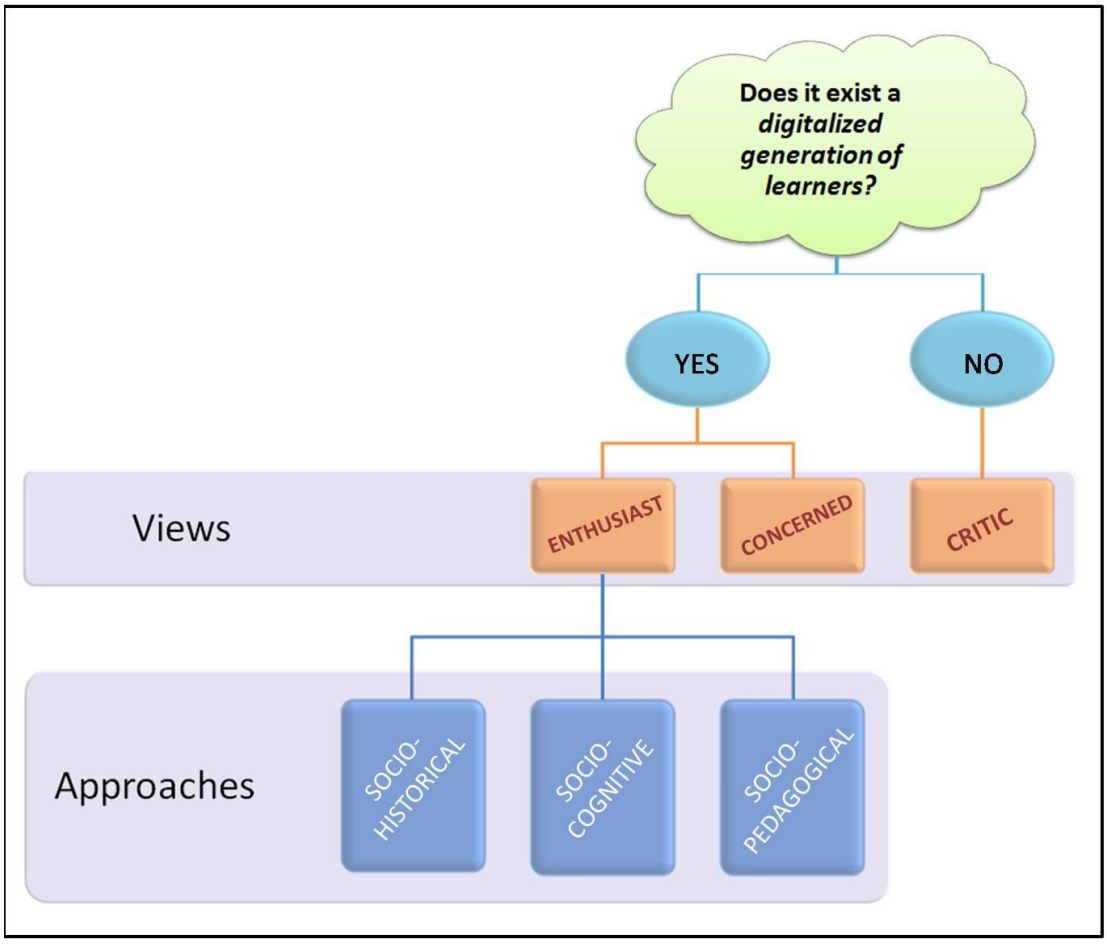


Fig. 22: the flowchart to collocate all the possible reference about digital learners

3.4.1.1.2: Three main disciplinary focuses and related approaches

As discussed in a previous work (Rapetti & Cantoni, 2010b) and presented in sub-paragraphs above, it is possible to split the enthusiasts in three sub groups, in regard to the adopted approach to observe the young generation facing ICTs: historic-sociological, socio-cognitive, and socio-pedagogical. It is worthy to be noticed that the impact on sociological behaviours is a common trait; indeed it is undeniable the role of ICTs in creating new possibilities to access knowledge in the social arena.

Working on the difference between all the labels attributed to nowadays learners, it has been elaborated on a map. This map might be useful for three reasons: first, it offers an overview of the enthusiast view (which is the most diffused one); second, it shows at a

glance the prominence of the social approach in the analyses run by scholars belonging to this group; third, it suggests at the same time the usefulness in distinguishing between the three different approaches and the limits of such an abstraction.

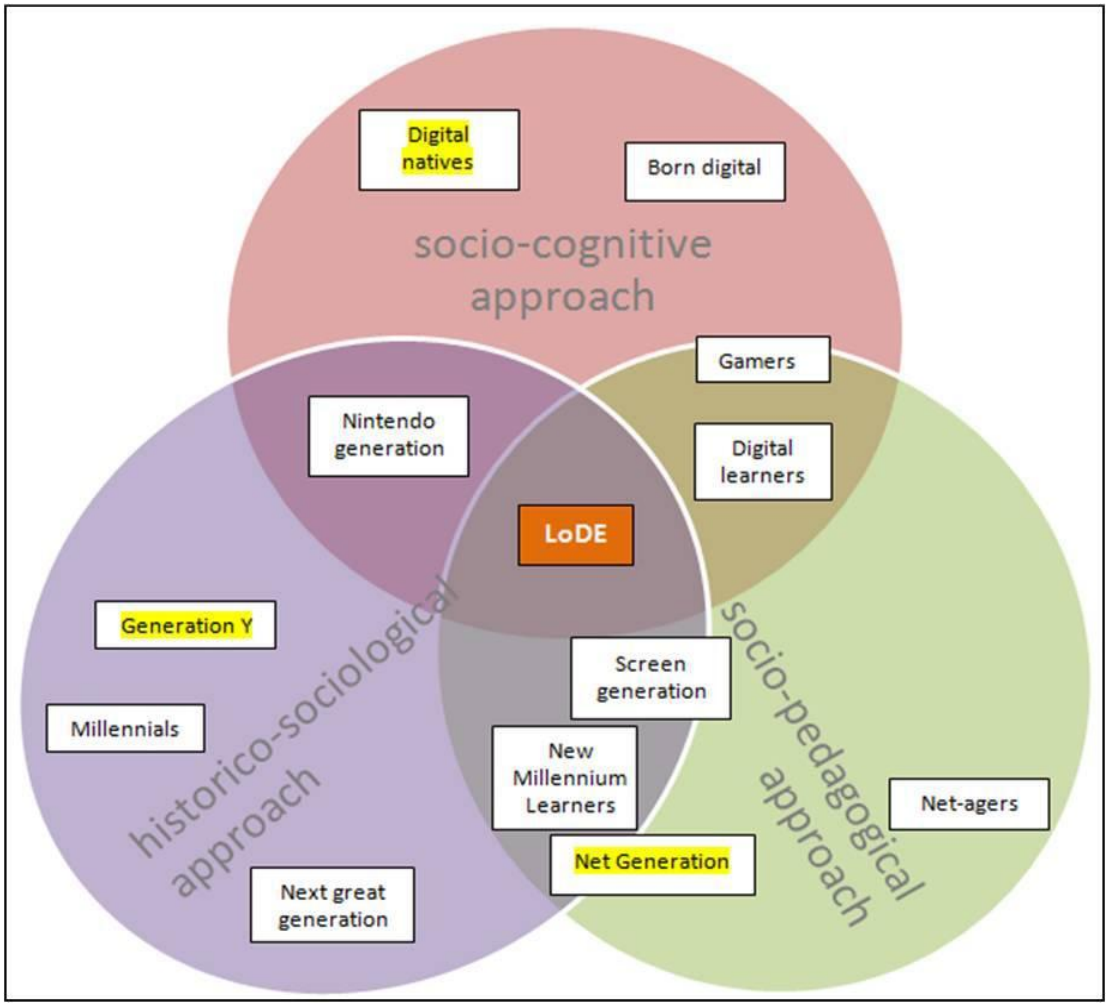


Fig. 23: three approaches to young learners

(Source: Rapetti & Cantoni, 2010b)

Indeed, it is clear that this abstraction constitutes merely a useful schematic sketch of the theses presented here. It has to be said precisely that three unique and distinctive dimensions do not exist: the main focus of the authors was to provide a criterion of abstraction; moreover, it must be noticed that, in many cases, analysts can and must be considered as flowing between different areas of approach.

All the enthusiasts have the significant merit of highlighting some evidence and urgencies that academics were late to understand, such as the importance of video gaming in education, the relevance of informal learning, and the depth of the ICTs` impact on learning.

Both the above images (the flowchart and the map) are necessary to build the comprehensive perspective shown in chapter 4.The word in the middle of the map is LoDE, standing for Learners of Digital Era, which is the label suggested by this dissertation.

3.4.2: Valuable hints from ideologies

Very important, it must be avoided a meta-ideological approach, namely to build a ideology-against-ideologies. This dissertation is meant to criticise the rhetorical artefacts, but this process does not imply to refuse all the valuable hints coming from the different ideological approaches, neither the controversial idea of a generation of digital learners.

Summing up, the rationales which sustaining the generational theory are the following:

1. People born, in average, after 1980 have been adopting massively digital technologies and getting always connected. In order to understand the cultural prominence over the eighties, it must be remembered that the “person” of the year 1983 was a personal computer.

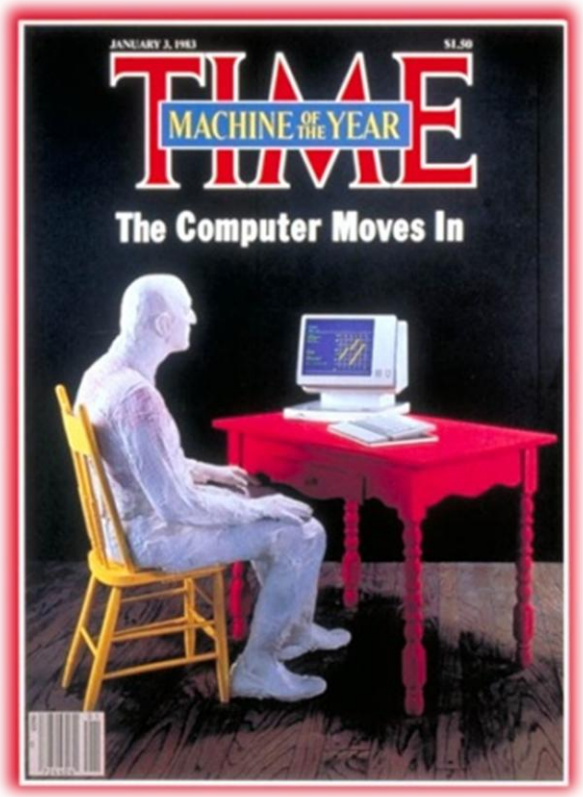


Fig. 24: TIME's cover, 3rd January 1983
(Source: Rosenblatt, 1983)

2. Their socialisation and their relation to knowledge and communication take place in a context permeated by digital media.
3. Their everyday familiarity with digital media has an impact not only on their technology-related skills but, more importantly, on their social and learning skills.
4. This impact makes their expectations regarding teaching and learning radically different from previous generations.
5. Therefore, education systems and educators should change to accommodate these new expectations and provide engaging learning experiences.

In brief, since the young generation have a different everyday life because of ICTs, they are supposed to have a different cognitive experience, even "different brain structures" (Prensky, 2001b, p.1). Given this global understanding of the topic, it is possible to recognise the three different views.

Taken all together, the views constitute an interesting – even it not internally coherent – corpus of knowledge about current learners. If overcoming the ideology, it is feasible to abstract from each view valuable hints to set a pedagogy for the 21st century.

3.4.2.1: Lessons learned from historic-sociological approach

Probably, the most useful point is to take into account that ICTs' advent in History constitutes a big novelty. This is a useful brick for building an accurate perspective to comprehend the learners of digital era. Utilising the seven distinguishing traits might be helpful in contributing to develop a toolkit of skills. This need to be verified and customised when it is adopted in contexts different from the American one.

3.4.2.2: Lessons learned from psycho-cognitive approach

For sure, solid and non-doubtable evidence on the existence of a *difference* in brain processes must be investigate in depth. Thus, it is remarkable that there is a mutual influence between brain plasticity and dynamics related to ICTs usages; since it is true that, on average, young generation have a stronger exposure to these dynamics, it is likely to say that young learners' way of thinking is more in tune with hypertext and multitasking activities. However, to feel familiar with the digital environment seems to be a better explanation than age variable (as *techno-morfism* supposition suggests).

3.4.2.3: Lessons learned from socio-pedagogical approach

It has to be promoted the idea of innovating learning and teaching practices because children and adolescents master the use of their digital tools to enhance their access to sources of information. This does not mean at all to simply introduce new media in education, but rather to educate through new media. This is why a comprehensive perspective about current learners is useful and needed, as the first step to elaborate a shared and sound eDidactic (that is meaningful only when customised for specific given contexts), based on the alliance between an educator pedagogically expert in knowledge provision and more and more autonomous learners.

One of the most important key concepts promoted by the enthusiasts as a whole group can be understood in terms of emphasising and exploiting the digital know-how of current students. According to many of them (Tapscott, for instance) this calls for revolution in pedagogy.

3.4.2.3.1: Frameworks to establish a digital natives-oriented pedagogy

The foundation of the pedagogy for the third millennium is actually at its beginning, and thinkers struggle in between everlasting education practices and prompting new challenges due to digitalised *milieu*.

According to chairs of the "partnership for 21st century skills" consortium, core subjects and themes typical of this century are the basis for all the others skills, split in three different areas: life and career skills; learning and innovation skills; information, media and technology skills (Trilling & Fadel, 2009, p.119). Taken for grant that education must change because learners have changed, it must be cleared how such core subjects relate to the new generation of learners.

Teacher-directed	Learner-centered
Direct instruction	Interactive exchange
Knowledge	Skills
Content	Process
Basic skills	Applied skills
Facts and principles	Questions and problems
Theory	Practice
Curriculum	Projects
Time-slotted	On-demand
One-size-fits-all	Personalized
Competitive	Collaborative
Classroom	Global community
Text-based	Web-based
Summative tests	Formative evaluations
Learning for school	Learning for life

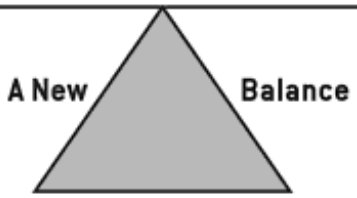


Fig. 25: "21st century learning balance"
(Source: Trilling & Fadel, 2009, p.38)

A caveat to comment on the above figure is essential. None of the points listed on the right is really new. Educational reformers discuss similar topics since the beginning of 20th century, with the Activism; and, concerning the adoption of new technologies, they have been arguing for this kind of shift for the nearby thirty years (see for example: Scurati, 1983, 2010)

In the most recent book written by Marc Prensky – "Teaching digital natives: partnering for real learning" – the focus is put on strategy; namely, what has to change is the process of knowledge transmission. Students must be let free to experience the following:

- Finding and following their passion
- Using whatever technology is available
- Researching and finding information
- Answering questions and sharing their thoughts and opinions
- Practicing, when properly motivated (e.g.: through games)
- Creating presentations and multimedia (Prensky, 2010, p.13).

Coherently with the above list, Prensky underlines that the student must respect the partnering deal with the teacher. Thanks to this deal, learner is involved in the education process, playing the following roles: researcher, technology user and expert, thinker and sense-maker, world-changer, self-teacher. Parallel to this, the teacher's roles are: coach and guide, goal setter and questioner, learning designer, context provider, rigor provider and quality assurer (*idem*, pp.17-25).

As the thinker remarks, this pedagogical framework – the "partnering" – is above all a *caveat* against an old-styled and boring didactic, because "today's students want to learn differently than in the past" (*idem*, p.3). Indeed, also Prensky admits: such ideas are the same as inspiring many other important pedagogical trends (*idem*, p.15).

According to Prensky's advices, also in Europe the foundation of the pedagogy for digital natives is on pedagogists' agenda. The rationale is to adapt schools and universities to their cognitive style, which is anthropologically different, and can be described as following:

> They use a logic that is closer to that "abductive" of Peirce, and not the Galileian inductive/deductive logic. [...] They learn from mistakes and through exploration, rather than through an historical or logical systematic approach. Moreover, they are radically different in comparison to us [the Gutemberg-styled generation of learners]; this is due to sharing with peers, cooperation, the use of different approaches to the problem, and the various codes and plans to solve it. An "open source" and cooperative approach to sources of knowledge that is well

> represented by the way in which young people share music, knowledge and experiences online through many different digital communication tools on the web (Ferri, 2008, pp.27-28, translation from Italian).

One open issue is if they are really so different; actually, many European pedagogists are adopting a conservative/concerned vision on the topic, questioning the lack of scientific evidence to claim this anthropological difference. Such problem is important, because its solution orientates the pedagogical pushes and trends for the future. Nonetheless, this kind of contributions to the topic is not based on evidence, rather on inspiring intuitions about education today, as we will see later.

Enthusiasts answer that the difference is absolutely clear if observing how young children shape their learning experience thanks and through ICTs. Besides, it is acceptable that Prensky's theory can not be adopted *talis qualis* in Europe, but this is ascribed to the little cultural retard if compared with US. According to this vision, the (European) generation of "digital kids" starts after 1996 (first commercial browsers were released in 1995) and, anyway "they are an appearing species" (Ferri, 2009; Ferri, 2011). As if to say, digital natives: if there were not, they should be invented

3.4.2.4: Lessons learned from concerned (almost reactionary) view

This view is, probably, the less useful to adopt a wise perspective about nowadays learners, since it is essentially a description of cognitive-social "dark sides" of media usages by adolescents. Nonetheless, it is important to take into account that: firstly, there could be a sensible resistance to adopt new technologies in learning processes (and this must be considered when setting a policy); secondly, usages of new media without educative compasses could mislead the young generation to activities that could be considered wasting or even damaging.

This second view is also useful in order to understand how the opposition between different visions can become ideological and completely fruitless: according to the

enthusiast Tapscott digital natives are “the smartest generation-really” (Tapscott, 2009, p.311), while the reactionary Bauerlein describe them as the “dumbest” one.

Brought to the extreme, both enthusiastic and reactionary views produce a deterministic and narrowed reading over a complex topic. *In medio stat virtus*, and it is true that relationship between humans and machines is a dialogical process, rather than a direct transfer, as the following picture ironically shows.

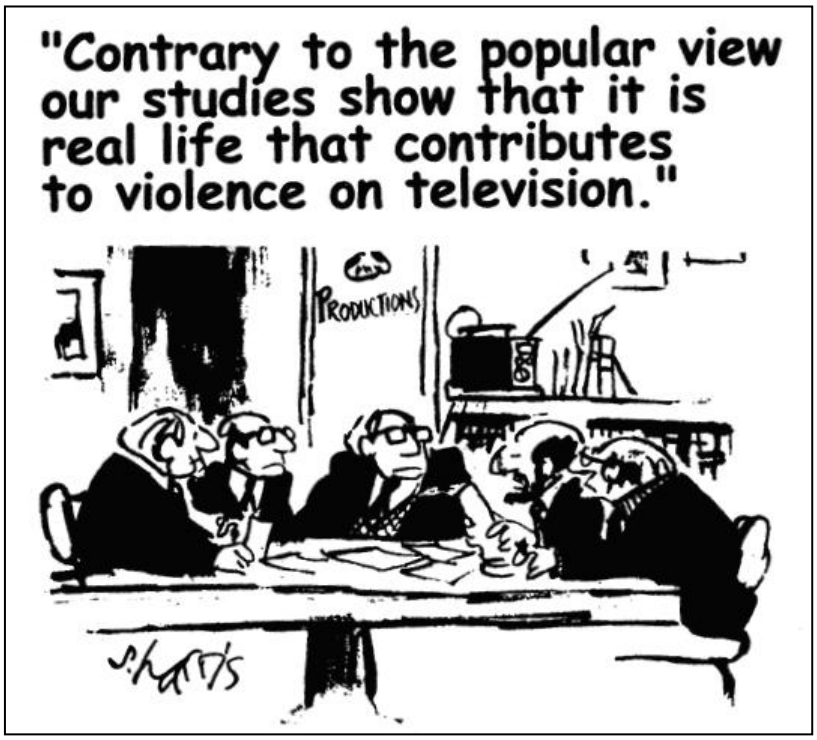


Fig. 26: “Violence, real life and media”
(Source: Strasburger, Wilson, & Jordan, 2008, p.182, copyright of S. Harris)

The third view, more recent, arose exactly because of limits and deterministic drift of some enthusiasts and reactionaries.

3.4.2.5: Lessons learned from critic view

All the weaknesses highlighted by critics must be taken into account for developing a mature perspective about educational policies. The assumption of the existence of a

digitalised generation of learners could be a diverting, inaccurate, too simplistic, and disrespectful generalisation.

The critics' view points to the philosophical dispute between nominalism, realism, and conceptualism; the turning point is to realize whether the word itself owns an intrinsic power: if not, any label can be put onto anything without problems; but, if yes, the attribution of adjectives to nouns must be a very cautious process. Moreover, all the words can bear a metaphorical added value, which can be either useful or diverting.

3.4.3: Benefits of overcoming ideology

Concluding this chapter, it might be added that overcoming an ideological approach toward the dichotomy learners and new media allows to get not simplistic and open-ended solutions. Such as the following one, proposed by the Joint Research Centre of the European Commission:

> [...] investing in ICT without having created a receptive environment (i.e. ICT qualified teachers, ah hoc educational resources) or without having identified complementary variables (i.e. family socio economic status, home computer availability, ICT familiarity, science general or future-oriented interest) may have a negative or no effect on students' achievement. This considerations lead to the conclusion that to maximise the impact of ICT on students performance it is necessary to adopt an holistic policy approach that acts simultaneously at three levels: (i) student and families, (ii) schools and (iii) country (Rizza & Loi, 2010, p.684).

Thanks to the journey through different paths, various labels, many views and approaches, this chapter has described how rhetoric is important in the debate around learners and new media. Keeping track and taking profit of everything valuable, the thesis now moves to the establishing of brand new perspective, namely, the Learners of Digital Era.

Chapter 4: The LoDE (Learners of Digital Era) perspective

Given the issue discussed in chapter 3 about the rhetoric implied in the literature review – and its internal strong oppositions – the need of a broader and comprehensive research perspective emerges. "Broader" in the sense of overcoming the ideologies about a digitalized generation of learners, and "comprehensive" in the sense of saving what is worthwhile from all the contributions.

The chapter will present the LoDE (Learners of Digital Era) perspective, which aims to accomplish the abovementioned goal, inspires the whole dissertation, and constitutes the premise and architecture for part 2.

Paragraph 4.1 is devoted to explain why a new label is provided, and which theoretical implications come along.

LoDE aims to be a "non-labelling label", and to comprehend all the valuable aspects highlighted in previous chapters. The second paragraph presents this perspective, and discusses its role in the practice of research.

The above issues have been presented and discussed in the following paper (co)authored by Emanuele Rapetti:

- OECD-CERI. (2012 - forthcoming). *Connected minds: Technology and today's learners.* Paris: OECD-CERI (Centre for Educational Research and Innovation).
- Rapetti, E. & Cantoni, L. (2010b). Exploring the added value of digital technologies and eLearning in higher education from learners' perspective. A research informed by a systematized literature review. In *Edu-Learn 2010 Conference Proceedings* (pp. 1403-1412). Barcelona, Spain.

4.1: Why a new label?

The ambitious aim of this research is both speculative and pragmatic: to propose a new, coherent, comprehensive, and inter-subjectively appreciable perspective to consider and analyze current learners facing ICTs. In order to do that, a new label to identify learners is suggested. Behind this label, there is a specific perspective of analysis, which approaches the topic with a cautious attitude.

This paragraph will present, step by step, the process behind the elaboration of the LoDE(Learners of Digital Era) perspective.

4.1.1: Two big rationales for a cautious perspective

There are – at least – two main rationales to adopt a cautious perspective about the theory of a generation of digital(ised) learners.
The first rationale comes from the literature review and its internal controversy: there is a great uncertainty about current learners and new media. If we adopt the theory of a generation of digital learners, we can fall into some of the fallacies pointed out by critics; but, on the other side, if we refuse at all such theory we miss all the valuable reflection and the intuitions put in evidence by enthusiasts and concerned commentators.
The second rationale is a consequent to the theoretical framework presented in chapter 2. Aiming to develop the topic, as much as possible, in a complete and accurate manner, it seems necessary to observe the dichotomy "learners and new media" within and at the crossing of communication sciences, sociology, pedagogy, and anthropology. Keeping into account all those theoretical dimensions, it is likely to be reductive – and even a little bit illogical – to adopt just only one of the views. Indeed, a cautious perspective might solve the internal oppositions between the different views, rejecting too focused and narrowed visions of the topic.

With such a mindset, convincing explanations and intuitions are useful and welcome, such as the following one:

> Without wanting to offend many good colleagues, I dare say that game developers have understood the psychology of

> students better than many educationalists. If we could use their strategies in schools! By playing computer games, *homo zappiens* have become active processors of information, and skilled problem solvers, developing problem-solving strategies. […] technology has shaped their way of being […] *homo zappiens* consider school as a meeting place for friends rather than a learning environment. School does not challenge them sufficiently for learning and is currently at risk to get disconnected from its audience. School is one of the focal points for students' daily life, but it's not the most important one. (Veen, 2006, pp.48-49).

Veen is the inventor of the *homo zappiens* label (*idem*), which has three important merits: first, it outlines the important role of ICTs (like the remote controller) in everyday usages in terms of its impact in learning dynamics; secondly, it offers a cogent and prompt expression to synthesise a complicated concept; thirdly, it popularised the issue to professionals in the world of education. Though, this is a synthetic, general description; while educational work requests to be contextualised to be efficient, thanks to an analysis of needs and goals.

In the perspective the goal is to develop the synthesis, without reducing the analysis.

4.1.2: Building up a new label to support the suggested (new) perspective

In order to support a cautious perspective, a "not-labelling label" is necessary, namely an expression which does not have, *a priori*, the answer to the question. Such a research attitude is aimed to seek as much neutrality and objectivity as possible. Moreover, using a brand new label, the research is free of all the (both positive and negative) implications and biases involved in other expressions.

In chapter 3, an arbitrary and useful difference between the concept of "view" and "approach" was outlined. It is necessary to underline that – following that reasoning – in this dissertation "perspective" is understood as: a reading that includes all the valuable

contributions offered by the views, without being limited to them. A perspective that takes into account the lessons of the past, aims to understand the present, and prepares for the future (possibly a better one). Therefore, this perspective has the characteristics of an interpretation. While a view in considered like a pre-understanding and an approach like a strategy for comprehension.

After all the previous considerations, it has to be clarified that the label LoDE would like to express the following facets (Rapetti & Cantoni, 2010b):

- The focus is on persons, so the first word refers to them.
- The perspective is anthropological-pedagogical, so the chosen word is about learning.
- Not only young people learn though ICTs in the Knowledge Society and relevant effects on digital learners can be observed as well on adults.
- The lesson learned from "Digital natives" label is the pervasion of digital technologies in everyday life has a great impact on learning experiences but refuses to apply the "digital" adjective to people and to imply generational divides.
- The lesson learned from "generation Y" e "NetGeneration" label is the use of digital technologies (especially the portable ones) changed dramatically our way of living, it is something new in history – therefore, a new "era" –, but it does not mean it is a matter of age.
- Finally, LoDE means laude in Italian (the authors' mother tongue) and would like to express jokingly a positive (as well as critical) attitude toward the topic observed.

The aimed neutrality of LoDE perspective is also built on the theoretical framework presented in chapter 2. It has to be clarified that, denying the soundness of the expression "digital learners" and similar, the enthusiast view could seem delegitimized; but this is not the goal of the dissertation. On the contrary, without the enthusiasts we could not have the debate.

Rather, the point is to promote a wiser use of the adjective digital. A person can not be digital, even if digitally-equipped and digitally-adapted. Instead of using labels such as "digital natives", people firmly convinced of the existence of a digitalised generation of

learners should use different labels. For instance, we humbly suggest LADS – standing for Learners Adapted (to) Digital Systems. In facts, it seems that the general theory of systems (Bertalanffy, 1968) would be a useful tool safeguarding from vague analogies which have somehow marred the progress in the debate around learners and new technologies.

A final remark around LoDE is necessary to explain why – among many possible definitions of our society and our age – "digital age" was preferred.

As highlighted in the following table, both on Google and Yahoo, "digital age" is the most reported expression if compared with similar ones. It must also be pinpointed that it is not only the most used, but also it is related to a wide variety of different fields, disciplines, and contexts, from blog discussions to sociology debates, from policy advices to marketing brands.

To be noticed that "information age" occurs many times (i.e.: more than 6.000.000 times in Google); this is mainly due to the huge diffusion of the *Information Age* trilogy signed by Manuel Castells (1996, 1997, 1998) and the enormous number of quotations referring to those texts. Despite it was the most diffused expression, it was chosen to not adopt it, exactly for the same reasons expressed above. Namely, it was important not to shape implicitly this research under the umbrella of Information Age's reflections, which are significantly referred to the economical development of our society; while this dissertation has a completely different focus.

Tab. 7: records of use and diffusion of "digital era" in the net

	Google.com	Yahoo.com
"digital era"	1.230.000	3.750.000
"knowledge society"	1.020.000	2.730.000
"network society"	983.000	1.280.000

(The query has been run the 6th of June 2011)

In short, what does LoDE label imply? The goal is to offer a comprehensive perspective, in order to reduce the side effects of generalization, staying tuned with the debate.

4.2: LoDE perspective to synthesise and comprehend

The LoDE perspective synthesises and comprehends the analysis of dominant trends in the literature; in order to take advantage from all the valuable contributions mentioned in the taxonomy for the research framework.

4.2.1: Characteristics attributable to LoDE

The following flowchart clarifies how characteristics, traits, features, expectations, and assumptions attributed to the generation of digital learners can be involved in the LoDE perspective.

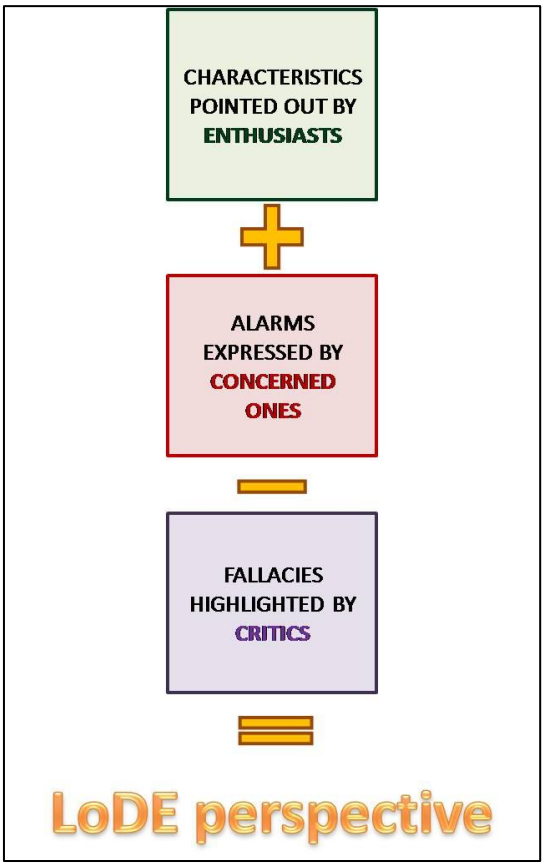


Fig. 27: from the taxonomy to the LoDE perspective

In the next sub-paragraphs, the key characteristics (and corollaries) related to learning are reported, split according to the three views presented in paragraph 3.2.3.

4.2.1.1: Characteristics pointed out by enthusiasts

What works as a turning point to describe current learners is a claimed "difference": because of the permeation of ICTs since their early childhood, they are said to have developed a different way to think (Prensky, 2001a). Proselytes of the "digital approach" are increasing, in both academia and the wider society. Professionals (can) refer to books like *Connecting to the netgeneration what higher education professionals need to know about today's students* (Junco & Mastrodicasa, 2007) – edited and endorsed by NASPA, association for the advancement, health, and sustainability of the student affairs profession – or similar texts, when they have to set eLearning or to implement digital technologies in education.

To have an idea of the level of diffusion and appreciation of this kind of books, one can take a look to online bookshops, observing how many they are, how long they are put on showcase, how much customers' reviews are enthusiastic (also those written by professionals of education).

In this book, young learners are defined – in their socio-cognitive attitudes – as:

- special,
- sheltered,
- confident,
- conventional,
- team-oriented,
- achieving,
- pressured (in this dissertation, paragraph 3.2.1.1, for description).

And considered according to the following educational characteristics (Junco & Mastrodicasa, 2007, pp.138-144):

- Driven to success: goal-oriented, they want high-rates and prefer to get the best mark instead of criticizing a teacher.
- Social: they love to interact in learning: fewer lectures and more discussions.
- Experiential learners: by learning with PCs, they developed the trial-and-error way of thinking, dislike instructional manuals and like to gather information surfing freely on the internet.
- Multitasking: because of the "development of their learning processes using such technologies, they developed cognitive processing styles that can be described as 'hypertext' in nature".

Other authors offer the following description of the Net Generation (Oblinger & Oblinger, 2005):

- They are intuitive visual communicators.
- They are better able to integrate visual spatial skills (possibly because of computer games).
- They learn better by discovery than being told.
- They can shift their attention easily from one thing to another.
- They have a fast response time and demand fast turnaround time as well.
- These differences as described become important to facilitation as they impact the learning styles of the millennials. Some of the important learning styles presented are:
- They prefer to work in teams
- They are achievement oriented and like structure as opposed ambiguity
- They like interactivity and a rapid pace. They may need to encouraged to stop and reflect
- They are more comfortable with visuals than with text

- They like to be involved in community activities and believe they can make a difference, especially using science and technology (Holt, 2009, p.2)

The points by Junco and Mastrodicasa are close to the ones articulated by Oblinger and Oblinger. It is valid to affirm that the above points constitute the core of the educational differences indicated by enthusiasts.

4.2.1.2: Alarms expressed by concerned ones

The negative effects of digital life inspired many worried voices; most relevant concerns related to learning experiences are resumed in the following list:

- No time management in using digital devices;
- Serious problem of concentration;
- Ignorance-enhancement, when processes of learning and knowledge development are mislead with information retrieval ability;
- Net-addiction, PC-addiction, mobile-addiction (etc);
- Loss of sense of reality and disconnect from the educative context;
- Brain laziness.

4.2.1.3: Fallacies highlighted by critics

The last list informing LoDE perspective presents two important aspects: the fallacies in the assumptions about a digitalized generation of learners, and the research warnings highlighted by critics:

- Do not provide a discourse which replicates the divide and the oppositions between generations;
- There is not enough scientific evidence to state a different brain functioning;
- Do not approach the topic with determinism or recipe-style;
- Do not offer worldwide generalisation, especially if moving from the observation of local or regional trends;
- Do not take for unquestionable the stereotype of tech-savvy young people, since often they use a lot ICTs but their technological skills seem to be limited;
- Do not rely in terms of scientific evidence to the main claims of the enthusiasts, when they are just speculative or anecdotal;
- Consider that skills developed in informal experiences of learning (e.g.. online social networking) do not transfer easily to formal contexts.

4.2.2: LoDE perspective: from speculative level to research

The flowchart shown in fig. 28 and the related bulleted points will be used as architecture to set the protocol for the empirical part of research. Practically, the first and the second lists work as hypotheses or open questions to be checked and the third list has to be considered like a catalogue of threats to be avoided.

The unquestionable merit of the enthusiasts view (not mentioned in the list) concerns the historical reflection about ICTs' advent in OECD countries. In this research this is assumed as the event which made possible the advent of LoDE, as the following picture shows. The importance of digital is stronger for young learners, though every person has to be considered as LoDE.

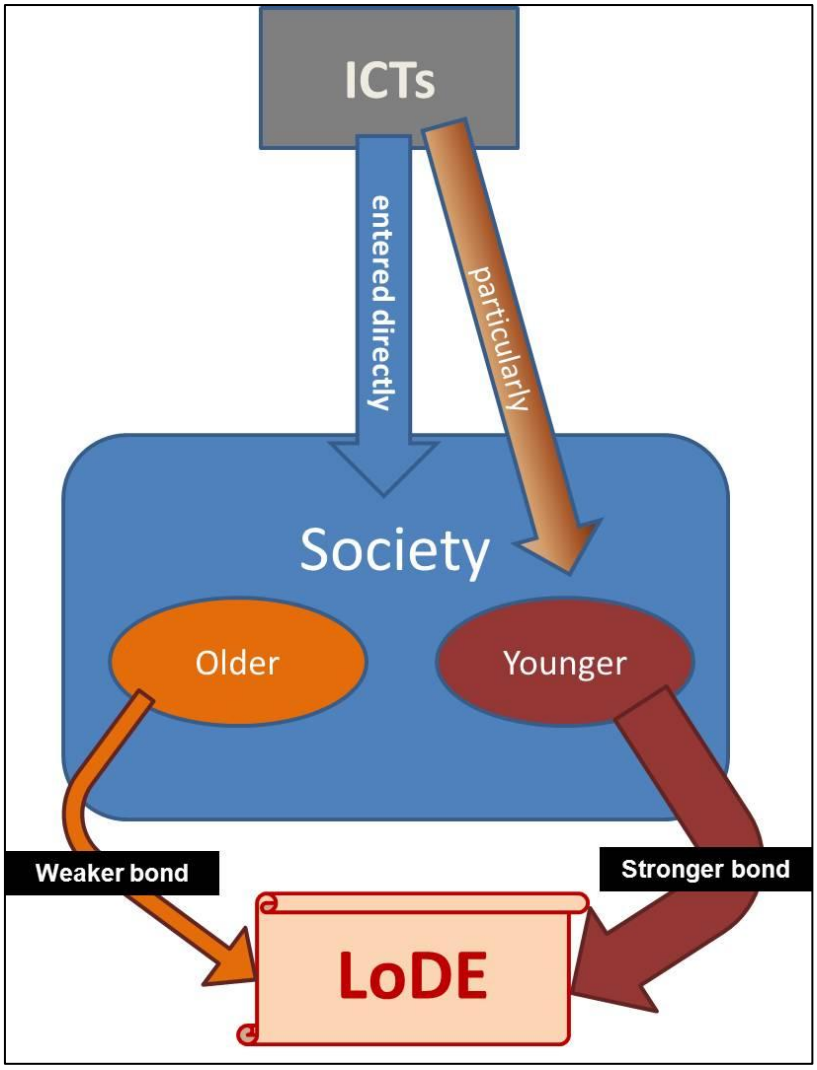


Fig. 28: advent of ICTs and effects on society

Coherently to the three approaches identified in the taxonomy, three areas are likely to be explored because of the advent of ICTs in society, beside the digital use in itself:

a. Social-relational: Thanks to technology, LoDE create or participate in new socialisation spaces, which may be totally virtual or, more often, a supplement to the ones supported by face to face interaction. Especially during adolescence these spaces are said to play an important role in the formation of the self-identity, while providing at the same time opportunities for testing it, or accommodate it, against different alternatives or vogues. Naturally, this third space of socialisation is filled

with values and attitudes that do not necessarily match those praised in the family or in the school, as educators are absent from this space

b. Cognitive: Technology is enabling LoDE to deal with information in different ways, which are bound to have a clear impact on how information is searched for, processed, questioned or critically approached, or not, shared or properly loaned, and eventually scaled up to become knowledge. Many of these daily practices by LoDE probably contradict traditional and prevalent expectations of good practice by educators.

c. Educational: The expectations of LoDE regarding teaching and learning activities, being as they intensively use information, or knowledge and communication are claimed to be contradicted by the dominant educational practices in schools and universities. LoDE would be disappointed by the scarce use made of available digital technologies in education, and the severe limitations imposed by teaching and learning methods where they are expected to be passive and conforming consumers of orally or printed information delivered by teachers, with little space for exchange among pupils. As a consequence, LoDE would become increasingly disaffected from schools and less and less interested in conforming to the pre-established pattern of the good pupil.

In other words, four dimensions offer together a complete understanding and interpretation of LoDE. Different (or specific) characteristics and behaviours are expected from learners...

1. ... technically,
2. ... in cognitive skills,
3. ... in the social arena,
4. ... in learning experiences.

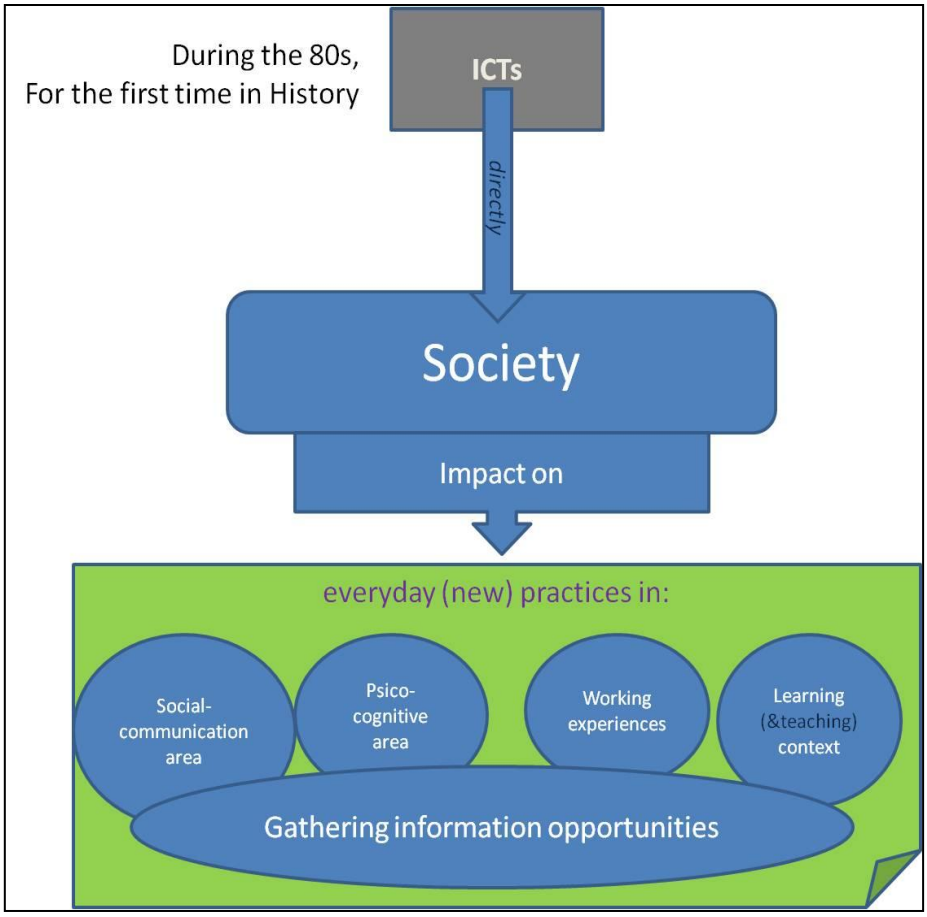


Fig. 29: synthetic model about the impact of ICTs on society
(Source: OECD-CERI, 2012 - forthcoming)

Being structurally different, the four dimensions originate four different types of measurable effects; each one of them needs to be studied individually, according to the following schema.

Tab. 8: dimensions and measurable effects of expectations on LODE

Dimension of expectations on LoDE		**Measurable effects**
1	Technically	measurement of ICTs access, usages and familiarity
2	In cognitive skills	record of new cognitive skills related to ICTs
3	In the social arena	observation of different social behaviours related to ICTs
4	In learning experiences	investigation of competence(s) transfer from leisure activities (informal learning) to education performances (formal learning)

Combining the above table with the lists composing the LoDE perspective offers the rough architecture of the empirical part of the dissertation, which will be described in details in chapters 6 – about the methodology – and 7 – showing results. Some of the effects have been addressed with quantitative methods, some others with qualitative research and, for many of them, a combination of both approaches was considered more effective. It has to be stated that the second dimension is not explored in this work.

Chapter 5: Preliminary case studies

This chapter is devoted to sum up the results of two researches conducted by the author of this dissertation, because they are close to the topic of this dissertation; data relevant for this text are briefly presented.

The first paragraph explains how the dichotomy learners and new media was considered urgent and very important within the NewMinE Lab, to the point of inspiring a research project named eEthnography. One of the main goals was to address the key-question: does age matter, if you are a learner in the digital era? And, if yes, concerning the attitude towards ICTs and eLearning in learning experiences, how does it differ if comparing different contexts? The name of the team project sprout out from the belief that crossing quantitative and qualitative – even ethnographic – methods to address such a complex issue was necessary. University and workplaces, and university in developed/developing countries were the main contexts of analysis.

"Gen Y @ work" – presented in paragraph 5.2 – was run with the purpose of studying the use of the ICTs by young employees of GenY (namely, people born after 1980) in Canton Ticino (Switzerland).

In paragraph 5.3 is presented "LV@ UWIOC", a research project developed at the University of the West Indies. The rationale inspiring it was to explore eLearning perceptions and ICTs' usages in a context where they represent the only chance to achieve higher degrees.

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- Rapetti, E. & Cantoni, L. (2010a). "Digital natives" and learning with the ICTs. the "GenY@ work" research in Ticino, Switzerland. *Je-LKs, Journal of eLearning and Knowledge Society-English Version, 6* (1), pp.39-49. Retrieved from: http://je-lks.maieutiche.economia.unitn.it/index.php/Je-LKS_EN/article/viewFile/386/373.
- Rapetti, E. & Marshall, S. (2010). Getting over the "generation Y" perspective: Observing ICTs in learners' experiences around the world. *QWERTY Journal of Technology, Culture, and Education, 5* (2 - Special Issue on "Generation Y, Digital Learners and Other Dangerous Things"), pp.58-85.

5.1: eEthnography: more than a unique PhD project, a research team

The need to analyze broader and in deep learners and new media emerged because of the growing importance of the theme (and the debate around it), crossing "hot" fields, such as: ICTs adoption, informal learning, *glocal* instances in instructional design, media diet, and media education.

To do this, the eEthnography research path emerged at NewMinELab, with the goal to explore the so-called media diet of learners (namely: when, why, how and how long an ICT is used in learning), combining quantitative methods with qualitative ones (till the exploitation of ethnographic methods, like: non-structured interviews, serious gaming, diaries, pictures, etc).

To address such issues, the existence of an "eEthnography team" came along, under the supervision of prof. Cantoni. The team involved professors, post-docs, many PhD students, and a number of students.

It must be underlined that the whole research work has been meant to understand learning in depth, contextualizing it and avoiding generalizations (e.g.: if the learners are digital, they must be taught digitally); this step is considered strategic to inspire instructional designers and to offer useful guidelines for an eDidactic. On the NewMinE Lab website there is a dedicated page to eEthnography: www.newmine.org/projects/completed-projects/e-ethnography.

The project has been carried out following two main directions, in order to approach the theme from parallel points of view and observing different contexts:

- *Learners' voices at Universities*, whose main goal is to study the relationship between learning, didactic, eLearning and eDidactic, observing ICTs' use and appropriation by students; within this, four research projects were implemented:
    - *Learners' Voices @ USI* (pilot phase), run at Università della Svizzera italiana (Faculty of Communication Sciences) with the main aim to test a customized version of the questionnaire from the research project promoted by the JISC consortium (JISC, 2009);

- *Learners' Voices @ POLIMI*, run at Polytechnic of Milan – Como Campus; in this case students were asked to create videos representing the impact of ICTs in their everyday learning experiences;
- *Learners' Voices @ UWIOC*, run at the University of the West Indies – Open Campus with the goal to draw – using a questionnaire – a general picture of ICTs importance in everyday life of students of an online university (in a context in which eLearning is not a choice, but the only way to access higher education), and to analyse in depth the learning strategies, ICTs and eLearning perceptions, and which approval and consensus learners express about the idea of the existence of a "digitalized generation of learners" – through non-structured interviews;
- *Learners' Voices @ USI-SUPSI*, run at Università della Svizzera italiana and Scuola Universitaria della Svizzera italiana. The quantitative part was done thanks to an online questionnaire sent to the whole population of students, while the qualitative part was turning around a self-projective method using LEGO bricks.

- *Gen Y at work*, aiming to answer the question if "digital natives" think and learn (to work) in a peculiar way, and how the media environment in which they grew up impacted their learning culture and their feeling about the connection between private and professional life.

Concerning the PhD dissertation, the abovementioned corpus of analysis is considered as informing background material. In the chapter, we will enter in details of "GenY@work" and "LV@UWIOC"

5.2: "Generation Y at work"

5.2.1: Introducing the research project

Being learners in the digital era, as highlighted in chapter 4, is related both to formal and informal aspects of education; as well as ICTs are enhancing didactical strategies both in schools/universities and vocational training.

Because of that, the "Generation Y at work" (Gen Y at work) research project was conducted in Canton Ticino (Switzerland), whose purpose was to study the use of the ICTs (Information and Communication Technologies) by the young employees of GenY (namely, people born average after 1980, according to Howe and Strauss categorization).

This research enabled both to better understand the population studied and to observe how some of the assumptions about GenY and digital natives are nothing more than the result of huge generalizations.

5.2.1.1: Research protocol

The research design was guided by two goals:

- Discovering whether a cross-skills "technological potential" between private life and professional world does really exist and, in case, observing how it is exploited;
- Investigating how people really use the ICTs, considering them as actors in the learning action.

The study wanted to offer a representation of the Gen Y employees' technological skills to the HR responsible of the companies involved. In this way, they would have been able to organize a training design which could better fit with their employees' educational and cognitive needs.

The design prefigured a quantitative and a qualitative (almost ethnographical) phase. The method was appositely developed using LEGO bricks. The project involved six companies based in Ticino: three banks, a consultancy society operating in the bank field, a newspaper publishing house and an industrial gas turbine society.

The quantitative research phase was participated by 234 persons belonging to the Gen Y range (i.e. born after 1980). Among them, 109 were women (46%) and 127 were men (53%); their age medium was approximately 23 years old. 35 people participated to the qualitative phase.

A survey was elaborated in order to investigate:

- the ICTs owned;
- the usage of the ICTs by the participants;
- the participant's own image of ICTs;
- the role of the ICTs in learning experiences;
- a comparison between the use of the ICTs at home and at work.

The "almost ethnographical" phase was appositely conceived in order to find out whether a "technological potential" does exist and how it is exploited between the private and the working sphere. The key concepts have been: being an author/actor in a system (Crozier & Friedberg, 2004), and the metaphorical game (Gauntlett, 2007).

The method was developed to exploit the efficacy of playing to better understand the relationship between "learning culture" and "learner's attitude"; this relation is meant to be a mutual influence between the subject and the myths, the rites and the organizational models (Cantoni, Botturi, Succi *et al.*, 2007, pp.45-46).

5.2.2: Relevant results for this thesis

The study confirmed assumptions about the great usages of ICTs by participants; both to perform their working tasks and – and most of all – to communicate and for leisure. But the need of digital experiences in the learning process was not really remarked: new technologies are perceived mainly as a useful help, and not as a binding step.

5.2.2.1: ICTs and learning

The demand of digital learning appears more as a contextual opportunity ("if you can use a projector during class, why not doing so?" said a participant) than a learning need; furthermore, the qualitative phase cleared that ICTs are appreciated in the training experience only when they are supported by "traditional" instruments such as lessons in presence, interpersonal interviews, books, folders of photocopies, notes etc.

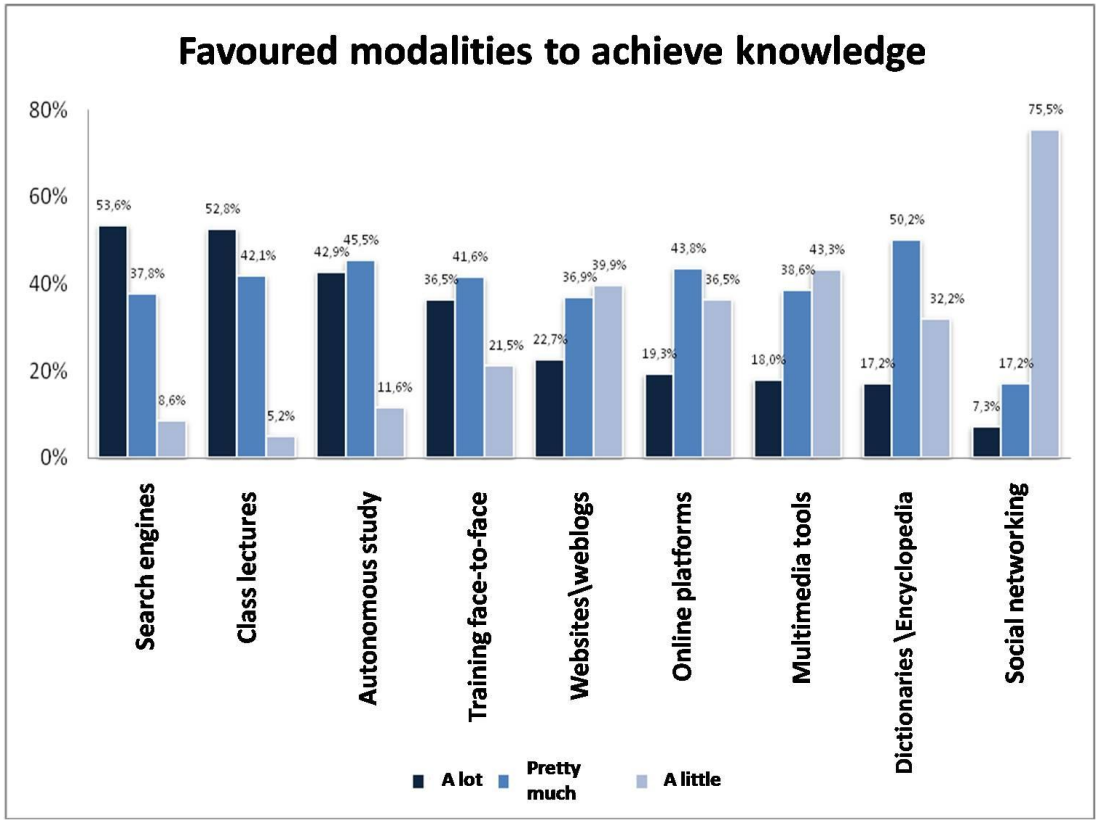


Fig. 30:favoured modalities to achieve knowledge (%)

The GenY employees perceived themselves as different in the manner they master new technologies in learning, if compared to their older colleagues, which seems to confirm the digital divide phenomenon (or at least a prejudice of it). A deeper analysis of the responses, however, reveals what claimed by the most critical voices about the concept of digital natives: what can be said with certainty about digital natives is that their media competence "Solely consists of being able in locating information"(Schulmeister, 2008);

and, actually, the only case in which a significant majority believes that there is a generational gap is the answer “to seek information and knowledge.”

5.2.2.1: The most common ICTs do not reveal a generational difference

The first characteristic of digital natives students and workers is that – if we exclude iPods and MP3 players – they use the same ICTs of their parents or teachers. Furthermore, more recent tools (e.g. Netbooks and handhelds) are still rare.

What impresses is that the better mastered ICTs are substantially the ones already widespread in the late 90s. This becomes even more interesting if considering what are the most used applications: software packages for office, then (but only just over one third of the population) image, audio and video editors. Only at the end of the list it is possible to find the utilities developed more recently, and in some cases with very low percentages (e.g. 8,5% for mind mapping).

5.2.2.3: The technological potential does not overcome the wall private/professional life

One hypothesis we wanted to verify, within the research goals, was whether digital natives bear a peculiar potential related to the usage of ICTs, which implies a specific attitude in the relations with new technologies, and whether this potential has a – direct or indirect – connection with learning. Since in literature there is not unanimous agreement if this characteristic is attributable to the sphere of knowledge, of skills and/or of capabilities/abilities, researchers strategically decided to simply call it “technological potential”, and to indicate with it a recognizable ICTs-oriented behaviour in daily activities.

According to the results it is accurate to affirm that the “technological potential” does exist, if with it we refer to a stronger fondness and habit (even induced by contextual conditions) in using new technologies in order to carry out actions and tasks related to communication, sharing and development of content. It is also a fact that many skills, which nowadays are considered as essential and ordinary are assets of digital experiences (like sending an SMS), both professional and private, and it is clear that for

those who have handled ICTs since early childhood the use of technologies is easier, if compared to digital immigrants. It should also be recognized that many skills that are related to the "digital" cross the boundaries between the whole life experiences (from handling a videogame controller to using a scanner barcode) and it is logic that what is learned in private life is part of cultural and behavioural heritage on the workplace.

But a very interesting point highlighted by the research concerns the weak transferability of skills and knowledge between these two spheres (private life and workplace): the transition is not usual. On the contrary, it appears that at the workplace ICTs are perceived as professional tools, which require formal and institutionalized learnings; creative usages of the technological potential are rare and there is no free expression for the trial-and-error learning style; the free sharing of knowledge through the "Web 2.0" is not realized, even if it appears to be desirable. While, at home, ICTs are conceived as objects of entertainment, and approached through self-learning. That is: what is particularly problematic is not the transposition itself of a skill/ability/capability, but the way of acquiring it. This was highlighted by the statement of one participant: "I can learn how to play Wii however I want, but I cannot do the same with a bank application!" A possible interpretation of these results is that the "technological potential" is the result of pervasive and continuous experience with ICTs, but this does not affect how the digital natives prefer to learn, when they are involved in formal or institutional learnings.

If the differences between the use of ICTs at work and at home are really few in the cases of "to search information" (in both contexts are used "a lot" by 54,5% of respondents) and "to communicate", there is a small prevalence of their use at work when they are needed "to learn" (people use them "a lot" and "pretty much" in the 82, 9% of cases at work and in the 73,8% at home).

Though, the most interesting results came from the qualitative part of research. In all the LEGO sessions held with the companies involved in the study, the amount of technology chosen as important in the learning experiences of the participants is far greater when concerning the private life than when concerning the professional practice. In total, there

were 96 technologies selected and presented by LEGO artefacts, among them: 49 were placed in the “private life” part of the common landscape, only 14 in the “workplace” part and 36 straddling both parts.

The talks with the participants explained this imbalance in terms of a different representation of the role of ICTs in their experiences: at work, ICTs are professional objects, while in private life ICTs are media for leisure, so they are perceived with a sense of greater freedom of use.

To conclude this point, it is important to note that the technologies which have often both private and professional functions are portable devices (cell phone, handheld, laptop …); they allow customisation – even if offered by the company – which makes them the tools to rely on when developing a new teaching, in order to exploit the “technological potential”.

5.2.3: Concluding remarks about GenY@work

This study unveiled a complex reality, where a sort of “technological potential” or “media skill”(Schulmeister, 2008)has been confirmed indeed, but to a less great extent than acclaimed by some researchers describing the “digital generation”. It seems that “attitude” (rather than “skill” or “potential”) would be more correct to define a sort of broader disposition (if compared to the one of older colleagues) to relate to other people and to knowledge through ICTs. Predictably, indeed, it came into light that young people hang out daily with technologies, both to perform their working tasks and – and most of all – to communicate and for leisure.

Furthermore, the success and spread of the expression “digital natives” itself deserves to be studied, to figure out the reasons for such a broader, but only partially justified, success.

All in all, GenY@work is pivotal for the present dissertation for – at least – three reasons:

- it highlights that learners in the digital era are not only young people, indeed the relevance of ICTs in learning experiences has necessarily to be explored taking into account work and leisure contexts;
- it made possible to invent, test, and customise the ethnographic method of LEGO© session (which will be presented in details in chapter 6);
- it offered the possibility to check whether a “media skill” or a “technological potential” is observable in learners digitally-adapted.

Remarkably, this research project is quoted in other articles (such as: Comba, 2010; Cantoni, 2011; Casagranda, *et al.*, 2011; De Ascaniis, *et al.*, 2011; formationprofessionelle.fr, 2011).

5.3: Learners’ voices at the Universities of the West Indies-Open Campus

5.2.1: Introducing the research project

Within the eEthnography research team, after abovementioned data, the need to change environment of analysis developed. Because of the role of ICTs in educational experiences it is difficult to sharp in learning contexts where there are no problems of accessibility and where – very often – digital technologies in education are just perceived as a mere "added value".

The question arose: what about if eLearning is the only chance? The goal to check the digital attitude of digital learners in contexts where ICTs are more than an added value is the rationale for the “learners’ voices at the Universities of the West Indies-Open Campus” project (in short, LV@UWIOC).

“Getting over the “generation Y” perspective: observing ICTs in learners’ experiences around the world – The UWIOC case” was the name of the research project developed at the Universities of the West Indies-UWI (main locations: Barbados, Trinidad and Tobago, Jamaica), with the goal to observe the learners’ experiences and perceptions of ICTs usages and eLearning within the reality of UWIOC-Open campus of the Universities of the West Indies.

UWIOC was chosen to observe these dynamics because it provides online courses for the 16 English-speaking nations of the Caribbean, and for some of them (e.g., Anguilla) it is the only available access to university education. Therefore, in the researchers' intentions it was considered strategic to understand what kind of role the "generational factor" plays in exploiting ICTs when eLearning is not a possible added tool to learning but is the only way to reach educational success.

The research project "Learners' voices @UWIOC" presented below was meant to take into account all the abovementioned issues, and one of the main purposes was to overcome the "generation Y" perspective and its related labelling-system because of its main weaknesses. Indeed, the authors' perspective aims to observe learners in their context and to understand how they consider ICTs and perceive eLearning in their learning experiences; besides, the research protocol was designed to check if learners represent themselves according to the characteristics drawn by Howe and Strauss and if they feel that they are 'digital.'

The UWIOC condition was considered strategic for the research itself because of the unique and perhaps unusual reality in which 16 island-countries are served by one open campus (which, in 12 cases, is the only chance to access a university-level education).This generated a context in which the eLearning way to teach and learn is really and structurally needed and it is not vaguely provided only because "digital natives must be trained digitally".

5.2.1.1: Research protocol

The research design was planned to combine qualitative and quantitative methods, following the criteria to get a complex picture of the reality observed. Therefore, the research project was conceived in two phases of retrieving data:

- Phase 1 (quantitative): planned in order to have a deeper knowledge of the reality about ICTs use in Caribbean learners' experiences. This objective was pursued through an online questionnaire and statistically treated.

- Phase 2 (qualitative): conceived to discern the reason of ICTs use in learning and to figure out what are the real usages of new technologies in digital natives' lives. To get this aim, semi-structured interviews (Bailey, 1991) were performed with UWIOC students (both blended and fully online ones).

5.2.1.2: Data about participants

In order to respect such a complexity, the protocol implied both quantitative and qualitative.

Concerning the quantitative part, the online questionnaire was sent by mail to all the UWIOC students enrolled in higher education level. Main items of the questionnaire were:

1. Personal data (age, sex, economic income, country, university enrolment, etc).
2. Owned digital technologies.
3. Access to the internet.
4. Most used applications and digital technologies.
5. Online activities.
6. Most used social networking / social sharing applications.
7. Use of ICTs at home and at work and practices of study with ICTs.
8. Perception of a generational gap in the use of ICTs.
9. Favoured tools to learn in the Knowledge Society.
10. eLearning perception.
11. Self perception in using ICTs.
12. Free comments.

Despite three subsequent recap actions, the expected sampling of 200 learners (stratified in 100 blended and 100 fully online) was not achieved. Researchers were forced to work with a self-selected sample and to analyse quantitative results as a whole concerning "country", "university enrolment", and "campus" variables (while the objective was to observe the sample through all the demographical variables).

The final number of respondents was 128 and their representativeness of the population was respected except for the country variable (overbalanced the presence of Trinidadians, and 3 countries not represented). Observing age distribution, “GenY” (born after 1980) respondents were 36,7% (indicated in charts below as “younger”). The gender repartition was: 81,3 female and 18,6 male.

Concerning the qualitative part, it was planned to meet students expressing the most demographic variance possible (respecting the population distribution), in order to have a qualitative data set not precluding the possibility to extend results to the whole population. The interviews’ protocol was semi-structured and covered the following areas:

1. Personal data (name, age, sex, nationality, campus, worker/non-worker, blended/fully online, university enrolment, etc).
2. Explaining what does it mean to use ICTs (in learning experiences).
3. Describing the most used/favourite ICT and why.
4. Reflecting about the most useful ICT in a learning experience.
5. Talking about generational differences in using ICTs to learn.
6. (After a brief presentation of the digital natives/immigrants) discussing Prensky’s theory.
7. Checking the Howe and Strauss distinguishing traits and expressing agreement/disagreement.

Learners were met on two of the three campuses giving both physical and online university lessons (namely, in Barbados and Jamaica) and in one of the twelve countries were UWIOC only holds learning centres (St Lucia). Considering the contextual constraints, mainly due to the worker/employee condition of a large number of students, the final sample was solid and satisfying; over 15 persons were interviewed, 8 were younger than 30 years old (“GenY” members) and 7 were older; 9 of them were female and 6 male; 6 came from Jamaica, 5 from Barbados, and 4 from St Lucia; 8 were attending fully online programmes and 7 blended ones; 10 described themselves as workers, 5 did not

5.2.2: Relevant results for this thesis

5.2.2.1: Results from quantitative data

In a panorama of results, it is possible to conclude that the age factor has a discrete impact on certain aspects (e.g., the familiarity with new digital devices), but cannot be considered as the independent variable explaining how current learners face ICTs. What the results outline is the ability of UWIOC learners to set their media environment in the most efficient way, involving digital technologies when needed – above all in the communication area. If there is a significant difference between "gen Y" and those older, we can see it in the time devoted to use ICTs (the frequency of usages), and this influences the familiarity with new devices; but the expressed goals are on average the same, without any generational break.

Interesting results emerge from the question about which is the preferred way to learn. Respondents were asked to choose among all the available learning strategies in their experiences, considering the ones made possible through ICTs (like using search engines or Wikipedia) and the "classical" ones (like lecture in classroom or printed dictionaries).In the questionnaire it was clarified that "to learn" was meant in the broader sense of achieving any kind of knowledge useful in learning.

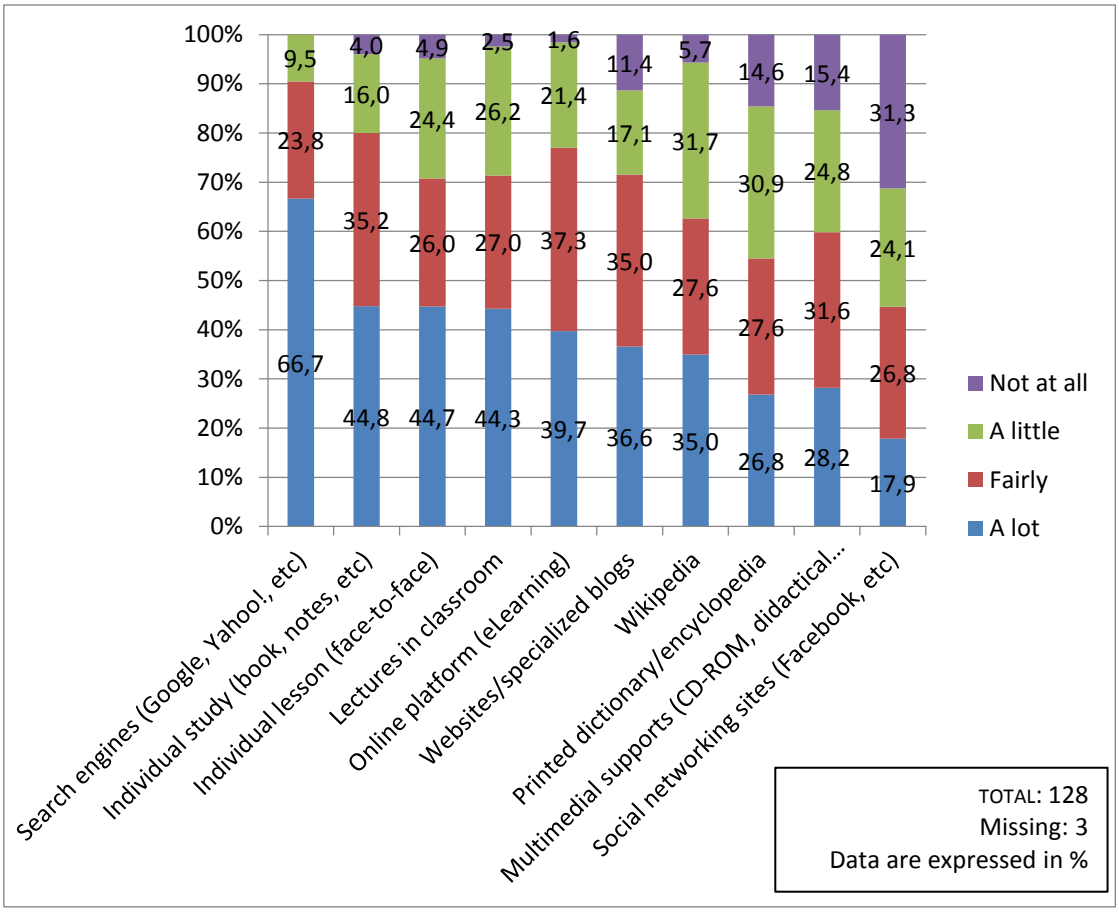


Fig. 31: the preferred ways to learn

As revealed by fig.31"search engines" was the most chosen option (two thirds of respondents said they prefer them "a lot"); but it should be emphasized that the second, third, and fourth options were those pertaining to "classic" learning strategies, and only in the fifth place do we find eLearning.

The following chart shows the distribution of younger and older concerning the answer "a lot" for "search engines" and "individual study" cases (the first two), and "eLearning" (pointed out for its relevance in this PhD); what emerges is a more cautious attitude of young people, who - in the eLearning case - reach 10 percentage points of difference.

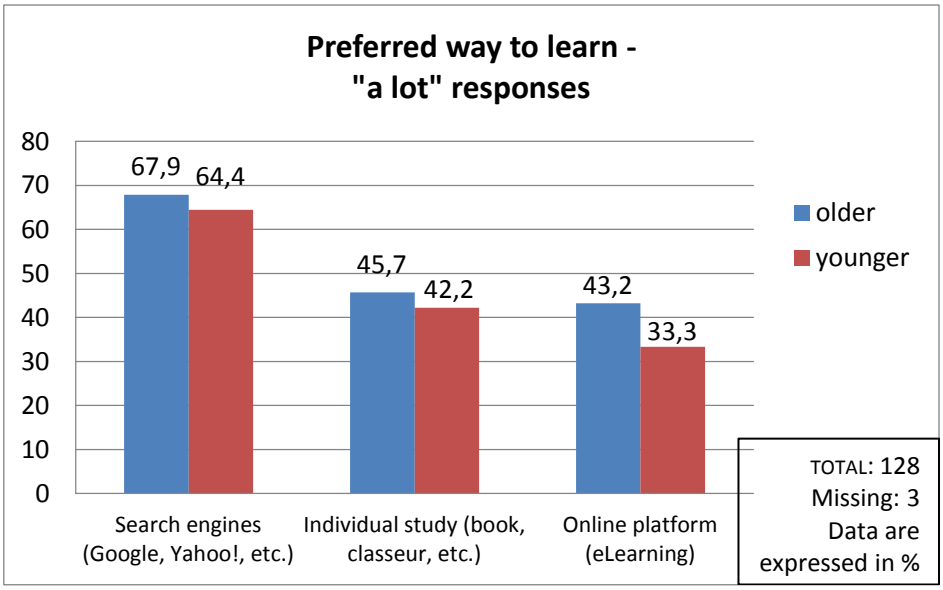


Fig. 32: the preferred ways to learn, generational split - focus on "a lot" responses in three prominent cases

Another very interesting descriptive statistic regards the eLearning perception declared by respondents; in the questionnaire 21 learners were asked whether they agreed or disagreed with a list of statements. General results about this question show that 87,2% of the sample agrees that "eLearning is an important element of my courses". Examining generational differences reveals a more cautious behaviour of the younger group.

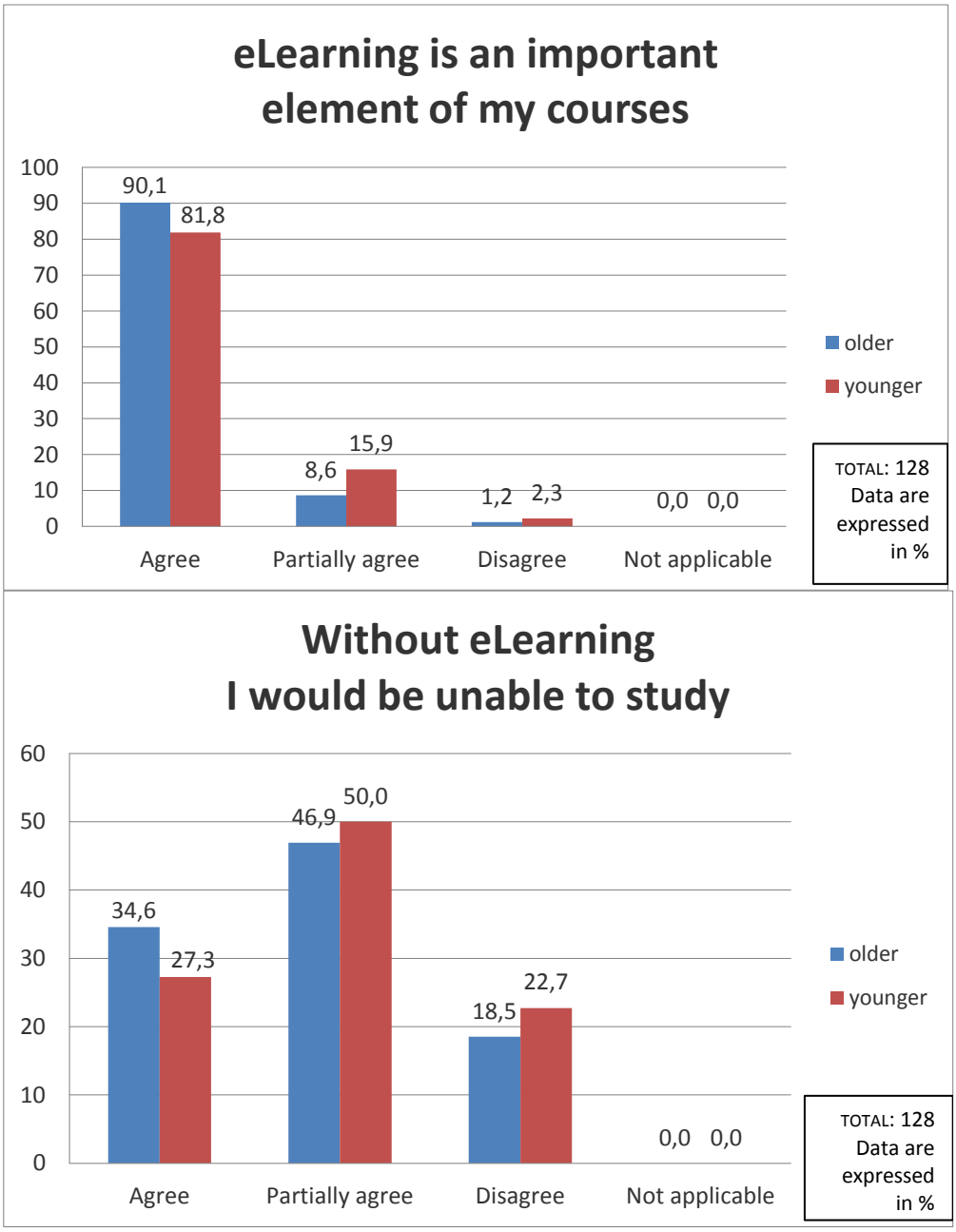


Fig. 33: eLearning perceptions
"eLearning is an important element of my courses" (question 21a)
and "without eLearning I would be unable to study" (question 21b)

Not only young people do not show a marked preference, but even the older group seems more related to technology in education.

5.2.2.2: Results from qualitative data

A general overview coming from interviews portrays competent learners, on average appreciating ICTs in every aspect of everyday life and exploiting the chances offered by digital devices, not excluding the educational field. At the same time it emerges that there is not the age variable to cluster the "tech-addicted" ones: the most excited about videogames was a woman 37 years old who stated that "ICTs broadened my mind" (N.J., St Lucian, teacher in primary school).Two other interesting hints concern more universal aspects: by everyone digital technologies are said to be essential above all for communication goals; most of interviewees contributed to discussion emphasizing the big changes ICTs produce every day on human life; as predictably this kind of comment covers the whole range from utopia – "you can access all the infos, immediately...from all over the world. No more difference in knowledge!" (A. M., female, 50, Barbadian, housewife) – to dystopia – "Internet allows you to do everything, example, I copy from Google the Excel templates and it enhances my professionalism...but, trust me, I'm poorer: I'm not able anymore to do calculations by myself. Much less a chart" (A.Q., male, 46, St Lucian, government officer).

Prensky's concepts of digital native/immigrant were discussed in all the interviews, after a brief explanation of the discourse about this kind of approach. The possibility to be conceived as "digital" split the sample: 8 of them were charmed by the idea, while the others found it not appropriate to describe human beings; it is to be noticed that the age variable was transversal throughout the two groups and that only one interviewee agreed with the hypothesis of different brains. Some quotations help in understanding how learners feel themselves: "Yeah, everything around is tech-based. The world is digital, so I'm digital" (F.A., male, 21); "Very much so! A lot of technologies in my life: from my Blackberry, to my micro-wave, everyday" (S.S., female, 21); "Human beings are digital because everything is about [the] computer! The brain itself is a computer" (A.R., female, 22); "...natives born within an environment, immigrants have to come in [...]. But this is not a problem: world goes digitally? And we don't have to rest behind!" (S.M., male, 44); "No, I'm opened to learn. Tech-ability is related to the person, not to

age" (N.J., female, 35); "This is the classical American perspective: they simplify! To split in two groups is a stereotype, but persons are meant to be adaptable to change" (D.B., male, 47); "I see the point, but I really don't feel at ease with the word 'immigrant'!" (P.S., female, 51); and the corrosive "Uhm! So, is my father 'analog'?" (K.H., male, 21).

In 14 cases out of 15 interviews, one open question focused on the "generational divide" issue: all of them agreed about the existence of a difference and 3 persons asserted that there is "definitely" a gap (one lady said the "younger make you feel like a baby when they're at the computer"). The rationales provided for this difference are very interesting for researchers: time management problems (proposed 6 times), lack of digital literacy (4 times), more mind agility in learning when children (4 times), cultural factor of being born in a digital environment (2 times). According to F.A. (male, 21, Barbadian, student), it is related to different lifestyles: "Yeah, age matters! Young brain[s] are able to pick up easily new technologies [...] it is something in the way we think related to the life pressure. It's for…different level of stress and time: we don't have to worry about family and work. So, young people are more advanced in new stuffs" (sic); and D.B. (male, 47, Barbadian, supervisor of an electricity company) declared "...they spend more time on pc: my son's computer is on all the time, for any kind of things. The whole social/human being is upset by computer...while, as [for] me, when I come back at home it's night: I turn it on just to study and stop"; while A.R. (female, 22, Jamaican, employee) put the attention on learning: "adults are slow. If one lady is not familiar with pc, in the classroom, when I'm already working she's still turning on it. The time and the effort are different: learning how to do is time consuming and they prefer to call and ask help instead of learn how to do".

5.2.3: Concluding remarks about LV@UWIOC

In summary, the global outcomes of "Learners' voices@ UWIOC" state that not only do the quantitative data not reveal the expected enthusiastic appreciation, but they also show that people in the Gen Y bracket (which is forced to use eLearning and ICTs for contextual reasons) are much more cautious in positively assessing digitalized learning

than their older university-counterparts. Moreover, qualitative data outlines about several facets to the generational gap facing the digital world which should be investigated in further research.

LV@UWIOC is a strong basis for LV@USI-SUPSI, since it represents a valid and interesting scenario of comparison. Besides, in the development of this PhD, LV@UWIOC has been fundamental to overcome simplistic views around learners in digital era, mainly based on generalizations.

PART II:

A RESEARCH PROJECT INFORMED BY LODE PERSPECTIVE

Chapter6: "The Learners' Voices at USI-SUPSI" research project

Nine paragraphs composing this chapter are completely devoted to present the methodological development of LV@USI-SUPSI.

The background research is the JISC programme, which operated in UK with the aim of listening to the learners' point of view in order to understand their actual usages of digital technologies. Using this information, the objective of the program was to define the pedagogy needed to support eLearning practices. This represents the starting point for the LV@USI-SUPSI research project and it is summarised in paragraph 6.1. Moreover, the online survey elaborated by JISC's researchers was the basis for the final online questionnaire used in the research described here.

The second paragraph reports the pilot phase of LV@USI-SUPSI, conducted within the faculty of Communication Sciences; during this step, the methodological tools were customized, refined, and validated for the Ticino context.

In 6.3,it is explained how the LoDE perspective inspires the research structure.

Paragraph 6.4 shows the research architecture. A combination of hypotheses – to be statistically checked – and open questions– to be qualitatively addressed – represents the research strategy.

In paragraph 6.5, two key aspects of the methodological plan are discussed, namely the sampling, and the strategy to combine quantitative and qualitative approaches.

The sixth paragraph explores in depth the previous ones, reporting specifically how the research questions were split between the quantitative and the qualitative part of the analysis. The research plan was set to merge data coming from an online questionnaire, from media diet diaries and LEGO sessions.

In 6.7, an overview of the qualitative dataset, given its peculiarities, is presented.

Paragraph 6.8 is meant to discuss all the potential biases that are emerged during the development of LV@USI-SUPSI.

In the paragraph 6.9, the chapter sums up the methodological choices, offering a synthetic scheme.

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- Cantoni, L., Rapetti, E., & Tardini, S. (2010). Generation Y and "glocal" working. In B. Bertagni, M. La Rosa & F. Salvetti (Eds.), *"Glocal" working. living and working across the world with cultural intelligence* (pp.252-272). Milano: FrancoAngeli.
- Rapetti, E., Butti, M., Misic, S., Botturi, L. & Cantoni, L., (2009). Realizing the technological potential of young employees with LEGO bricks. *Ethnographic Praxis in Industry Conference Proceedings - August 30 – September 2, 2009* (pp.343-347). Chicago, IL-USA.

6.1: The research background: the JISC programme

In this paragraph many pieces of texts are excerpts from the official JISC documents and papers showing their results.

If the debate concerning the dichotomy learners and new media was the trigger for the research, the methodological inspiration came from the JISC research "Learners' voice".

In UK, a consortium of universities and research centres is working under the umbrella of the Joint Information System Committee (JISC) programme, which aims to provide empirically grounded evidence of students' actual use of technologies. It is a large research project which has been active since 1993 (http://www.jisc.ac.uk/aboutus/history.aspx). JISC "inspires UK colleges and universities in the innovative use of digital technologies, helping to maintain the UK's position as a global leader in education" (www.jisc.ac.uk/aboutus/whoweare.aspx).

The consortium offers a huge amount of data; here, just a sample of their research will be presented. It is, firstly, important to remark that

> A previous detailed review showed that the learner perspective on eLearning had been largely overlooked [...] but that knowledge of how learners use and experience eLearning/technology in their learning activities was crucial for the development of tools, pedagogy and teaching practices (Conole, *et al*., 2008, p.511).

The JISC programme was the most important inspiration for this dissertation, both for the methodological architecture and for the research attitude; indeed LV@USI-SUPSI was establishedfrom the idea to listen to the learners' perspectiveand develop pedagogical advices and a sound framework.

6.1.1: Methodological architecture of JISC's "Learner's Voices"

LEX (Learner EXperience of learning) and LXP (Learners' eXperiences of blended learning environments in a Practice-based context)are the two projects (JISC,

2007)whose data are most relevant for this dissertation, among the significant number of investigations and analyses proposed by JISC.

Particularly, the research methodology built for those two researches is interesting.

> The main research questions addressed were:
> • How do learners engage with and experience eLearning?
> • What is their perception of eLearning?
> • What do e-learners do when they are learning with technology?
> • What strategies do e-learners use and what is effective?
> • How does eLearning relate to and contribute to the whole learning experience?
> • How do learners manage to fit eLearning around their traditional learning activities? (Conole, *et al*.,2008, p.512).

Participants were UK higher education learners belonging to the following departments: Medicine, Dentistry and Veterinary Medicine; Economics; Information and Computer Sciences; Languages, Linguistics and Area Studies(JISC, 2005).

> Data collection consisted of three main sources: an online survey, audio logs and interviews. The online survey was used to gain a wider contextual understanding of learners' experiences, whereas the case studies of individual learners (via the audio logs and interviews) described the nature of the eLearning activities carried out by the learner. The combination of methods allowed for rich empirical data, as well as for the triangulation of interpretations of the data. [...] The survey covered a broad spectrum of technologies and contained a series of matrices of technologies against types of learning activities. These matrices drew on the media types table originally developed by Laurillard (2002) and the definition of learning activities developed in the DialogPlus taxonomy (Conole and Fill, 2005) of learning activities as a basis

> for categorising types of technology and their use (Conole, et al., 2008, p.512).

The survey used by JISC (eLearning Research Centre, 2006) was taken as a starting point for the pilot phase of LV@USI-SUPSI.

6.1.2: Main results and relevant advices

It is clarified that there are five areas in which ICTs are more significant in learners' experiences.

> [Indeed,...] although there was a degree of commonality in terms of the general hardware and software used [...by subjects], how they were used and the frequency of use, differed. Students reported using technology primarily for:
> • researching and retrieving information
> • communicating with fellow students, friends and academic staff
> • processing and manipulating data
> • saving, storing and sorting information and data
> • preparing assignments and presentations (Conole, et al., 2008, p.514)

In JISC official reports the above points are described in detail, here it is sufficient to report that researchers pointed the following "factors influencing technology use" (*idem*, pp.519-521): environment, usability, accessibility, personalisation, discipline demands, learning strategies, support and communities, institutional infrastructure.

Because of that, a shift in the way in which students are working is expected. The following eight key-statements express the complex interaction and relationship between learners and ICTs, in terms of what is changing in the learning practice:

1. ICTs are getting pervasive and integrated in students' life;
2. Students adopt technologies in order to meet their own needs;
3. There is a broader social arena where learners play, thanks to ICTs;

4. Learning contents are no longer ‘fixed’ and ‘valued’, student use them as a starting point, something to interact with, to cut and paste, to adapt and remix;
5. New forms of skills are emerging, related to the management of hybrid forms of information drawn from a multitude of traditional (text books), existing (Google search engines) and emerging (blogs, Wikipedia) sources;
6. Computers are the central learning tools. And “there is evidence of the transfer of practices of their use of technologies in other aspects of their lives to their learning context”;
7. The concept of ‘time’ is changing – both in terms of expectation of information and results on demand;
8. Students’ working patterns are changing, especially for what concerns the way they gather, use and create knowledge (elaboration from: Conole, *et al*., 2006, pp.5-6).

6.2: The pilot phase of the research LV@USI-SUPSI

Taking into account the informing results of the JISC consortium research, during the winter semester of academic year 2008-2009, at NewMinE Lab the pilot phase of the LV@USI-SUPSI research project took place.

As the acronym reveals, the philosophy behind the observation was really to listen to the voice of learners; in the researchers’ minds such principle was strategic in order to not establish *a priori* any results.

The main aim of this step was to set, define and customise the investigation tools. According to the JISC protocol, a combination of qualitative and quantitative methods was pursued (see: http://www.jisc.ac.uk/whatwedo/programmes/elearningpedagogy/learneroutcomes/learnervoices).

6.2.1: Defining the methodology

During this step, it was decided to have a little sample of selected people, namely students of a bachelor course in eLearning (at Communication Science of USI). Since the aim was to define tools, the disadvantage of not having a random sample, was

considered to be balanced by the advantage of contacting people interested and engaged in the topic.

Concerning the quantitative part, the project used almost the same version of the online questionnaire used by JISC researchers. On the qualitative side, the choice was to do four semi-structured video interviews.

Two main problems needed to be solved: the online survey was too long and complex; and the data collected from interviews were not enough informational rich.

In order to get an idea of how deep the questionnaire was, it must be considered that it included four grids like the following one; and people needed almost one hour to complete it.

9. Activities using technology

Please indicate in the table below what kinds of digital technologies you use in your studies overall rather than any specific course you may be taking.

Use the codes 1 = a little, 2 = moderately, and 3 = a lot. Leave blank any squares that do not apply.

Please write in any additional technologies and/or activities, if required, in the spaces provided.

	Digital audio	Digital video	Pod-cast	CD/DVD	Electronic whiteboard	iPod/Mp3 Players	Laptop/Desktop Computer	Mobile Phone (including texts)	PDA	Memory stick	Digital Camera	Scanner	Voting system	Multimedia Player
Communicating with students	3													
Communicating with family/friends														
Communicating with tutors/teachers														
Doing a learning task collaboratively														
Doing a learning task individually														
Gathering information														
Listening to course material														
Managing information														
Oral presentation														
Planning a group learning task														
Planning a individual learning task										2				
Reading course material														
Revising for an exam														
Self assessment exercises					1									
Viewing course material														
Writing an assignment														

Fig. 34: sample of the questionnaire in the pilot phase

6.2.2: Lessons learned from the pilot phase

So, the online questionnaire was shorten and narrowed, and questions focused mainly on the learning aspects of using ICTs, rather than on the digital life as a whole.

Then, concerning the qualitative part, a quasi-ethnographic method was elaborated, tested, customised, and validated by experts in the field of ethnographic research. The "serious playing" methodology – using LEGO bricks – was adopted.

The pilot phase put also in evidence the need to adopt a self-selected sample, in order to avoid the observer's prejudice and to collect data expressing a bigger variance.

6.3: The research framework: considering LoDE map

Parallel to the effort in the methodological setting, during the winter semester of 2009, the theoretical framework was structured in order to comprehend the review of rhetorical artefacts and trends. Then, the LoDE map was applied; it works as a tool for the overall questions about the dichotomy "learners and new media": who are the learners of the digital era as a whole? Which are – and are said to be – their dominant traits? Is it possible to identify variables/factors/elements in order to explain a better familiarity toward digital learning?

6.3.1: Four dimensions of expectations on LoDE

In chapter 3, (fig. 29"synthetic model about the impact of ICTs on society") a *criterion* is presented to categorise the corpus of expectations on LoDE, which can be adopted to group what emerged from the literature. The frame-concept is that the impact of ICTs on society affects four areas: social-communication area; psycho–cognitive area; working experience; and learning context. From the review of rhetorical artefacts and trends we also know that LoDE are said to be technically-more-equipped in using ICTs.

Then we can identify four dimensions of expectations on LoDE; in the literature they are described – even if in various ways – as *different*:

1. for their technical abilities with ICTs;

2. in their cognitive skills;
3. acting in the social arena;
4. in their learning experiences.

According to such four dimensions, the following table is offered. For each row (addressing one dimension), the main assumptions about LoDE typical traits are outlined. In the third column, the strategies to measure the expressed expectations are highlighted.

The taxonomy concerning LoDE (the structure of four dimension discussed here) is, first, detailed, and, then, combined with LoDE perspective; as shown in figure 27.

Tab. 9: LoDE, from predicted traits to strategies of measurement

Dimension of expectations on LoDE		Hypotheses and open issues	Measurable effects, observable variables, descriptors
1	Technically	- LoDE have a "technological potential" or a "media skill" - this is a know-how expected to be somehow transferable from informal to formal experiences	measurement of ICTs access, usages and familiarity
2	In socio-cognitive skills	According to Holt's words (Holt, 2009, p.2): - they are intuitive visual communicators, - they are better able to integrate visual spatial skills, - they learn better by discovery than being told, - they can shift their attention easily from one thing to another, - they have a fast response time and demand fast turnaround time as well	record of new cognitive skills related to ICTs
3	In the social arena	In William and Strauss' assumptions (Strauss & Howe, 1991), LoDE are described as: - special, - sheltered, - confident, - conventional, - team-oriented, - achieving, - pressured	observation of different social behaviours related to ICTs
4	In learning experiences	Junco and Mastrodicasa depict their learning styles around four characteristics (Junco & Mastrodicasa, 2007): - driven to success, goal-oriented, - social: they love to interact in learning, - experiential learners: by learning with PCs, they developed the trial-and-error way of thinking, dislike instructional manuals and like to gather information surfing freely on the internet, - multitasking Plus the following addendum (Holt, 2009, p.2): - they prefer to work in teams, - they are achievement oriented and like structure as opposed ambiguity, - they like interactivity and a rapid pace. They may need to be encouraged to stop and reflect, - they are more comfortable with visuals than with text, - they like to be involved in community activities and believe they can make a difference, especially using science and technology	investigation of competence(s) transfer from leisure activities (informal learning) to education performances (formal learning)

Each single abovementioned expectation constitutes an hypothesis to be verified or opens up a cluster of issues and questions which need to be explored.

6.3.2:Abstracting expectations thanks to LoDE map and taxonomy

A great number of expectations, covering different dimensions and aspects, represents an handle-with-care issue; sure enough we can not consider all the above bulleted points like a checklist, in order not to transform the discourse around LoDE into an oversimplification. As discussed in par. 2.4, it is better to avoid overgeneralisations and oversimplifications when a research involves human beings.

In light of that, it is useful to keep the dimensions expressed in previous paragraph and to cross them with the taxonomy outcome from the LoDE map (see parr. 3.2 and 3.4). Excluding the dimension related to work and taking apart the one concerning technical abilities, three areas emerge: social, cognitive, and learning.

In the two tables below enthusiasts' and concerned individuals' taxonomies one are crossed with the three (out of four) areas identified for this dissertation (since, as said, the technological one is not part of this dissertation).

Tab. 10: areas of investigation crossed with enthusiasts' taxonomy

	Area
1. *Effects of digital familiarity/behaviours*: changes in learning-related behaviours due to the presence of digital technology in social activities.	Learning
2. *Effects of digital routines/behaviours*: changes in cognitive processes and behaviours due to the presence of digital technology in everyday life (psycho-cognitive approach).	Cognitive
3. *Generational characteristics*: socio-cultural differences among generations.	Social
4. *Impact of digital environment*: societal changes due to digital context affecting everyone.	Social
5. *Impact of digital familiarity*: societal changes due to digital experiences affecting particularly young people.	Social
6. *Impact of internet*: specific focus on spread of the "network logic" and internet experiences.	Learning
7. *Millennium turn*: specific focus on the historic-cultural aspects of the millennium turn.	Social
8. *Technological development*: specific focus on the overall impact of technological development over society	Social

Tab. 11: areas of investigation crossed with concerned ones' taxonomy

	Area
1. (Bad) effects of digital behaviours, namely the social outcomes of routinely digital experiences.	Cognitive
2. Change in behavioural skills.	Social
3. Change in cognitive skills	Cognitive
4. Generational characteristics (this point is the converse equivalent of the nr.3 for the enthusiasts' group).	Social
5. Media violence	Social

The rationale behind such schemas is to narrow and define the exploration of LoDE characteristics. In other words, "cognitive", "social", and "learning" constitutes the areas

where it is expected to find something peculiar or typical related to LoDE; because the taxonomies put in evidence what – according to the literature– is predicted to be specifically *different*, and then observable.

Finally, it is important to repeat that the three areas are interconnected and it is impossible to consider them as apart from each others, being the taxonomy an artificial abstraction to navigate the significant variance of commentators about this topic.

6.4: The research architecture and research questions

From the application of LoDE perspective to the corpus of information about learners, a number of issues emerges: is age a good independent variable to identify skilled learners facing ICTs? Or, is there some peculiar trait attributable to LoDE younger than 30 years old? Are there learning attitudes and patterns typical of the "north-western world" culture, which is more and more ICT-dependent and media-rich? Does our "media diet" modify our learning behaviours? How is this different for digital learners? Which kind of use and appropriation of new ICT are made by younger people? Is there a connection between the issues raised during the adoption phase and the dropout phenomenon? How is that configured for digital learners? Which are the new "cultural actions" for the "knowledge society"? Is the "digital learners approach" appropriate to inform instructional designers all over the world? How to integrate the eLearners' point of view in eDidactics methodology , taking into account the actual ways they use ICTs?

Then, the research process asked to develop the above issues into a clear and well-defined research architecture.

As one can notice, some of the above points of analysis are more than simple questions; because of that, the research architecture was built combining quantitative and qualitative inquiries. Whenever it was possible, hypotheses have been provided to be verified/falsified in the quantitative part, throughout a questionnaire; otherwise, the research defined open questions, addressed in the qualitative parts thanks to semi-ethnographic methods (i.e.: media diet diaries, and LEGO sessions).

Moreover, as introduced in parr. 6.1 and 6.2, the main lesson learned from the JISC's work was the need to diversify the investigation between direct questions and hypotheses on ne side, and open questions on the other side.

The following schema explains the elaboration from the general theme to the protocol of analysis.

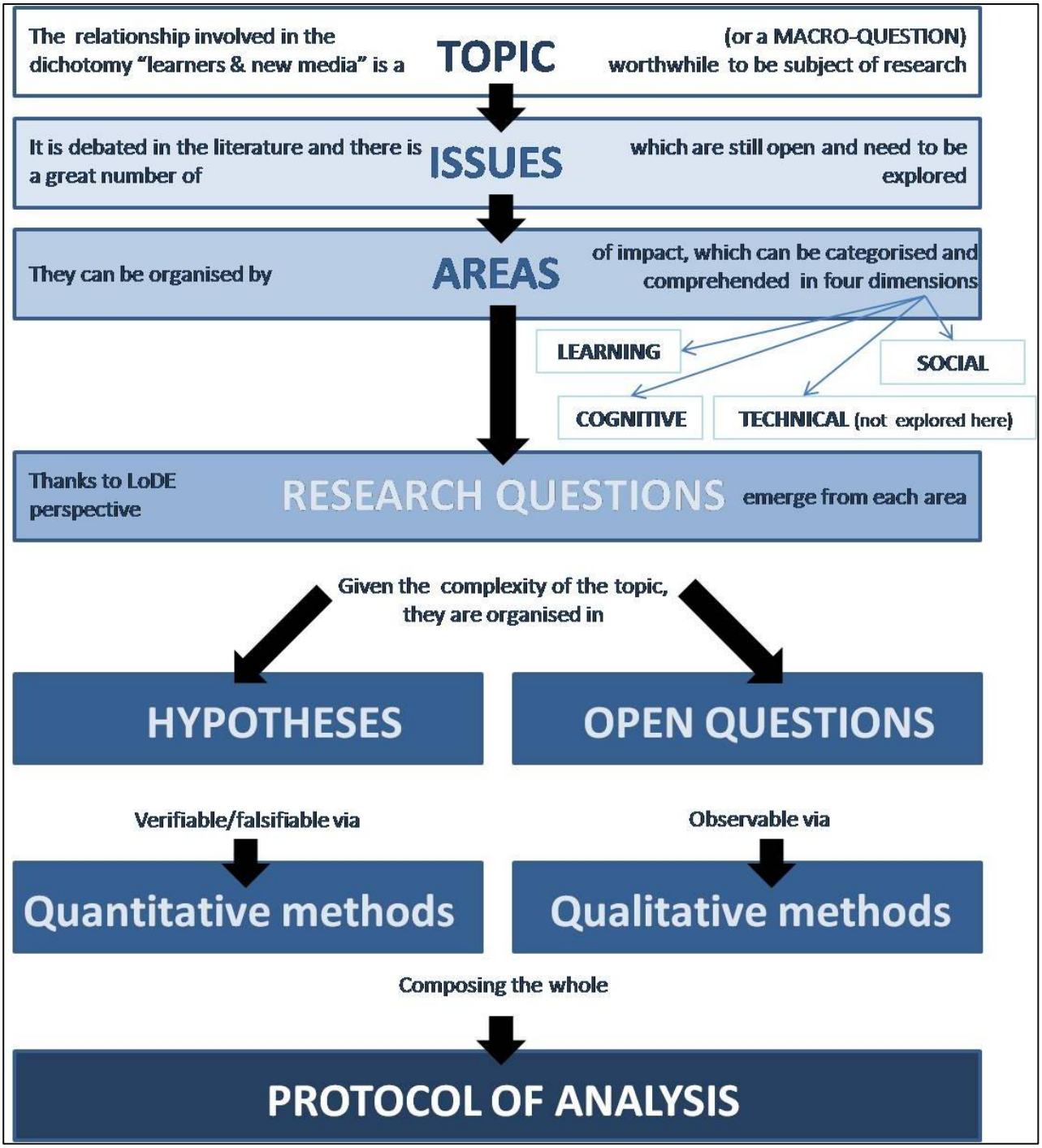


Fig. 35: architecture of the research process development

At the end of this in-depth process of analysis and synthesis, the final protocol of research offered seven hypotheses and four open questions, presented in the two following sub-paragraphs.

6.4.1: Hypotheses

The list of hypotheses comprehends expectations on LoDE, emerging from the technical and learning areas. In the column "indicators-measurable aspects", it is indicated the related strategy of observation.

Tab. 12: the research architecture – hypotheses

Hypotheses	Indicators - Measurable aspects
1. The presence of ICTs in LoDE experience is massive	Descriptive statistics of owned ICTs
2. ICTs' usages are more related to leisure purposes than to learning ones	Usages' comparisons
3. ICTs' adoption for learning goals is statistically significant for a basic level of learning	Statistical manipulation of dataset: creation of new variables and factor analysis
4. ICTs predilection in learning contexts is explainable/predictable thanks to a. Age variable b. Country of origin c. Gender d. Field of studies	Crosstabs composed by demographic questions and items related to digital learning
5. LoDE request for more ICTs in formal learning	Question about factors that make an ICT appealing for learning purpose + Mobile learning development
6. eLearning is the preferred way to learn	Investigation of eLearning perception
7. LoDE express a learning-style pattern digitally oriented	Questions about preferences of ICTs in learning

6.4.2: Open questions

As pinpointed in paragraph 2.4, the theoretical framework in which this research is fixed, the intrinsic anthropological complexity of learners as human beings, calls for a multidimensional strategy of inquiry. This is why numbers coming from quantitative methods have been considered inadequate in this dissertation. Open questions pair with the abovementioned hypotheses; qualitative, and quasi-ethnographic, methods were customised to be strategies of investigation coherent with the goals of analysis. Handling these complex issues of social, cognitive, and learning areas, strategies of observation have been diversified, as shown in the second column of the following table.

Tab. 13: the research architecture – open questions

Open question	**Strategy of inquiry**
1. Which is the perception LoDE have of their media diet, and how does it influence learning behaviours?	Media diet diaries + discussions in class with participants
2. Which is the relevance of digital experiences for learning?	Self-projection methods (using metaphors) + shared analysis of results
3. Is it observable a skill transfer from informal contexts of learning to formal ones?	Self-projection methods (using metaphors) + shared analysis of results
4. Are LoDE bearers of a peculiar technological potential useful for learning purposes?	Self-projection methods (using metaphors) + shared analysis of results

According to the principles of research in social sciences (Viganò, 1999), the hypotheses and the open questions must be considered like the *object* of analysis, in the following paragraph the subjects and a clarification about the strategy will be discussed.

6.5: The research methodological plan

The methodological journey of this chapter gets now to the step of presenting the subjects involved in LV@USI-SUPSI. So far we have mainly discussed what the research is intended to study; in par. 6.5.1 we will see who the population of USI-SUPSI is, and how they were sampled; par 6.5.2 is devoted to explain how the research questions are meant to be combined.

6.5.1: Sampling – who observed whom?

The research LV@USI-SUPSI was carried on at the USI – Università della Svizzera italiana (University of Lugano) and SUPSI – Scuola Universitaria Professionale della Svizzera Italiana (University of Applied Sciences and Arts of Southern Switzerland).

The involved actors in the research process were: eLab (eLearning Lab USI-SUPSI), funding and spreading the quantitative part, engaged with the goal to offer concerned eLearning services to the academic institutions of Ticino; NewMinE Lab (New Media in Education), in charge of setting the research methodology; the Gender service of USI-SUPSI, co-promoting the research because of an high interest in results.

Each actor brought a significant know-how, in terms of attention to: technical and didactical aspects (eLab); pedagogical and communicational issues (NewMinE Lab); sociological controversies (Gender service). Such a team assured to the whole research project the needed interdisciplinary approach.

Going further in describing USI and SUPSI, it must be said that the two institutions represent most of the higher education offer in Ticino, the Italian speaking canton of Switzerland (together with part of Grigioni). Together, they count almost five thousands students.

USI departments are:

- Academy of Architecture
- Faculty of Communication Sciences

- Faculty of Economics
- Faculty of Informatics

And SUPSI departments are:

- DACD Dipartimento ambiente costruzioni e design (Department for Environment Constructions and Design)
- DFA Dipartimento formazione e apprendimento (Department Teaching and Learning)
- DSAN Dipartimentosanità (Department of Health Sciences)
- DSAS Dipartimento scienze aziendali e sociali (Department of Business and Social Sciences)
- DTI Dipartimento tecnologie innovative (Department of Innovative Technology).

It has to be reported a great number of executive masters at USI and many professional courses at SUPSI, which are not mentioned here because their students were not involved in the research.

Then, it must be added that people attending SUPSI are not infrequently adults, in the condition of student workers.

Few words about the *milieu* where the research was carried out are worthwhile. Ticino constitutes an interesting context where to set such a study. Its economic-financial indicators are very highly ranked and the level of digital permeation is among the top ten in the world. According to the latest ICT Development Index (IDI), by the International Telecommunication Union (ITU), Switzerland was ranked at the seventh place in 2008. The IDI measures the situation of the Information Society, based on 11 indicators observing each country's level of access, use, and competences related to ICTs (the report is available, in pdf format, at http://www.itu.int/ITU-/ict/publications/idi/2010/Material/MIS_2010_without%20annex%204-e.pdf).

Because of its strategic position (in Switzerland, in the core of Europe) there is a lot of immigration, which is, anyway, strictly controlled. More specifically, Ticino is very rich,

highly technologized, multicultural, and multilingual. This Swiss region expresses a peculiar "glocal" feeling(Cantoni, Rapetti& Tardini, 2010).Therefore, studying the Learners of Digital Era in Ticino is a peculiar and very informing sample.

Coherently with the socio-economic environment of Ticino, both USI and SUPSI are remarkably technologised.

Concerning the infrastructures, computers, video-beamers, and internet connection are available in classes. Very often, students attend lessons using laptops or other portable devices, connected to the campus wireless. Moreover, ELab provides a customised version of Moodle LMS platform.

An elucidation about the cited departments is a needed preamble about he empirical phase. It is better to consider each faculty or department in terms of specific and contextualized "learning cultures"; in other words they must be considered neither like the expression of an univocal learning&teaching style promoted by the institution, nor like general models. Rather, they have to be observed like specific cultures, outcome of particular factors more related to the deans' attitude, to the relationships linking professors, and to the students' behaviour.

The concept of "learning culture" (Jenert, *et al.*, 2009; Jenert, 2011) is an important point to understand the knowledge society and its facets related to human interactions.

In our reading of the concept, it seems deeply connected to the spread of digital devices, because of the challenges both for the idea of learning and of culture. In NewMinE Lab understanding (Cantoni, Botturi, Succi *et al.*, 2007, p.45), an organization can express a common sense and practice of learning when it shares rites, myths, and models; which constitute the organization learning culture. Thanks to the image coming from the LEGO sessions (see par. 7.3), it will be easy to comprehend how powerful is the learning culture in orientating identities.

Characteristics and specifities of a given learning culture come out also from the number of people involved, the gender balance, and the country of origin. At the moment of

observation, the two institutions counted a population of 4449 students of bachelor and master courses, with a reasonable balance between female and males.

Both institutions have a rather international catchment area. Especially for what concerns USI, the breakdown reveals a predominance of people coming from abroad. According to enrolment data of academic year 2008-2009 (see http://www.usi.ch/en/studenti-usi-en-12350.pdf), 41,1% of students came from Switzerland and 58,9% from abroad; the most represented communities are: students coming from Ticino within the Swiss people (in frequency: 781);students coming from Italy within group of non-Swiss people (in frequency: 897; 36,1% of the total).

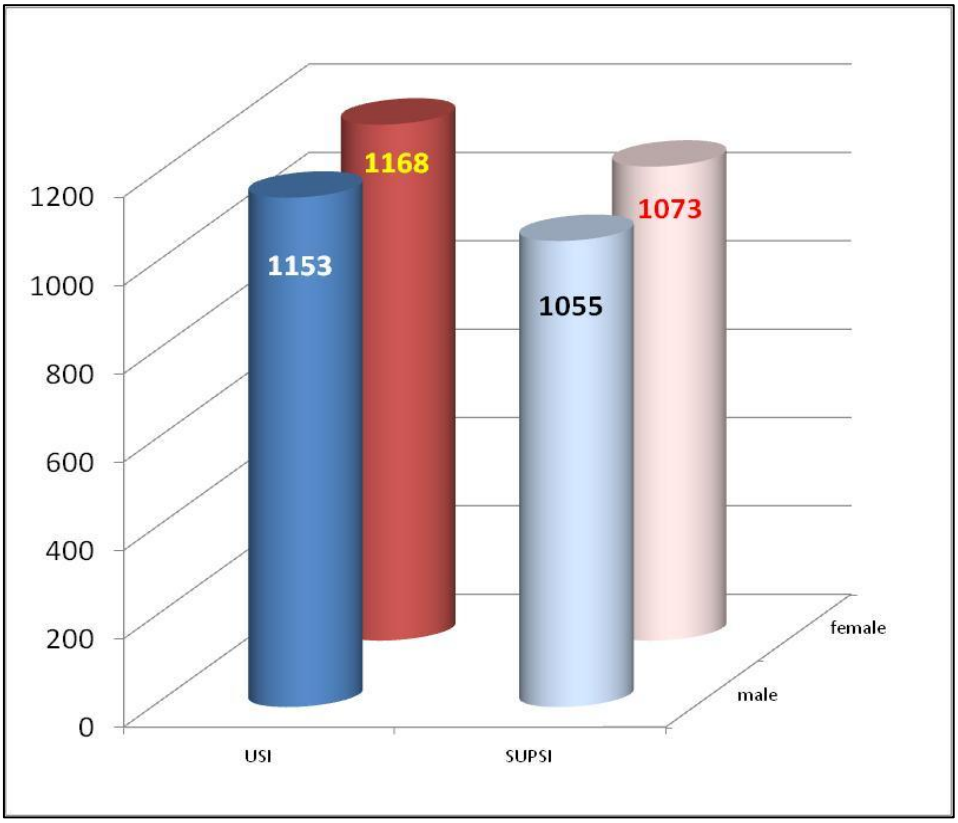


Fig. 36: population of USI-SUPSI per gender

For updated information about data of Ticino university institutions, see http://www.usi.ch/container_target_press_area/about_profile_statistics/profile_statistics_laureati_usi.htm.

LV@USI-SUPSI took place in within the described reality. Taking into account the experience of pilot phase, researchers adopted an anonymous self-selected sample for the quantitative part; concerning the qualitative one, people were contacted personally according to the need to realise at the largest possible variance within the population. The final sample was composed by 562 respondents to the online questionnaire, and 22 active participants plus 19 observers/contributors (total: 41 people) to the qualitative phase. This second phase involved two LEGO sessions and three media diet diaries.

To quantitatively determine the statistical significance of the sample set of the student population, the following formula was used:

$$n = \frac{N \cdot \hat{p}\hat{q}\left(z_{\alpha/2}\right)^2}{(N-1)\,E^2 + \hat{p}\hat{q}\left(z_{\alpha/2}\right)^2}$$

This formula includes the finite population correction factor, because we consider populations that are statistically relatively small. **N** is the size of the considered population (i.e., 4449 students); **pˆ** is the expected proportion of student expressing a specific behaviour (e.g., like the usage of mobile devices for learning), while **qˆ** is (1-pˆ) (e.g., students not liking the usage of mobile devices for learning); **E** represents the margin of error, and $\mathbf{z_\alpha/2}$ is the critical value [1] associated with the chosen confidence level. In our experiment, since the proportion (**pˆ**) of students showing a certain behaviour is not known a priori, we consider the worst case scenario (i.e., pˆ · qˆ = 0.25). Thus, we measure that our sample set size gives us a *confidence level of 99%* and *error (E) of 5%*: If a feature is shared among f% of the sample set students, we are 99% confident that the feature is present in the f%±5% of the whole population of students. This validates the quality of this sample set as an exemplification of the entire population (Triola, 2006). It must be underlined that – although the risk of bias exists because of self-selection of the respondents – such a sampling procedure has been set in order not to predetermine any results due to the observer's prejudice.

Coherently to what expressed in par. 6.4.1, the strategy to verify variables was identified in a revised version of the JISC questionnaire. Also in our case, it was internet-based. The questionnaire was made available in Italian and English and remained online over 3 weeks, from September 28 to October 19, 2009. In order to make people participate, an email invitation was sent to all the students and a web link has been put on the homepage of the online platform for eLearning facilities. Departments' deans gave their support to this action and this was clarified in the mail. A second mail reminder was sent about ten days later.

As said, at the end 562 questionnaires were collected.

The qualitative part was significantly longer: from December 2008 to March 2011. The complete qualitative dataset is composed of the following:

- 2 LEGO sessions, involving 24 people, split in 19 active participants and 5 observers;
- 3 media diet diaries, involving 3 people compiling and 14 observers/helpers, discussing all together the outcomes.

6.5.2: Strategy – observing how?

As mentioned before, qualitative and quantitative parts needed to be combined, according to a principle of co-necessity: there is a circle by which one explains the other and *vice versa.* Then, they must be considered in parallel even if their methodological paths are separated, as shown in the next picture. In the results the outcomes of verified variables and addressed themes will be combined.

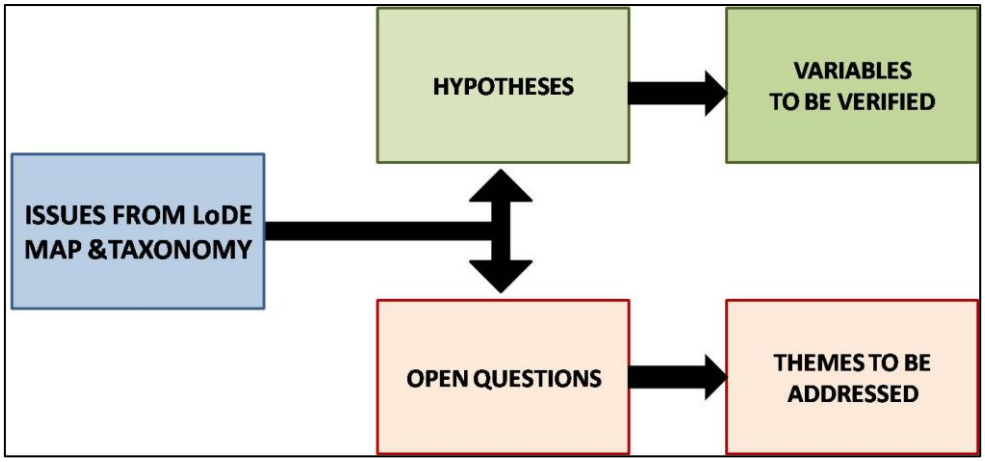


Fig. 37: co-necessity of quantitative and qualitative analyses in LV@USI-SUPSI

A sound methodological research in human and social sciences is asked to adopt a recursive protocol between gross numerical data and in-depth analysis (Bayleys, 1995). As put in evidence by Viganò, each protocol of analysis based on quantitative data will need to be enlightened by information retrieved from the literature or through different methods (Viganò, 1999).

Also in the background documents coming from JISC consortium it is possible to find advices which push to combine qualitative and quantitative research:

> After gathering data at the level of individual students, the research team used several analytical methods to analyse each case study individually followed by an overarching study across the cases (study of cases). The central purpose of analysing the qualitative data was to extract, generalise and abstract from the complexity of the data, evidence concerning eLearning activities and experiences in order to answer the main research questions. Relevant extracts from the interviews were transcribed and used to complement and extend the survey and audio logs findings(Conole, *et al*., 2008, p.513).

In reason of the above argumentations, and taking into account advices coming from the theoretical framework discussed in chapter 2, a combination of numerical data and quasi-ethnographic ones was considered to be the best choice.

6.6: The research tools of investigation

At the end, the research protocol defined the investigation's tools: an online questionnaire for the quantitative part, using an online service; a combination of methods for the qualitative one.

6.6.1: The quantitative part: online questionnaires

According to the mentioned goals, questions were developed aiming to obtain data organized around the following points:

- Personal data (name, email, age, gender, course, country, course, enrolment year);
- Owned digital technologies;
- Access to the internet;
- Online activities and frequency of usage;
- Most used applications;
- The role of ICTs everyday life;
- Learning preferences (in general and concerning ICTs);
- The role of ICTs in studies/learning experiences;
- eLearning perception;
- Rationales in using ICTs for learning.

It is worthwhile to pinpoint that some areas were explored throughout a set of items which were in a single question. Because of that, 9 grids appear in the questionnaire; two of them involve a significant number of variables. In reason of the great number of items in the questionnaire, and considered the new variables created for data treatment, the output Excel file counted 734 variables; besides, in SPSS treatment, other 25 variables have been added (in order to elaborate data for the factor analysis).

In order to avoid the response setting – that is the propensity of the respondent to answer in a mechanical way, providing a series of identical responses, without thinking about the meaning of questions – (Ortalda, 1998), in questions asking similar things researchers opted for different scales or reversed scales; of course such a choice implied more problems in the analysis phase. While, to avoid an high level of abandon, the whole questionnaire was designed to be easy to read and fast to be answered; following this rationale, grids of JISC's original questionnaire were transformed in lists every time it was possible.

6.6.1.1: The final version of the questionnaire

The following schema shows how the 25 questions composing the questionnaire were set, grouped in 7 pages, after the introduction page.

Tab. 14: questionnaire's structure

p	Page title		Question	Type
1	Introduction			
2	Personal data			
		1	Name	
		2	Email	
		3	Year of birth	
		4	Gender	
		5	Country of origin	
		6	Course	
		7	Enrolment year	
3	Technologies you have			
		1	Owned digital technologies	list
		2	Time per day of internet connection	grid
4	Online activities			
		1	Frequency of online activities	grid
		2	Frequency of reading newspaper and books	grid
		3	Frequency of using TV and radio, and of listening music	grid
		4	What has been improved by ICTs and by what amount	grid
		5	*Question about eTourism, hosted in this questionnaire for another research*	*list*
5	Learning preferences			
		1	Preferred places to study	list
		2	Preferred strategies to learn, and how much	grid
		3	Rationales for choosing a classmate to collaborate	list
		4	Preferred technology to interact	list
6	Technologies you use for learning			
		1	ICTs and online facilities used in studies	list
		2	Communication tools preferred in studies	list
7	Preferences	1	3 most favourite technologies	open question
		2	3 most disliked technologies	open question
8	eLearning	1	Appreciation's and perception's scale of eLearning	grid
		2	Rationales for using ICTs in learning	grid
		3	Characteristics of a new learning tool motivating in adopting it	grid

The questionnaire was released through the online service Surveymonkey®. The two following screenshots show how it looked like. The first sample shows the "introduction" page; the second one shows a grid.

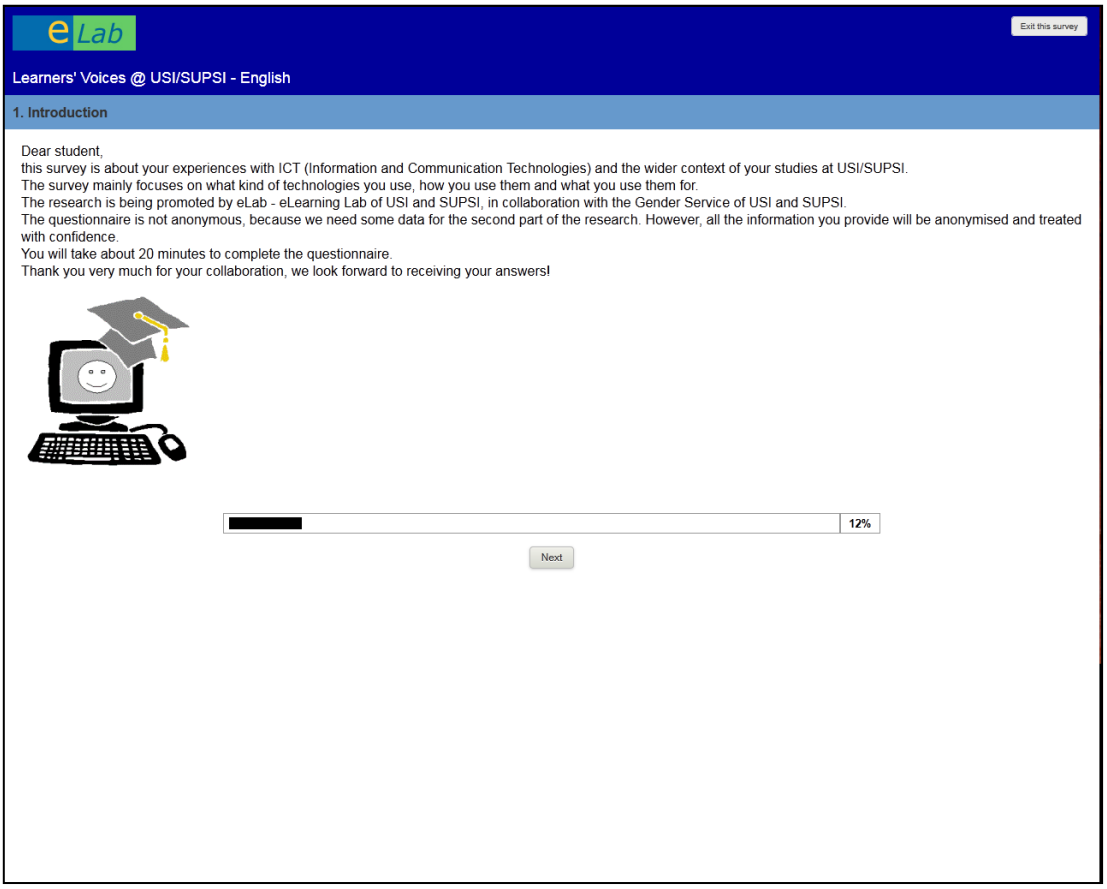
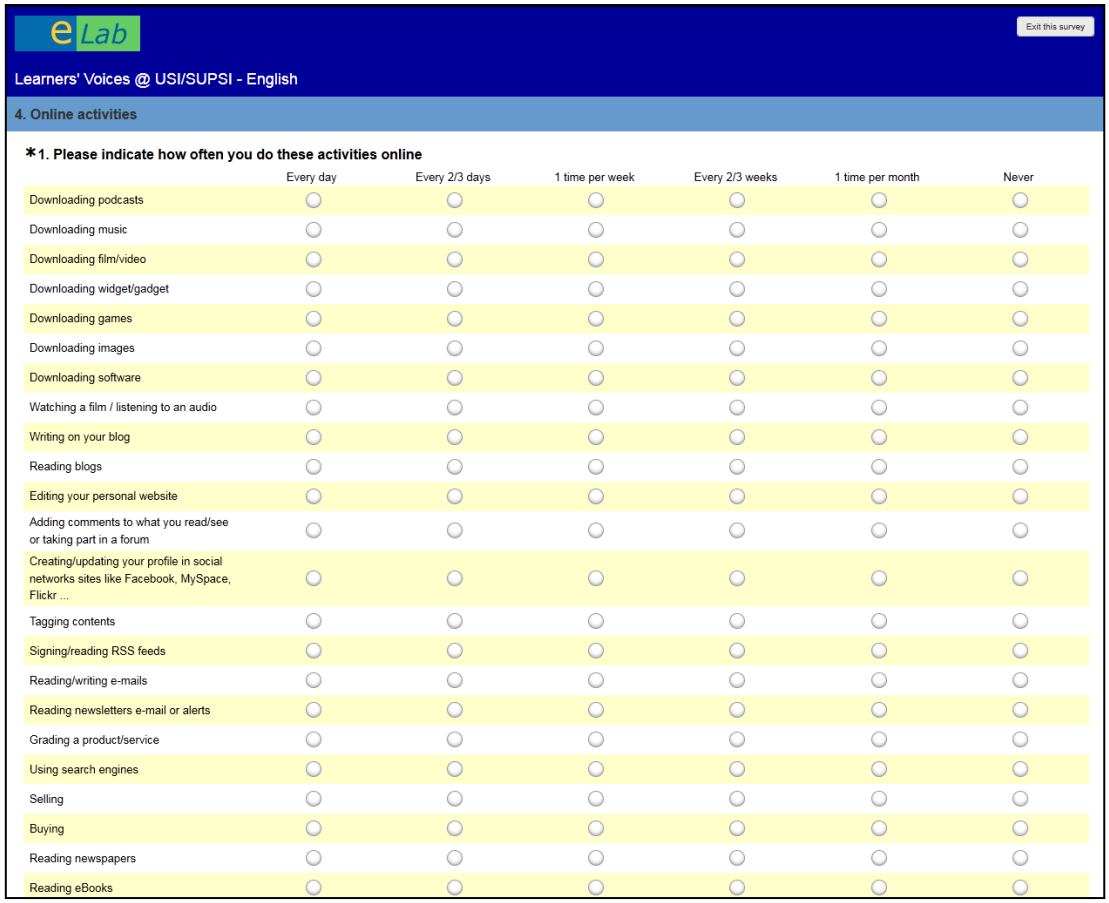


Fig. 38: questionnaire's screenshot sample 1 – the "introduction" page



eLab

Exit this survey

Learners' Voices @ USI/SUPSI - English

4. Online activities

*1. Please indicate how often you do these activities online

	Every day	Every 2/3 days	1 time per week	Every 2/3 weeks	1 time per month	Never
Downloading podcasts						
Downloading music						
Downloading film/video						
Downloading widget/gadget						
Downloading games						
Downloading images						
Downloading software						
Watching a film / listening to an audio						
Writing on your blog						
Reading blogs						
Editing your personal website						
Adding comments to what you read/see or taking part in a forum						
Creating/updating your profile in social networks sites like Facebook, MySpace, Flickr ...						
Tagging contents						
Signing/reading RSS feeds						
Reading/writing e-mails						
Reading newsletters e-mail or alerts						
Grading a product/service						
Using search engines						
Selling						
Buying						
Reading newspapers						
Reading eBooks						

Fig. 39: questionnaire's screenshot sample 2 – the "online activities" page (q. 4.1)

All the statistics have been done thanks to SPSS® (version 17.0) software; while graphs have been elaborated in Microsoft Excel 2007®.

6.6.2: The qualitative part: media diet diaries and LEGO sessions

The complexity implied by open questions generates the need to develop a versatile and complex methodology to collect qualitative data.

The main research aim of the qualitative part was to provoke a critical and conscious reflection about the role of ICTs in LoDE' s learning experiences. Semi-structured interviews – adopted in the pilot phase – seemed to be inadequate, since interviewees tended to answer with *clichés* or platitudes (e.g.: "which is the role of ICTs in your learning experience?""My laptop is very important for my studies""Why?""Because I

can download materials and bring it along with me”). Though, it was also clear the risk to implement the observer’s view, so LV@USI-SUPSI asked to adopt methods able to arouse a deeper awareness about experiences and feelings concerning ICT’s usages.

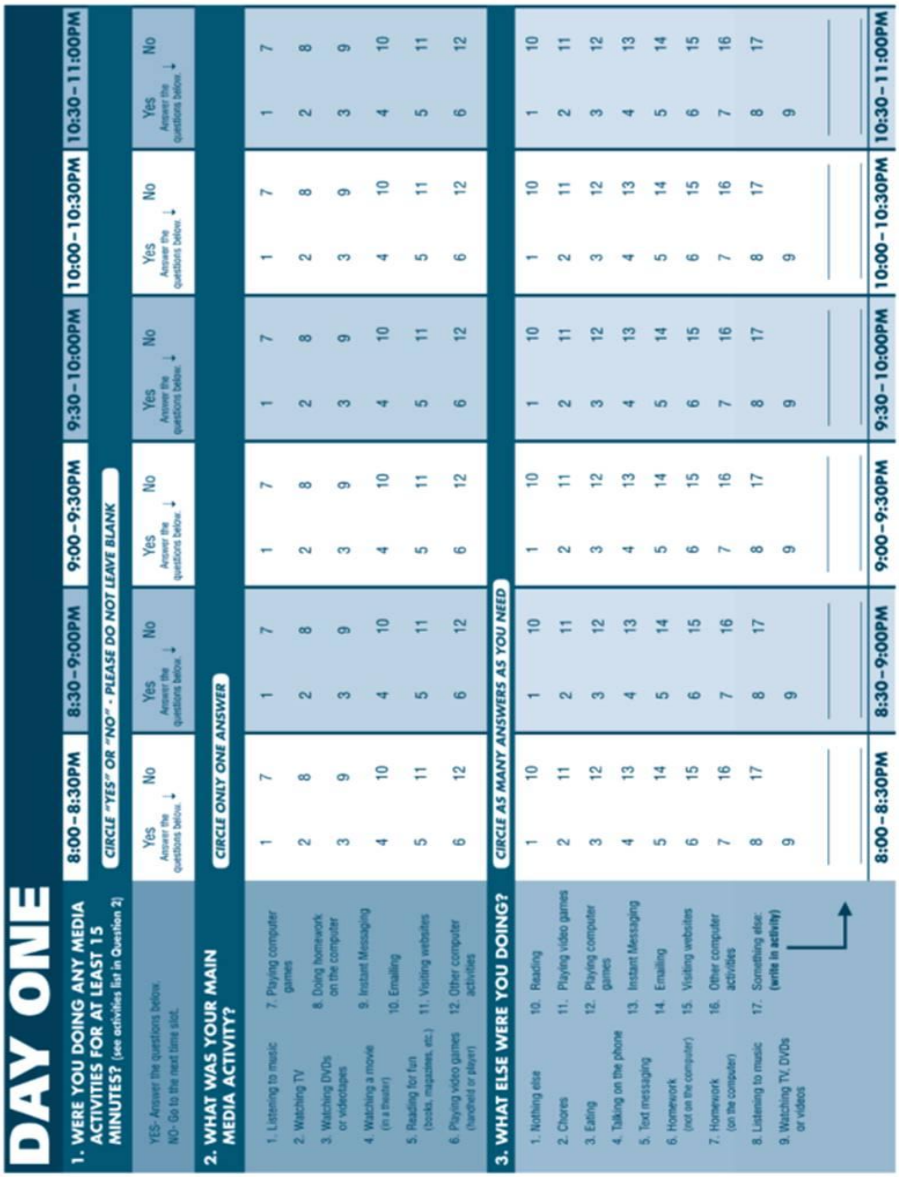
Two tools seemed to fit well this goal: the metaphorical use of LEGO and media diet diaries. Anyway, information collected via interviews during pilot phase are part of the broader corpus of knowledge working as inspiring material for this research.

6.6.2.1: Studies on multitasking and media diet diaries

The methodological description of tools used in LV@USI-SUPSI includes media diet diaries. They were used twice in the research with the aim of eliciting awareness about the pervasiveness of digital in learning experiences and to discuss results.

In paragraph 2.2.2.1, the concept of “media diet” has been presented for its theoretical assumptions. The media diet diary is a tool conceived to register any usage of digital media during a given period; normally, a whole day, or a whole week; rarely longer periods are observed because of its being a quite time-consuming practice.

Studies on multitasking can be considered the most significant step in giving to media diet diaries a structure (and a literature). The standard elaborated by Kaiser Family Foundation is valuable and interesting to be observed (Ridehout, *et al.*, 2010). Indeed, it was conceived to check and sort carefully a typical adolescent’s day, concerning media usages. The protocol was meant to retrieve data for any activities done – at least – for 15 minutes. The next picture shows a sample of it.



DAY ONE

1. WERE YOU DOING ANY MEDIA ACTIVITIES FOR AT LEAST 15 MINUTES? (see activities list in Question 2)		8:00–8:30PM		8:30–9:00PM		9:00–9:30PM		9:30–10:00PM		10:00–10:30PM		10:30–11:00PM	
		CIRCLE "YES" OR "NO" - PLEASE DO NOT LEAVE BLANK											
YES- Answer the questions below. NO- Go to the next time slot.		Yes Answer the questions below. ↓	No	Yes Answer the questions below. ↓	No	Yes Answer the questions below. ↓	No	Yes Answer the questions below. ↓	No	Yes Answer the questions below. ↓	No	Yes Answer the questions below. ↓	No
2. WHAT WAS YOUR MAIN MEDIA ACTIVITY?		CIRCLE ONLY ONE ANSWER											
1. Listening to music	7. Playing computer games	1	7	1	7	1	7	1	7	1	7	1	7
2. Watching TV	8. Doing homework on the computer	2	8	2	8	2	8	2	8	2	8	2	8
3. Watching DVDs or videotapes	9. Instant Messaging	3	9	3	9	3	9	3	9	3	9	3	9
4. Watching a movie (in a theater)	10. Emailing	4	10	4	10	4	10	4	10	4	10	4	10
5. Reading for fun (books, magazines, etc.)	11. Visiting websites	5	11	5	11	5	11	5	11	5	11	5	11
6. Playing video games (handheld or player)	12. Other computer activities	6	12	6	12	6	12	6	12	6	12	6	12
3. WHAT ELSE WERE YOU DOING?		CIRCLE AS MANY ANSWERS AS YOU NEED											
1. Nothing else	10. Reading	1	10	1	10	1	10	1	10	1	10	1	10
2. Chores	11. Playing video games	2	11	2	11	2	11	2	11	2	11	2	11
3. Eating	12. Playing computer games	3	12	3	12	3	12	3	12	3	12	3	12
4. Talking on the phone	13. Instant Messaging	4	13	4	13	4	13	4	13	4	13	4	13
5. Text messaging	14. Emailing	5	14	5	14	5	14	5	14	5	14	5	14
6. Homework (not on the computer)	15. Visiting websites	6	15	6	15	6	15	6	15	6	15	6	15
7. Homework (on the computer)	16. Other computer activities	7	16	7	16	7	16	7	16	7	16	7	16
8. Listening to music	17. Something else: (write in activity)	8	17	8	17	8	17	8	17	8	17	8	17
9. Watching TV, DVDs or videos		9		9		9		9		9		9	
		8:00–8:30PM		8:30–9:00PM		9:00–9:30PM		9:30–10:00PM		10:00–10:30PM		10:30–11:00PM	

Fig.40: media diet diary sample, from studies on multitasking
(Source: Ridehout, *et al.*, 2010)

Even if the tool is useful, it must be remarked that multitasking is a tricky expression, as discussed in par. 3.1.2.1.3. According to Creenshaw, it is preferable the concept of "switch-tasking"(Crenshaw, 2008)

In LV@USI-SUPSI the problems related to multitasking (or fast-switching, or switch-tasking) were not object of investigation, therefore existing protocols were taken as basic

tools. At the end, researchers decided to collect data from three media diet diaries: two taken daily, following a grid similar to the KFF one in which every action implying a digital media had to be written down, timed, categorized as informal/formal learning, and explained; and one taken weekly, meant to group all the recurring actions per used media. In this second protocol each recurring action had to be documented through a picture. Both protocols were conceived to be easy and soft, since the goal was not a numerical feedback about usages, but to stimulate reflection and collect data from the discussions. Here below there is a sample for each protocol.

Tab. 15: blank grid for daily media diary in LV@USI-SUPSI

Date / Time	Technology	Learning	Goal	Usage description

.

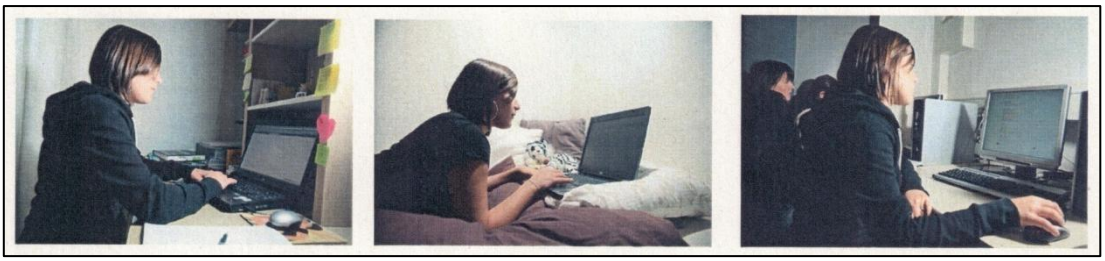


Fig. 41: sample of grouping for weekly media diary in LV@USI-SUPSI – "computer"

In this stage of research, eLearning students of class 2009-2010 were very helpful both in the tool designing and in collecting data; their contributions were part of the final evaluation of the course.

6.6.2.2: LEGO sessions methodology

It has first to be clarified that what we call "LEGO session" is an original, reduced, and customized version of the renowned LEGOSERIOUS PLAY(in short, LSP) released by LEGO Inc.

6.6.2.2.1: “The science of LEGOSERIOUS PLAY”

The above expression between quotes is the title of a little booklet (Roos & Victor, 2002) which describe how LSP works; the meaning is, even if it was conceived for playing, there are many scientific assumptions which make possible a “serious play”. This paragraph is devoted to give an idea of LSP, in order to understand why it worked as methodological inspiration for “LEGO sessions” used in LV@USI-SUPSI.

The importance of playing and gaming during childhood to develop our human being capabilities is well-known, and there is no doubt that such activities – also when done throughout LEGO – are more than serious and can have a major role in learning (Botturi & Loh, 2009). For a more in-depth analysis, the *fil rouge* linking the work of Jean Jacques Rosseau, to Maria Montessori’s pedagogy, passing through Jerome Bruner’s reflections, should be explored(Bruner, 1981). Of course, keeping in mind the *homo ludens* (Huizinga, 1938)

So, the “seriousness” we are talking about has to be understood in terms of “serious context”. Indeed, LSP was invented to implement “collaboration of scientists, researchers, business consultant, and practice managers, dedicated to improve business performance” (Roos & Victor, 2002; Botturi & Loh, 2009; LEGO SERIOUS PLAY, 2010a).

The main goal of an LSP session is to train businessmen to deal with complex organizational issues (LEGO SERIOUS PLAY, 2010c). It is important to underline that an LSP session takes place, normally, out of the organization, it lasts some days, and it aims to create a metaphorical landscape of the organization in which every artefact can represent a resource, a menace, or a chance. The key process leading such an activity is to develop an aware identity of the organization.

According to the procedure description provided by LEGO staff, it is possible to say that: every person involved in the LSP session is asked to *construct* artefacts with LEGO bricks, then to *give* a *meaning* to their buildings, and finally to share the meanings *making* a *story*.

In such a context, according to the LEGO "promise", *commitment*, *confidence*, and *insight* are expected to pop up, likewise in a toaster-machine.

One could ask what makes LSP so efficient, all in all it is just a game. A good answer is offered by TrivioQuadrivio (an Italian consultants' agency using LSP with many companies): "when the task to represent problems is executed by hands, the mind is free to cope with them much better"(TrivioQuadrivio, 2009), since most of the effort has already been resolved.

People developing, adopting, and/or using LSP realized many theoretical assumptions and it is possible to find a significant number of books explaining and showing the theory behind playing seriously with plastic bricks. One of the most engaged authors in this field is Gauntlett:

> [instead of asking to external consultants how to deal with complex issues, LSP] begins with the notion that the answers are "already in the room". Every participant gets an equal opportunity to express their feelings on ideas, and the collaborative process means that – as long as the session is facilitated properly – individual contributions will be embraced within the broader overall vision which emerges during the consultancy process.
>
> LEGO Serious Play is based around a set of core ideas: constructionism (and being "in flow"); play; and metaphor. [...]
>
> [this is possible, also thanks to the achieving of Piaget's claim that] intelligence grows from the interaction of the mind with the world (Gauntlett, 2007, p.130).

In the next paragraph we will go back to the crucial role of metaphor, since it explains how "LEGO sessions" work. Concerning the fundamental theoretical assumptions, LSP could not exist without the two concepts of constructionism and constructivism, presented by LEGO as following.

> Constructivism – a theory of knowledge developed by Jean Piaget, his colleagues, and his institute in Geneva, Switzerland.
>
> Constructionism – a theory of learning developed by Seymour Papert and his colleagues at MIT in Cambridge, Massachusetts (Roos & Victor, 2002, p.8).

In order to get a deeper understanding of the two above concepts, it is useful to define them. *Constructivism* is the process through learners construct their own unique systems of knowing, in consequence of which the teacher should focus on their internal construction (Piaget, 1973). *Constructionism* expands the above in physical terms: the role of teacher is helping learners to "build" theirs constructs, throughout the practice of "learning-by-doing". Indeed, he views the world as being understood through constructs - or internal models. And there is a double level of a construction: the elements themselves and the connections between them. So, construction means adding new elements or making new connections (Papert, 1991).

Papert's work builds upon Piaget's ideas, though it is remarkable the keyconcept of "concrete thinking" elaborated by the American scientist. It refers to the ability of thinking – and produce meanings – with and through the adoption of concrete objects; in the case of LSP it is legitimate to claim that this methodology allows to "thinks with hands" (Gauntlett, 2011). In short, thanks to LEGO bricks, making becomes thinking, playing becomes giving sense, and sharing stories becomes providing collaborative solutions.

6.6.2.2.2: "LEGO session": a method to make qualitative research

The "LEGO session" methodology developed at NewMinE Lab moves from the above described experiences and assumptions, customizing such an expertise to the research in the field of human and social sciences.

In parallel, another customization of LSP methodology was done by other researchers at Università della Svizzera italiana, namely the URL –User Requirements with LEGO– project(Cantoni, *et al*., 2011).

The LEGO sessions' protocol

Almost all the methodological assumptions are very close to the LSP's ones. In particular, the following list of four aspects are the theoretical core behind a LEGO session:

- "thinking by hands";
- using metaphors and sharing stories;
- self-projecting through artefacts;
- stressing of the individual-group-individual process. About this purpose, the best number of participants seems to be 7-8.

"LEGO sessions" are customized for research in the field of human and social sciences.

Being a methodological novelty, it is necessary to report that professor Karen O'Reilly (Loughborough University), expert of ethnographical tools and strategies, orally validated the efficiency of this method. In addition, LEGO sessions have been presented, within the ethnographers' community at the EPIC (Ethnographic Praxis in Industry Conference) conference, in Chicago (Rapetti, *et al.*, 2009). In the following picture and the subsequent text, how a LEGO session works is described step by step.

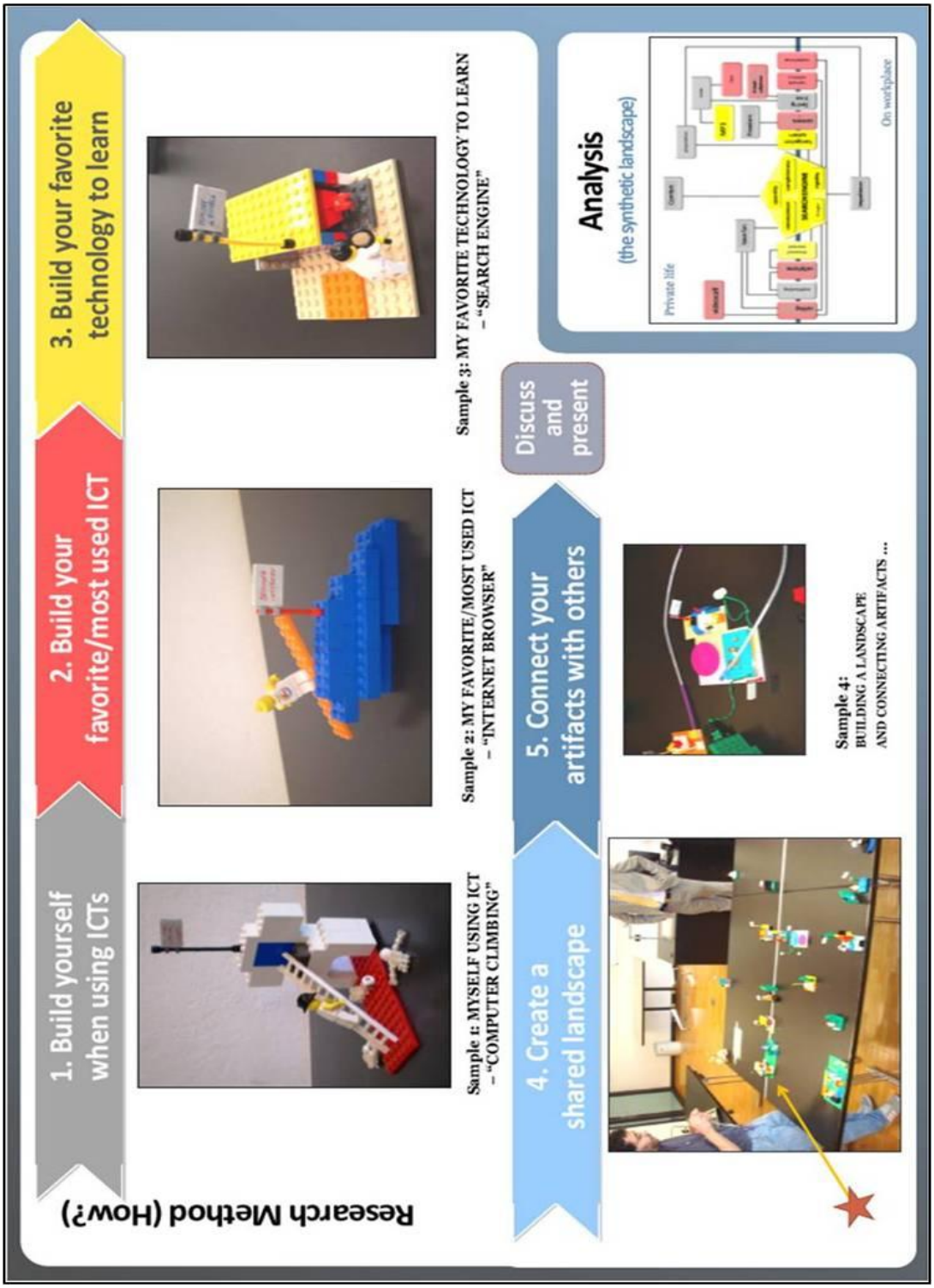


Fig. 42: synthetic description of how a LEGO session works
(Elaboration from: Rapetti, *et al.*, 2009)

A LEGO session takes place in a room, where participants – minimum 6, maximum 10 – play with bricks around a table.

A LEGO session requires:

- a room;
- a chair for each participant;
- a table, to build artefacts;
- another table, to place artefacts;
- LEGO bricks.

A LEGO session can also benefit from:

- a video-beamer, if you need to clarify concepts and steps;
- some background music, to create a relaxed atmosphere.

Participants are guided in the activities by a facilitator, who has one (or more) assistant in charge of taking pictures of the artefacts.

The session consists of seven phases.

The first four phases are played individually, every participant builds his/her artefact, and then shares the meaning with the group.

The last three ones are group phases, and people have to interact in order to provide a unique, final landscape comprehending all the artefacts.

The following pictures show the typical setting of a session.

Fig. 43: two typical settings of LEGO session

This is the complete list of phases:

1. Warming phase: it is meant to explain the methodology and the goals, to make people be confident each other, and to engage in serious playing and in giving meaning to artefacts. People have to create three buildings, of no purpose for the research itself, but fundamental to get into the play mood. In a growing level of metaphorization, participants are asked to:
    a. "Build the highest tower you can";
    b. "Build whatever you like, then give a meaning or tell us a story about that"
        - A variant – applicable to improve the level of creativity of the group – is "Build whatever you like, then explain us why you represented a ... [odd thing suggested by the facilitator]" (i.e.: your weeding day, a giant medusa habitat, the car of the future, the happiness, and/or whatever else able to improve the level of creativity of the group). The mediator can opt for this variant only when the group is already at ease with the playing task, otherwise the effect might be to cause sense of shame;
    c. "Build the typical nightmare professor or classmate".

    The warming phase lasts about thirty minutes.

2. First building step: "Build yourself when using ICTs. Then choose a keyword and write it on a little (black) flag, then, tell us your story".

    The second phase lasts about five minutes to work on the LEGO and ten minutes for the debriefing (of course, it depends on the number of participants).

3. Second building step: "Build your favourite/most used ICTs. Then choose a keyword and write it on a little (red) flag, then, tell us your story".

    The third phase lasts about four minutes to build and eight minutes for the debriefing.

4. Third building step: "Build your favourite technology to learn. Then choose a keyword and write it on a little (yellow) flag, then, tell us your story".

The fourth phase lasts about six minutes to build and twelve minutes for the debriefing.

5. The shared landscape: “Put your three artefacts on an empty table, which is split in two areas ‘leisure’ and ‘learning’, choosing where to put your buildings”.

   Putting buildings down on the shared landscape lasts less than five minutes.

6. Connections: “Connect one of your artefacts to another one made by someone else, which is relevant for your experience as a learner”. In case there are many participants (so, many artefacts), it is possible to add a second connection.

   The connection phase lasts less than five minutes.

7. Final group debriefing and free discussion: “Check all together if all the artefacts are put in the proper place, and evaluate the level of connections. Then one of the group will offer a résumé of the whole landscape”.

   The final debriefing lasts about fifteen minutes. After that, the LEGO session in itself is finished, nevertheless people like to have a rest moment, to comment the methodology, to express their feelings or opinions, and very often to share their reasoning about the role of ICTs in their learning experiences.

In some cases, at around the fourth step it is useful to have a break, anyway a LEGO session as a whole lasts about two hours and half, on average.

Differences from LSP

If compared to LSP, the methodology used in our research is different due to three main aspects.

It is *original*. Indeed, the steps necessary for a LEGO session follow a different structure. In addition, LSP explores in details – and takes benefit from – processes related to identity, and the interactions between individuals’ identities and systemic one. In particular, LSP identified four relevant purposes in adults playing: “1. Social boding, 2. Emotional expression, 3. Cognitive development, and 4. Constructive competition (Roos

& Victor, 2002, p.4). In this protocol just the aspects of identity related to media and learning are observed.

It is *compact*, in terms of time and materials needed. Actually, a LEGO session lasts about 2 hours and half; moreover, no special packets of selected bricks are used, rather a huge quantity of pieces of any type is put on the table and everyone can take whatever brick they want.

Finally, and very relevant, LEGO sessions are deeply different respect to LSP because they are customized to research in human and social sciences. In fact, the aim is completely changed and this affects the whole process

Analyzing LEGO sessions

The analysis follows two main criteria of retrieving and interpreting data, which correspond to two different moments of analysis.

First, a LEGO session is audio-recorded and pictures are taken. The dataset is composed of all the artefacts, singularly taken, the shared landscape, and all the pieces of information explicitly expressed by participants when showing their buildings. This material is summarised in the reports. The reports account for the sequence of steps and to identify who built (or connected) what and which comments were done. This way, no relevant information is lost.

The second analytical phase of a LEGO session takes place (at least) one week later, in order to treat data with a mindset depurated from the emotional and relational influences. Actually, this is useful because the second phase is devoted to select worthwhile information and to provide an interpretation from a big corpus of qualitative data. Considering an average of 8 people per session, it means 24 artefacts, 24 keywords, 24 stories, a number of comments (which could drastically influence the participants' mood), one shared landscape split in two areas, from minimum 8 to a maximum 16 connections, from 8 to 16 single explanations, and 1 final group's explanation. Plus all the reasoning which could emerge from the closing discussion. In short, much more

information can be made available this way, rather than interviewing 8 persons; but those messages need to be decrypted/interpreted.

To narrow and focus the interpretation, the following criteria of analysis were defined:

a. Cognitive-linguistic analysis on the chosen keyword;
b. Inquire of the domains (e.g.: actions; concepts, metaphors, feelings, tools, ICTs, etc) expressed in the overall corpus of keywords;
c. Overall summary of elements;
d. Spatial analysis of elements in the landscape;
e. Analysis of the participants' reciprocal influence; this criterion works to weigh the importance of a repeated metaphor/building;
f. Comparison of artefacts on the continuum abstraction-analogy (see the following picture for a sample of that).

The above criteria come from a customization of what expressed by Gautlett (2007), with contributions from other texts about evaluation of qualitative dataset in the field of learning and new media (in particular: Bèvort & deSmedt, 1999, Wornsop, 1999; Rivoltella, 2001a; Ferrari, 2007;Ardizzone & Rivoltella, 2008)

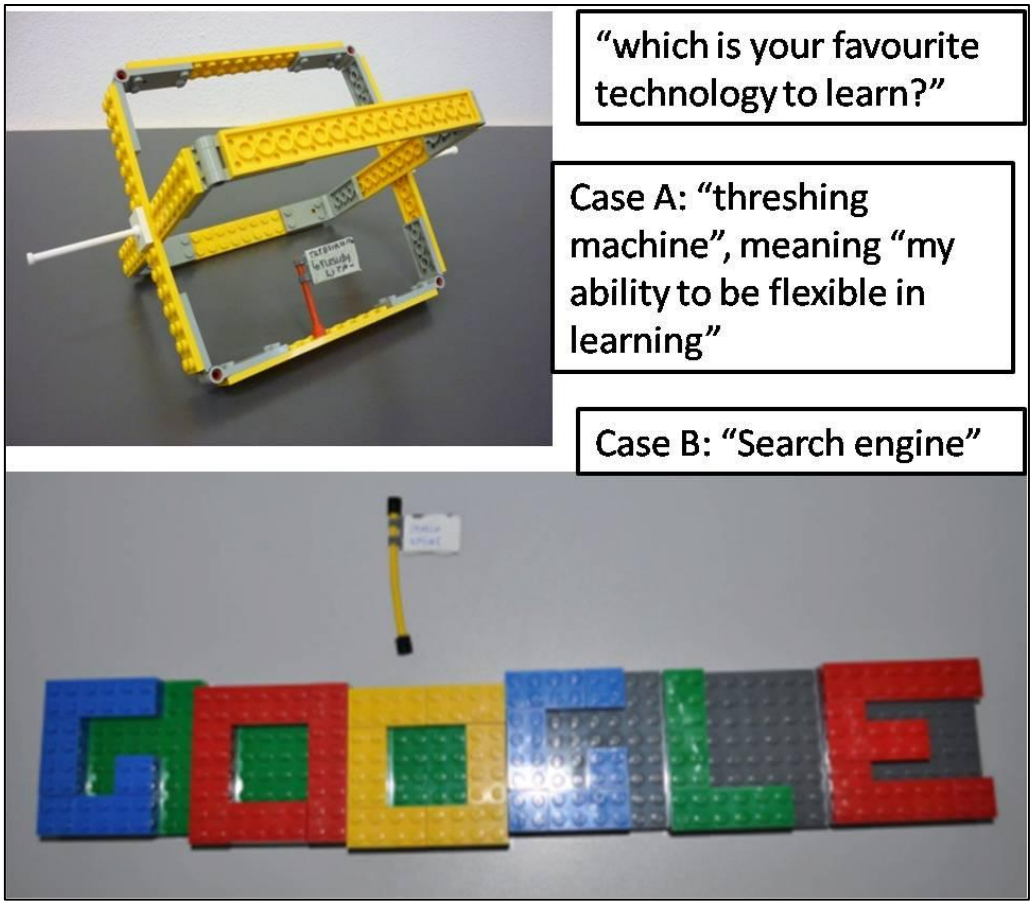


Fig. 44: samples of two extreme approaches on the continuum "abstraction-analogy"

The identity issue

Though identity issues are not the core of LEGO session methodology, some notes about this topic are worthwhile. Social sciences naturally meet open questions about identity, when exploring social experiences and inter-subjective processes of sense-giving.

Metaphorical representations and self-representations work well during LEGO sessions because they are relevant in shaping and structuring the social actions system – being social actors aware or not. Human and social scientists know that the process of identity-building (and self-projections) emerges from the interaction between self, progressions in self-awareness, culture, mind, education, and social action (Bruner, 1996). All those aspects are somehow involved during any playing moment. One likely strategy to keep track of such amount of information is – if needed – to observe creativity processes, in

order to explore the individuals' perception of their social action and identity. Many relevant steps have been done so far in setting research tools able to stress the power of visual in social sciences (Rose, 2007), from instructional design (Botturi & Stubbs, 2008) to ethnography (Ulk, 2008). On the other hand, discussing of "identities and visual" can make the topic short-lived or difficult to translate in terms of results because of the limits due to individuals' perception (Purves, 2010). Anyone experienced such limits – for instance – when looking at optical illusions.

As if to say, using the power of visual is at the same time a strength and a weakness; images, artefacts, buildings, collages, and similar are powerful because they allow to explore deeper; as well as they are limited, since they inform specifically about individuals. Keeping the above in mind is fundamental when setting a research which aims to collect scientific information analyzing metaphors built via plastic bricks.

The power of metaphors

The following quotation is important to frame the experience of serious playing implied by LSP, as well as by LEGO sessions:

> It is argued that play is good for social bonding, as players have to collaborate and communicate; that it engages the emotions within a contained zone, where particular issues can be worked through; and that it fosters understanding between participants (Plato is supposed to have asserted that 'You can learn more about a person in an hour of play than in a year of conversation'). Finally, the idea of 'constructive competition' is not that anyone is concerned about 'winning', but rather that participants are encouraged to do their best when they can see that others are doing so (Gauntlett, 2007, p.134).

It is necessary to pinpoint that any activity of (serious) playing receives such importance and it is so effective because of the power of metaphors.

6.7: Overview on the qualitative dataset as whole

6.7.1: Qualitative materials to deal with open questions

In this paragraph an overview on the qualitative dataset will be presented – namely: media diet diaries and LEGO sessions. Anyway, the complete dataset is offered in the annexes (see section 9.3, p.422).

This part is considered strategic to comprehend how – from the qualitative dataset – it is possible to draw answers to the four open questions presented in 6.4.2.

Since the qualitative part was meant to elicit discussions and reflections, there are two origins for the qualitative dataset. The first one is composed by the reports written contextually with the media diet diaries and the LEGO sessions. The second one is the collection of notes taken by the researcher and transcriptions of class discussions, commenting the media diet diaries, or during the LEGO sessions. When it is necessary to emphasize such a distinction in the text, the transcriptions of discussions are marked with (T), and material coming from the reports are identifiable by a (R).

6.7.1.1: Data from 3 media diet diaries

As said in the methodological chapter, diaries were compiled by eLearning course students. The class was composed by about 25 students participating regularly to lessons. Researchers asked to the class to split in two groups: the first group had the task to describe in details a typical daily media diet of two LoDE; the second one had to figure out which is the impact on learning behaviours of experiences with digital devices, on a weekly base. Three persons were the studied subjects, while the classmates had the role of observers, and the latter were asked to provide written reports. The choice was to use easy tools, especially aiming to elicit a fruitful discussion with participants and observers: the first group adopted a grid of analysis/description of the daily usages of digital technologies, and the second one decided to show student's life with digital devices through a diaporama/slideshow of significant pictures.

6.7.1.1.1: Daily media diet diaries

The tables below show an excerpt from the analytical schemas of the first hour of the daily diaries compiled by R.A. (female, 21 years old) and E.P.(male, 22 years old). The two extracts are useful to have an idea of the tool, and of the application by participants. Tables in sections 9.3.1.1 and 9.3.1.2 present the whole dataset of daily media diet diaries.

The language in the table is Italian; columns describe, in order, at what time the technology was used, which technology, which function, and a brief description of usage. Participants noted any technologies they faced, this point will be discussed in details later on. Records related to learning are highlighted in yellow, while those highlighted in orange are the cases in which the ICTs were used with leisure purposes but the tool would allow also a learning-related usage.

Tab. 16: miss R.A. daily media diet diary – first hour

Ora	Tecnologia	Funzione	Uso
7.30	Cellulare	Funzione sveglia	Il cellulare fa un suono che funziona come sveglia
8.00	Teiera elettronica	Alimentazione	Scaldo l'acqua per farmi una tazza di te
8.15	Spazzolino elettrico	Igiene	Lavare i denti con lo spazzolino che si muove da solo
8.19	iPod	Funzione musica	Uso l'IPod per ascoltare musica mentre cammino verso l'università
8.20	Orologio	Indicazione del tempo	Controllo il tempo sul mio orologio da polso
8.21	Ascensore	Trasporto	Il bottone dell'ascensore è acceso; vuol dire che è occupato. Una volta spento, chiamo l'ascensore schiacciando sul bottone
8.22	Ascensore	Trasporto	Scendo 6 piani con l'ascensore che mi indica su che piano mi trovo in qualsiasi momento
8.25	Semaforo	Comunicazione	Schiaccio il bottone del semaforo , il quale quindi diventa"verde"
8.30	Computer portatile	Applicazione di creazione di testi	Uso Word per prendere appunti durante la lezione

Tab. 17: mister E.P. daily media diet diary– first hour

Ora	Tecnologia	Funzione	Uso
8:00	Sveglia	Sveglia	Sveglia della radio con puntatore laser dell'orario sul soffitto.
8:05	Macchina da caffè	Alimentazione	Attesa che il led colorato lampeggi per segnalarmi che l'acqua ha raggiunto la temperatura richiesta per un caffè espresso.
8:10	Rasoio elettrico	Igiene	Il rasoio indica con un led di colore rosso che è acceso e pronto radere.
8:15	Computer	E-mail	Dopo aver visto la lampadina luminosa che indica che il mio MacBook è ancora in standby, apro Safari e controllo le mie caselle e-mail cui evito di rispondere per problemi di tempo.
8:15	IPhone	Aggiornamento	Stacco il cellulare dalla carica e controllo eventuali messaggi o chiamate.
8:25	IPhone	Musica	Pronto per uscire entro nell'Ipod del mio IPhone e seleziono una canzone.
8:26	Ascensore	Trasporto	Schiaccio il bottone per la chiamata dell'ascensore, il quale si illumina di giallo.
8:26	Ascensore	Trasporto	Entro nell'ascensore e schiaccio il pulsante del piano desiderato (piano terra). Si può vedere l'indicazione di ogni piano che man mano si scende si illumina di rosso.
8:27	Luci	Illuminazione	Una fotocellula rileva il mio passaggio dall'uscita posteriore della casa che causa l'accensione delle luci al pian terreno e al cortile esterno.
8:27	Contachilometri	Contare i km	Controllo la velocità della mia bicicletta .
8:27	Indicazione luminosa	Informativa Pubblicistica	Leggo involontariamente l'indicazione luminosa sotto al cartello di una farmacia (temperatura/data/ora).
8:28	Semaforo	Regolamentare il traffic	Schiaccio il bottone per velocizzare i tempi di attesa del segnale verde per attraversare la strada.
8:29	Porta scorrevole	Entrata	Una fotocellula rileva il mio passaggio e apre la porta principale del palazzo bianco dell'università.
8:29	Porta scorrevole	Uscita	Una fotocellula rileva il mio passaggio e apre la porta secondaria del palazzo bianco dell'università.
8:30	Cellulare	Togliere le suonerie	Dopo aver spento la musica, mi assicuro che il mio iPhone sia impostato su silenzioso.
8:30	Proiettore video	Supporto lezione	Vedo le slides delle lezioni proiettate sul muro.

In order to move from gross data to relevant outputs, the following tables are offered.

Tab. 18: miss R.A. daily media diet synthesis

How many uses of technologies in a day?	36
Day-time with technologies	From 7:30 to 21:00
How often a technology enters the life of the student? (mean)	About every 22 minutes
How many usages learning-oriented?	6
How many usages leisure-oriented via ICTs allowing learning usages?	14

Tab. 19: mister E.P.. daily media diet synthesis

How many uses of technologies in a day?	79 (of which 19 related to car use)
Day-time with technologies	From 8:00 to 23:40
How often a technology enters the life of the student? (mean)	About every 11 minutes
How many usages learning-oriented?	7
How many usages leisure-oriented via ICTs allowing learning usages?	16

As the tables show clearly, even if the permeation of technologies is unquestionable in the life of the two participants, ICTs used in learning are just a little part of the total. Leisure-related usages are more than twice as important than learning.

The next figure offers a direct comparison. It emerges that, concerning the total of usages, the male is more technology oriented, but also that they are very close in the use of ICTs for learning.

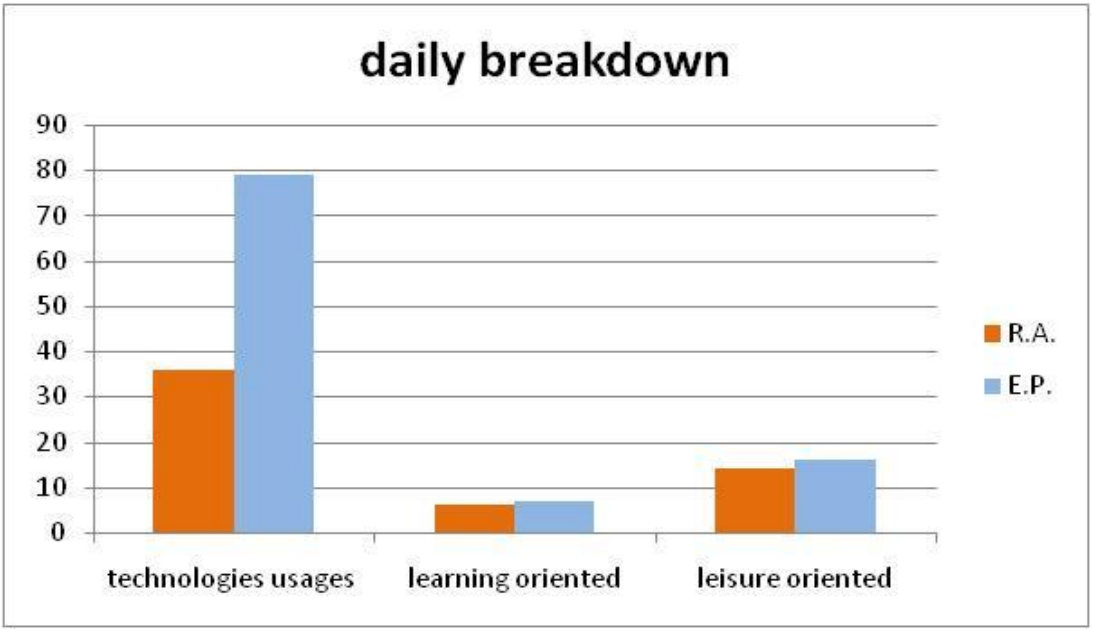


Fig. 45: comparison of daily breakdown by the two participants

Remarkably, a predisposition to an exploitation of digital technologies for learning purposes emerges: the male declared to use his I-Phone to audiotape the class lesson.

6.7.1.1.2: Weekly media diet diary

The observation of the weekly media diet was focused to observe which digital technologies are predominant in LoDE' s life. The person observed – S.M., female, 21 years old) – reported how many times per week certain ICTs were used, then pictures of the most recurring usages were taken. The overall slideshow presented by students who were observers is shown in figure 46. As pointed out in chapters 2 and 4, the object of such an investigation is multifaceted, involving aspects which can be counted (analysis) and aspects which need to be faced through iconic and symbolic (synthesis) approaches; this is why researchers identified the slideshow as valid to describe iconically the impact of ICTs (see, for example, EDUCAUSE, 2011).

Fig. 46: miss S.M. weekly media diet overall slideshow

As also self-reported by the student observed, her media diet is, somehow, unbalanced, since “there is a very massive use of a just a little number of ICTs, if compared to all the existing ones”. She is a great user of internet and cellphone.

The five technologies she reported to have a significant role in her week are, in order of importance: computer connected to the internet, cellphone, TV, IPod, and video beamer. The section 9.3.2 in the annexes describes in detail her prevalent usages during a week.

To summarise her weekly media diet, the computer is the most used ICT, specifically the internet has been used for learning purposes, for the social networking, and for

programmes for synchronous communication (skype, msn, chat). The phone, as well, has been used for the latter purpose. The IPod is used as music player and as a study support (listening to podcasts). The television has had a dual use: information (news) and entertainment.

Again, as discussed above, the student uses the Internet more than television. This is because the Internet can be used to integrate other technologies, including television and telephone.

Interestingly, the radio apparatus is no longer used, its functions has been replaced by IPod or computer.

As noticed by students "the disproportionate use of some technologies, like internet, is due to the fact that they include others. Generally, the means used for entertainment and information are the same, even for the fact that the distinction between entertainment and communication is not always clear". A statement which, again, comes back to the concept of media convergence.

6.7.1.2: Data from 2 LEGO sessions

As said in par.6.6.2, LEGO session methodology is highly demanding in terms of time and availability of people. This is its main constraint. Because of that, the original idea – to have one LEGO session at USI, and another one at SUPSI – was abandoned. Nevertheless, it was possible to organize two LEGO sessions; the first session involved 8 students from the faculty of USI-COM, and the second one involved 11 students from the faculty of USI-INFO. Such a breakdown is interesting and useful for the dissertation because of the difference of the two faculties: USI-COM more social/humanistic-oriented, and USI-INFO more scientific-oriented.

In this paragraph, the reader can find two reports showing which artefacts were built, the attributed keywords, and comments. The original language of comments have been kept.

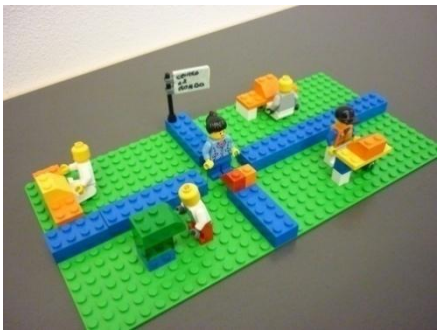
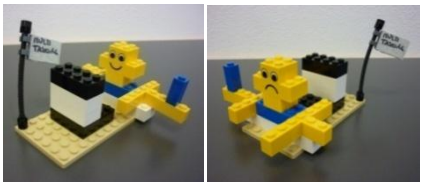
For the description in detail of the LEGO session protocol, see par. 6.6.2.1.

6.7.1.2.1: LEGO session @ communication sciences

This LEGO session followed exactly the protocol in each of its phases. The following three tables show a sample of all the produced artefacts; two pictures present the final appearance of the common landscape, in reality and in its synthetic version. The whole LEGO sessions' dataset is available in section 6.7.1.2 of the annexes.

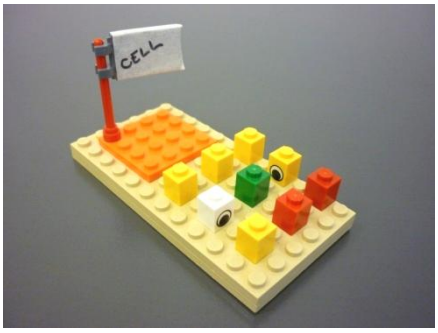
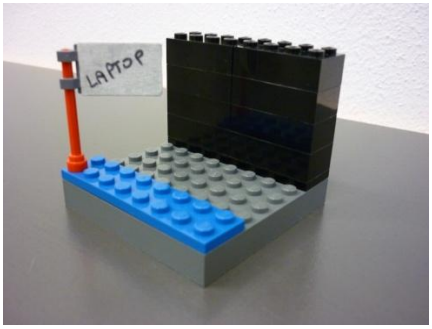
Tab. 20: LEGO session @ communication sciences –sample of 1st step

Build yourself using ICTs (language: Italian)

KEYWORD	ARTIFACT	COMMENT
Il centro del mondo (the centre of the world)		Posso comunicare con tutte le persone del mondo trovandomi nella mia stanza. Ci sono cinque posti diversi e un'unica cosa in comune sono i computer. Io nel mio mondo sono al centro e di conseguenza anche gli altri quattro nel loro mondo sono al centro.
Multitasking (fast-switching)		Quando uso il computer ho la sensazione di fare tante cose assieme (anche se non ho la certezza che le faccio al meglio), ma in realtà faccio un fast – switching (le faccio velocemente ma comunque in modo separato). Ho la sensazione di felicità quando le faccio assieme, ma quando non riesco a finirle tutte sono infelice.

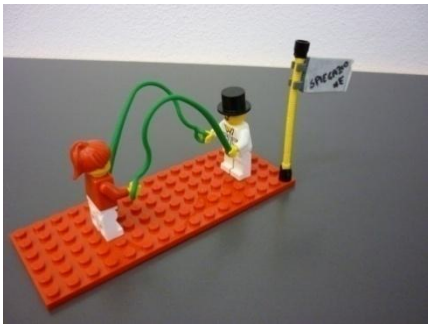
Tab. 21: LEGO session @ communication sciences – sample of 2nd step

Build your favourite/most used ICTs (language: Italian)

KEYWORD	ARTIFACT	COMMENT
Cellulare (cellphone)		Si usa il cellulare come sveglia, per inviare sms e telefonare. Senza il cellulare si ha la sensazione di aver perso qualcosa e la paura che qualcuno ti possa cercare nel momento in cui non ti può raggiungere. Il cellulare serve da *connection*.
Laptop		Si può fare tutto con il laptop: musica, video, immagini, ricerche, telefonate, e-mail, compiti, ecc…

Tab. 22: LEGO session @ communication sciences – sample of 3rd step

Build your favourite technology to learn (language: Italian)

KEYWORD	ARTIFACT	COMMENT
Libro (book)		Si può interagire con il libro, prendere appunti, raccontare la storia ad un amico, tornare a una pagina quando si vuole. Il libro è come un insegnante portatile e personale
Spiegazione (oral explanation)		C'è uno scambio di informazioni, uno ha le informazioni e l'altro le chiede

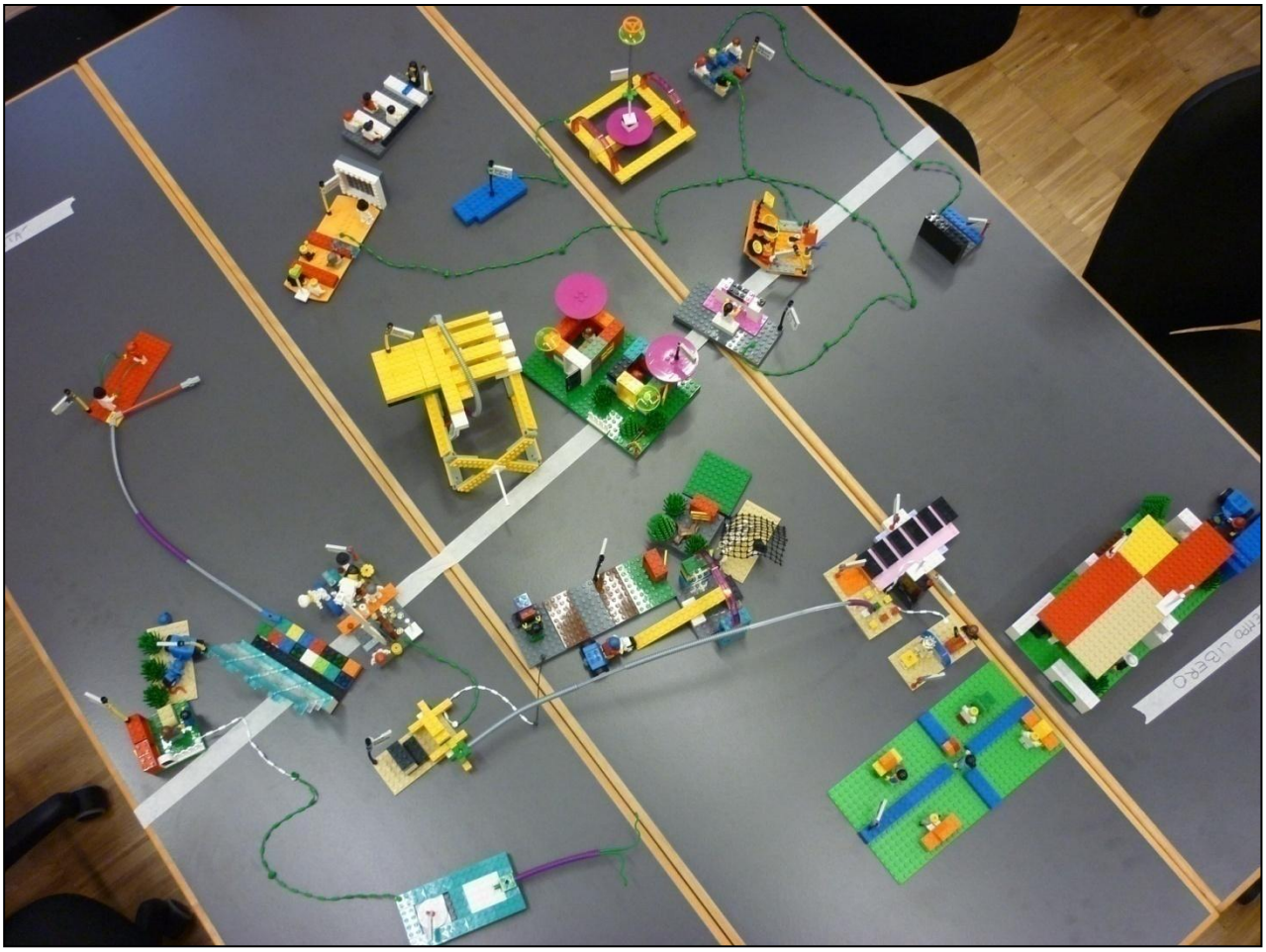


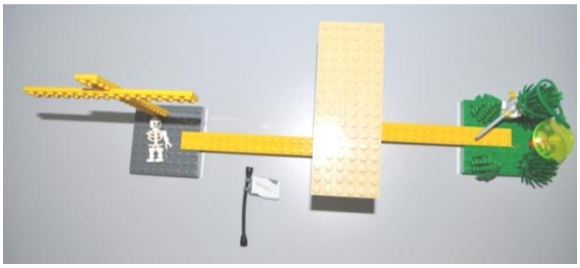
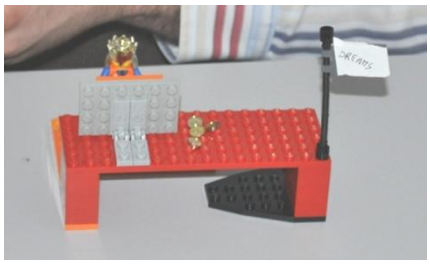
Fig. 47: LEGO session @ communication sciences – 4thand 5thsteps
share your creations on a common landscape – split between "learning" and "leisure";
then connect the two most relevant artefacts for you

6.7.1.2.2: LEGO session @ informatics

Due to contextual constraints, LEGO session @ informatics was set in a slightly different way. In facts, the number of participants was greater than expected (11 people). So, due to limitations of time, only the first and the second step of producing artefacts took place; but the final amount of LEGO buildings was significant and consistent for our research.

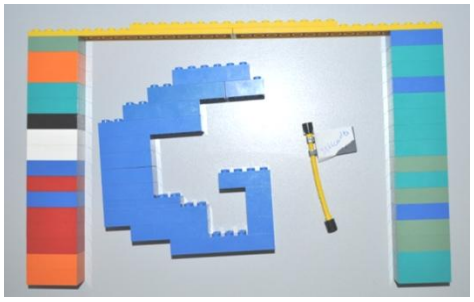
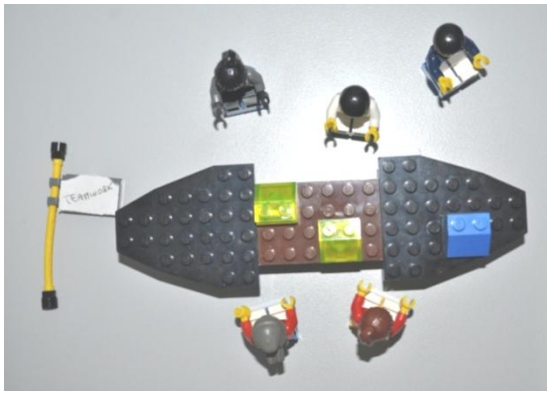
Tab. 23:LEGO session @ informatics – sample of 1st step

Build yourself using ICTs (language: English)

KEYWORD	ARTIFACT	COMMENT
Slavery		Me, using ICTs? It's slavery! Everything is asked to me, I have to provide... it doesn't mind where and when. The skeleton is me.
Dreams		I decided to study informatics to make my dreams come true. This is me, with my laptop, my ideas, and – hopefully – a lot of money.

Tab. 24:LEGO session @ informatics –sample of 3rd step

Build your favourite technology to learn (language: English)

KEYWORD	ARTIFACT	COMMENT
Searching		Google is the faster way to gather whatever information I need.
Team work		Working together with other people is enriching. Around the table many and different ideas arise. You learn from others' points of view.

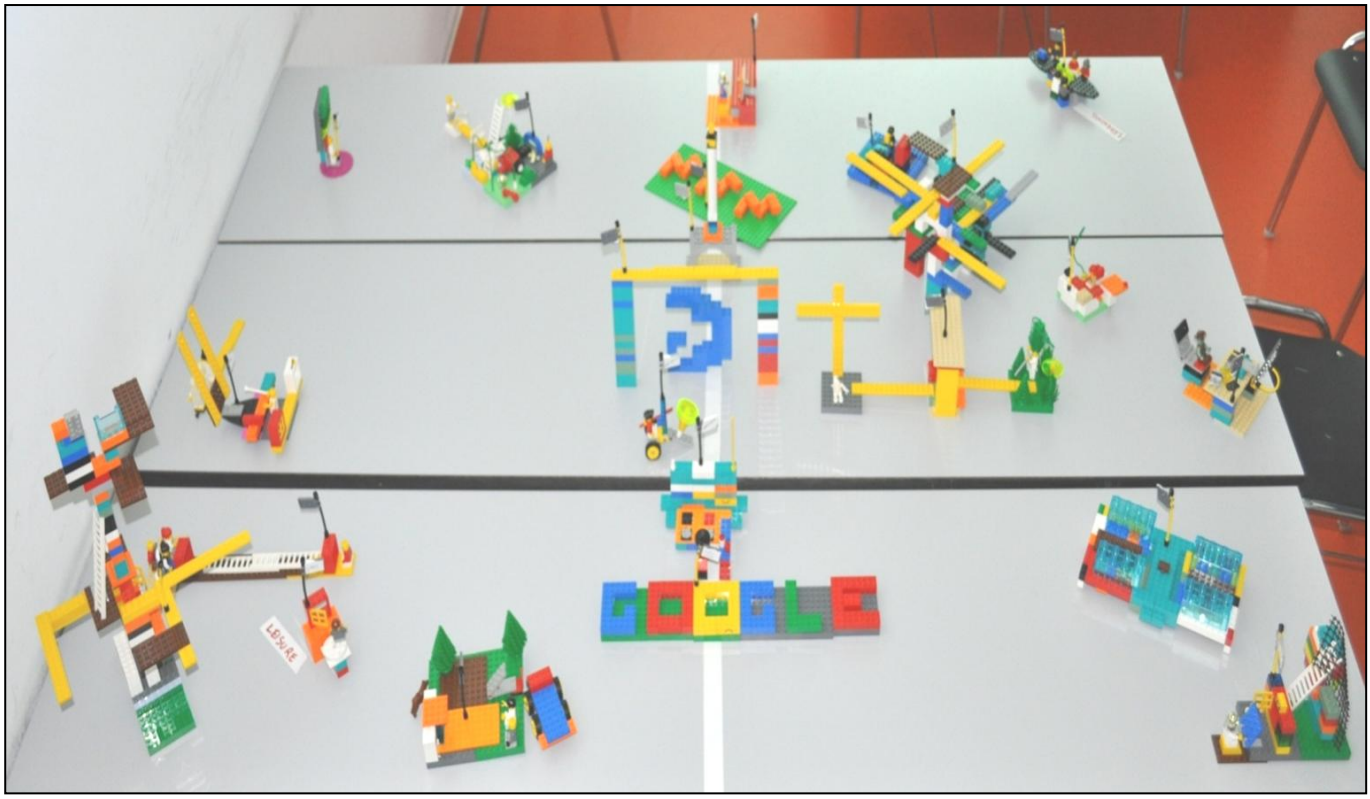


Fig. 48: LEGO session @ informatics – 4thstep
share your creations on a common landscape – split between "learning" and "leisure"

6.8: Potential biases

Indicating the critical points of the methodological architecture is a due step of intellectual honesty. The following text tries to put in evidence what emerged, both *in itinere* and *a posteriori*, to be potential biases of LV@USI-SUPSI.

Context bias

Ticino is for sure an interesting setting for a research in human and social sciences; nevertheless, it is also "a world apart". For many socio-economic-cultural aspects it is closer to Italy than Switzerland (e.g.: language), though for many others it is surely Swiss. A point to be put in light before approaching outcomes and results; as if to say that our results are generalisable but keeping in mind that students in Ticino are at the crossing point of France, Germany, and Italy (not only geographically speaking).

It has also to be reminded that USI and SUPSI have been chosen also for opportunistic reasons. This is a deepening of the previous point; and it pushes to enlarge the target of analysis.

Threat to external validity in the sampling:

As said in 6.5.1, the random self-selecting sample might be a condition that limits our ability to generalise the results of our experiment to practice.

Participants' bias:

LoDE engaged in LV@USI-SUPSI are all people already engaged in ICTs' usages.

Imperfections in the questionnaire:

The questionnaire was still too long: among the 562 questionnaires kept as valid, some questions registered almost 30 dropouts; even if the final version needed slightly more than 25 min to be completed.

One of the aimed goals was to identify clusters, in order to offer and discuss profiles of learners: unfortunately questions were not enough differentiating or, our population did not expressed a significant variance in behaviours, despite the variance in socio-demographics.

Limits of quasi-ethnographical research methods

They depend on the scepticism due to results which can not be generalised. Especially, two aspects need to be mentioned.

Contents of media diet diaries: we decided to narrow the data to be filled into diaries, only including the actions related to digital media. This has been helpful but didn't provide enough information in terms of interactions among different tools and didn't offer an actual view on the inner complexity of media diets. On the other side, in the works that observed all the media it is very difficult to identify each specific medium – e.g.: how watching a movie on YouTube can be categorized? (see: Vahlberg, 2010).

With the qualitative sampling researchers aimed to get the biggest possible variance within the population, of course as this phase is really time-consuming, it was not always

possible to obtain what expected. The most critical issue around this point is the fact that SUPSI students were not involved in the LEGO sessions.

6.9: Methodology synthetic overview

In conclusion, this chapter focused on different methodological issues according to the following schema, meant to resume the whole research protocol. The second column stresses a keyword of the observation process, while the third one explains what the keyword means according to the theory of methodology in human and social sciences.

Tab. 25: methodology synthetic overview

Par.	Contents	Observing...
6.1	The research background	...thanks to
6.2	The research context	...where
6.3	The research framework	...within
6.4	The research architecture and consequent objects	...what
6.5.1	The research subjects	...whom
(6.4) 6.5.2	The research strategy	...how
6.6 6.7	The research tools	...through
6.8	The research biases	...in spite of

Any investigation in human and social sciences constitutes just a step in a knowledge endless process. As LV@USI-SUPSI needed background data and methodology coming from other researches and a solid framework, our hope is that our work can become the informing material and the starting point for the future; since

> the research process can be conveniently understood like a circle,
> [...and from the circularity gives off the research repetition;] this

situation is mainly due to the fact that the next researcher usually finds aspects which [can be considered somehow lacking or weak] in the previous study and s/he wants to improve it rather than simply repeat it (Bailey, 1995, pp.28-29).

Chapter 7: Learners' Voices results

Chapter seven shows results of LV@USI-SUPSI, and it is organized in four paragraph.

The first paragraph is devoted to present personal details of participants.

The second one offers quantitative results, namely the statistical treatment of questionnaires data, in order to verify/falsify the seven hypotheses already discussed (in.6.4.1) The seven hypotheses are: (i) the presence of ICTs in LoDE experience is massive; (ii) ICTs' usages are more related to leisure purposes than to learning ones; (iii) ICTs' adoption for learning goals is statistically relevant for elementary learning behaviours; (iv) ICTs predilection in learning contexts is explainable/predictable thanks to age variable, country of origin, gender, field of studies; (v) LoDE request for more ICTs in formal learning; (vi) eLearning is the preferred way to learn; (vii) and LoDE express a learning-style pattern that is digitally oriented.

Paragraph 7.3 discusses qualitative results, namely the analysis of data coming from media diet diaries and LEGO sessions. Such a complex dataset is meant to offer answers to the four open questions (detailed in 6.4.2). They are: (i) which is the perception LoDE have of their media diet, and how does it influence learning behaviours?; (ii) which is the relevance of digital experiences for learning?; (iii) is it observable a skill transfer from informal contexts of learning to formal ones?; (iv) are LoDE bearer of a peculiar technological potential, useful for learning purposes?

The closing paragraph is devoted to explain how to merge data coming from different methodological approaches in order to obtain a solid and sound corpus of information about learners and new media.

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- Rapetti, E. & Cantoni, L. (2010b). Exploring the added value of digital technologies and eLearning in higher education from learners' perspective. A research informed by a systematized literature review. In *Edu-Learn 2010 Conference Proceedings* (pp. 1403-1412). Barcelona, Spain.
- Rapetti, E., Ciannamea, S., Cantoni, L. & Tardini, S. (2010). The voice of learners to understand ICTs usages in learning experiences: A quanti-qualitative research project in Ticino (Switzerland). *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010* (pp.2527-2536). Toronto, Canada.

7.1: Personal details of participants

7.1.1: Age

Average age is 24.5 years, while the median, which divides the sample into two equal portions, is 23 years. Concerning the two values, the standard deviation is approximated to 5,85.The age ranges from a minimum of 17 years to a maximum of 75 years. Though, even not considering the three extreme cases/outliers (i.e.: 17, 50, 75 years old), the mean does not change significantly (24.3); then, in order to boost the variance within the sample, the three cases have been kept.

Despite half of students in the sample being located between 21 and 26 years, age was divided into three age groups: 17 to 23 years (58,5% of the sample), 24 to 29 (28,1%), and 30 and over (13,3%). This is primarily aimed to highlight any possible differences between LoDE who are said to belong to Gen Y – namely, the ones born after 1980 - and the others, who in 2009were over30. Secondly, it was valuable to make a further comparison within the Gen Y itself, between those who are at the beginning of this generation and the younger ones, presumably more digitized. As we will see, this division puts in evidence many interesting demographic data (e.g.: crosstabulating age classes with preferred learning strategy, paragraph 7.2.4).

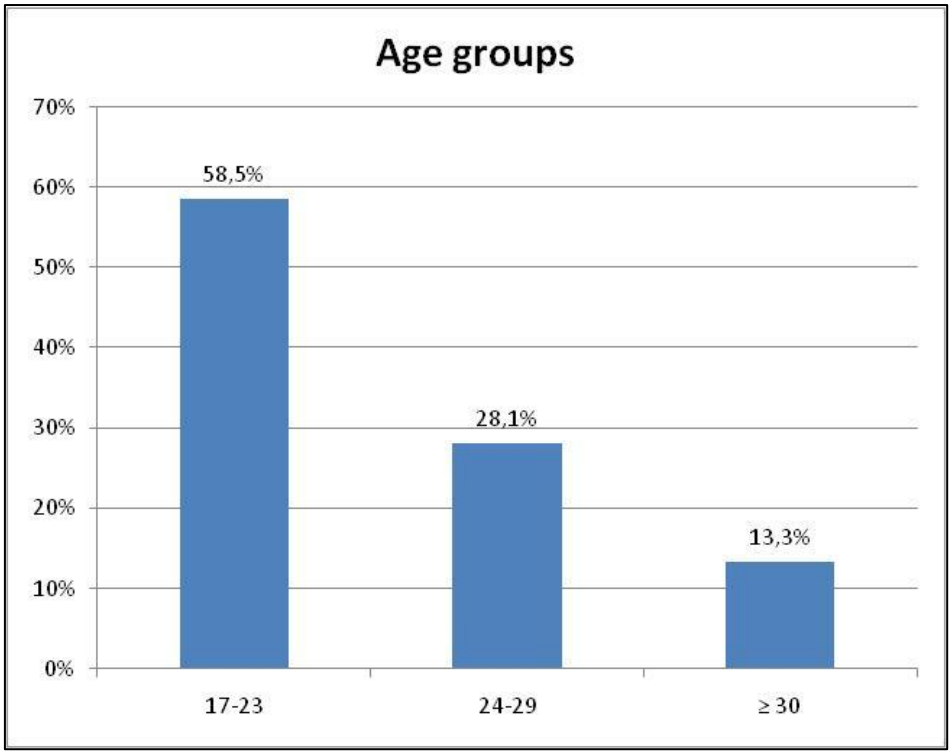


Fig. 49: sample split in three age groups (q.2.1 elaborated) - total 562; data expressed in %

7.1.2: Gender

Concerning gender of participants, 318 (56,5%) are female and 244 (43,4%) are male. The most represented group is composed of17-23 years old female students.

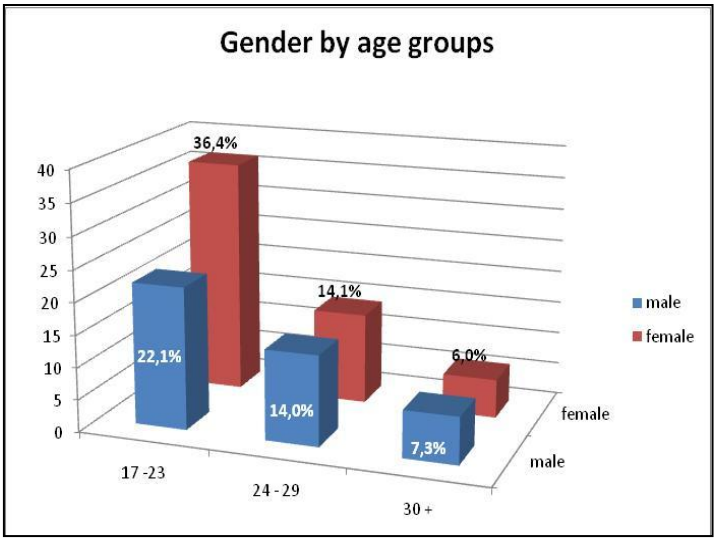


Fig. 50: gender of participants filtered by age groups (q.2.4 * 2.3 elaborated) - total 562; data expressed in %

7.1.3.: Faculties (USI) and Departments (SUPSI) attended

Among the respondents, 56,6% of students attended SUPSI and 45,4% USI, respectively 307 and 255 people (in the annexes, section9.4.2.1showsthe repartition by faculties and departments of the original population).

About one third (32,0%) of participants to LV@USI-SUPSI, in 2009, were enrolled at the first year, and there is overall majority of people attending bachelor courses (75,1% of total). The following figure describes the participation by years of enrolment, in frequencies.

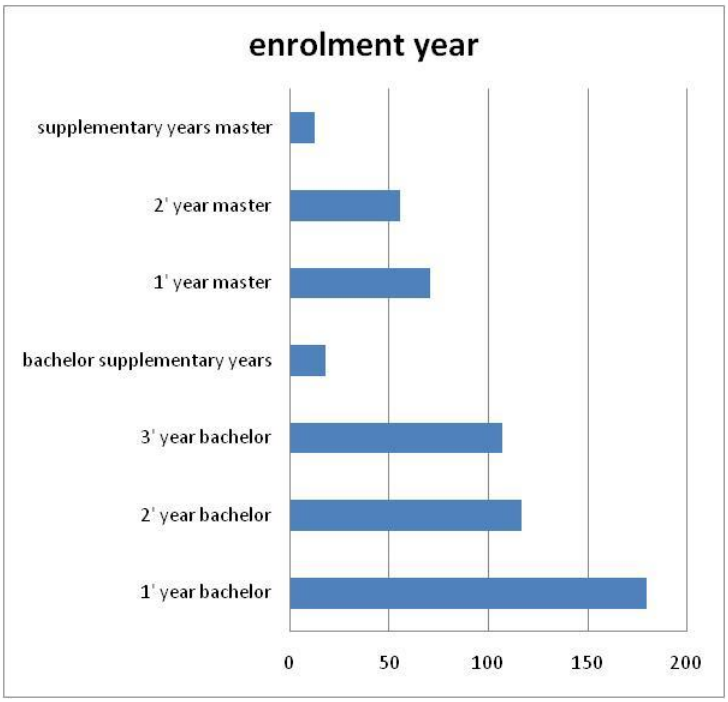


Fig. 51: participants by enrolment years
(q.2.5) - total 562; data expressed in frequencies

Concerning the detailed repartition in faculties and departments, the two biggest groups were students of USI-COM (25,6%) and SUPSI-DSAS (24,6%). A limitation of the data is that for the Faculty of Architecture and the Department of Formation and Learning (emphasized in black font in the following figure) it was not possible to go over the 5%, arbitrary considered as the minimum threshold of security; therefore no specific reasoning will be offered for those two entities.

The following picture specifies the repartition. The complete explanation of faculties' and departments' acronyms is presented in paragraph 6.5.1, pp. 212-213.

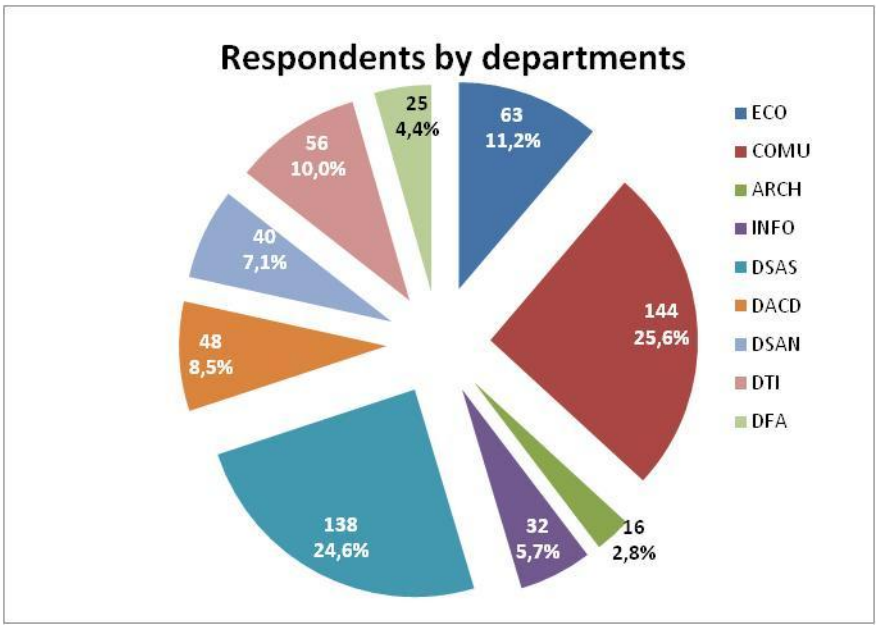


Fig. 52: respondents presented by departments (q.2.6 elaborated) - total 562; data expressed in %

7.1.4: Country of origin

Finally, the last socio-demographic aspect considered in this research is the country of origin. Both USI and SUPSI have an unquestionable international attitude, mainly due to the multilinguism of Switzerland, and the proximity to Italy. Therefore it does not surprise to find Switzerland at the first place (316 people, 56,2% of total), but a significant presence of Italian people (24,9%) and a 12,5% of people coming from the rest of Europe (grouping Germany, France, other EU countries, and other non-EU countries); participating students from Africa, Americas, and Asia all together consists 6,4%of the student sample (red-marked in the graph).

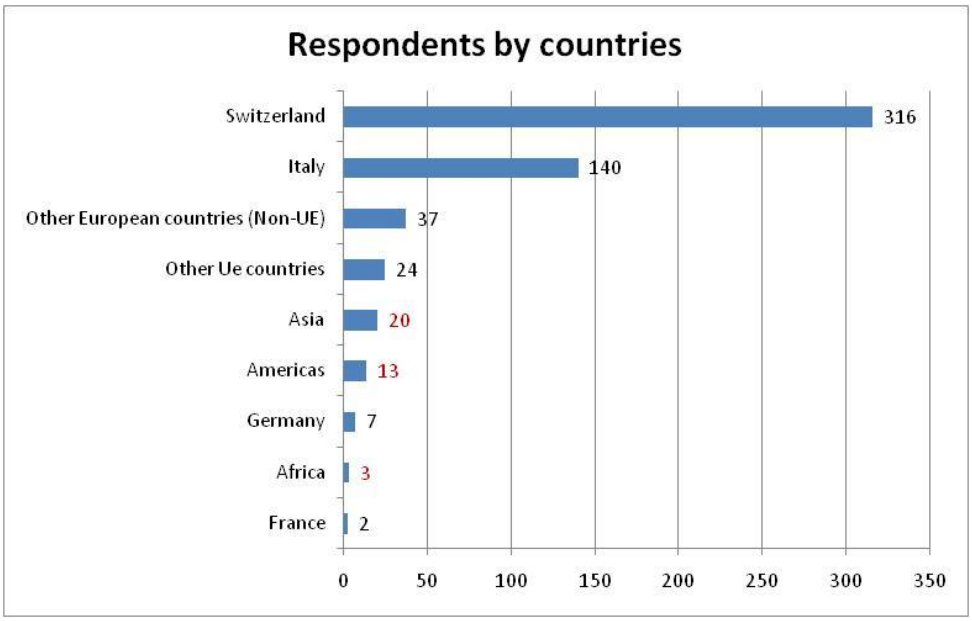


Fig. 53: respondents by countries of origin
(q.2.5) - total 562; data expressed in frequencies

7.2: Verification and falsification of hypotheses

The structure of paragraph 7.2 is modelled around the table of hypotheses discussed in the previous chapter (tab. 12, par. 6.4.1).

The following seven paragraphs present in detail each hypothesis, its indicators/measurable aspects, the issues explored, and the details of questionnaire involved in data treatment. Then, figures and tables are offered and commented. Each paragraph starts with a table presenting again the hypothesis, and ends with a resume of the specific conclusion(s). When necessary – following the statistical criterion of the maximum parsimony – the material needed to explain in details statistical procedures is offered in the annexes. All the questions asked in the online questionnaire are presented in detail before the data treatment.

Age, gender, countries, and areas of studies are specifically treated in par.7.2.4; such variables are mentioned in other parts of the text only when directly relevant for the discussed hypothesis.

7.2.1: First hypothesis: The presence of ICTs in LoDE experience is massive

The general aim of this dissertation is to verify which assumptions about LoDE can not be rejected and are meaningful, both for instructional designers and scholars interested in pedagogical/didactical transformations in higher education due ICTs.

Therefore, the first hypothesis addressed in the analysis is meant to check whether the access to digital and media diet allows to assume such assumptions.

Tab. 26: 1st hypothesis

Hypothesis	The presence of ICTs in LoDE experience is massive	
Indicators - Measurable aspects	Descriptive statistics of owned ICTs	
Issues explored	a. LoDE access to digital media	b. LoDE usage's frequency of digital media
Tool details	Questions 3.1, 3.2	Question 4.1 Comparison among questions 4.1, 4.2, 4.3

It is important to underline that, if everyone can observe how massive is the role of media in everyday life, what we are checking here is how this role can be related to learning. In other words, if the expected massive role of media in daily life is confirmed, this dissertation seeks to explore how this role can be related to learning

7.2.1.1: Details of questions to verify/falsify the hypothesis

LoDE access to digital media

Question 3.1 was meant to explore which ICTs were owned by the respondents, within the following list of 12 suggested technologies (likely to be useful in learning experiences): Desktop Computer, Laptop, Notebook, Printer, Scanner, Webcam, Digital camera, Video camera, DVD/CD burner, Tablet, Video game console, Computer organizer (e.g. i-Phone, Handheld, Blackberry, etc.).

Multiple answers were allowed, including the answer "none of these", and – if applicable – to specify others.

Question 3.2 was structured as a grid in which indicate how much (per day) a person was connected to the internet. Three possible places of connection were listed: home, university, workplace. The time of connection was split into: never, 0-30 min, 30 min - 1 hour, 1-3 hours, more than 3 hours.

LoDE usage's frequency of digital media

Question 4.1 was a very complex grid meant to explore in depth the frequency of 23 online activities which could have – somehow – a learning function exploitation. The complete list is: Downloading podcasts, Downloading music, Downloading films/videos, Downloading widgets/gadgets, Downloading games, Downloading images, Downloading software, Watching a film / listening to an audiotrack, Writing on your blog, Reading blogs, Editing your personal website, Adding comments to what you read/see or taking part in a forum, Creating/updating your profile in social networks, Tagging contents, Signing/reading RSS feeds, Reading/writing e-mails, Reading newsletters e-mail or alerts, Grading a product/service, Using search engines, Selling, Buying, Reading newspapers, Reading eBooks. These activities have been grouped in

five areas: downloading, producing contents/blogging, socio-relational use, communication/information retrieval, commercial use. It was possible to answer: every day, every 2/3 days, once per week, every 2/3 weeks, 1 time per month, never.

Question 4.2 was about the frequency of reading printed newspapers and books. It was possible to answer: every day, every 2/3 days, once per week, every 2/3 weeks, 1 time per month, never.

Question 4.3 was about the frequency of usage of "classical media" such as TV, radio, and other music media. The media diet was explored within the week and it was possible to answer: every day, every 2/3 days, once per week, every 2/3 weeks, 1 time per month, never.

7.2.1.2: Results

LoDE access to digital media

Question 3.1's descriptive analysis substantially confirms our hypothesis. It is observable that almost 9 students out of ten own a camera and a laptop; it must be observed the relatively low ranking of desktop computers (58,8%), and – in particular– that the "new generation" tools (handheld, notebook, tablet) occupy the last places. In "others" people reported a significant number of time "Ipod" or mp3 readers (17).

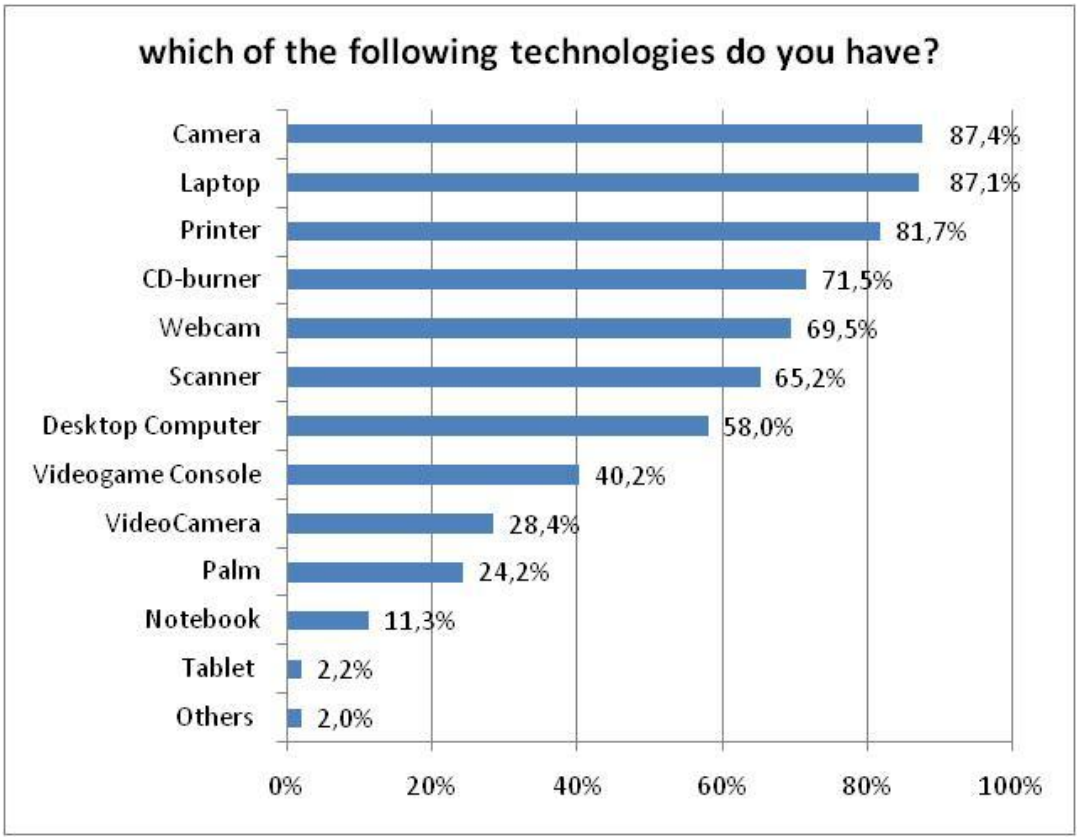


Fig. 54: owned ICTs
(q.3.1) - multiple answers allowed; total 562; data expressed in %

Observing those data in terms of faculties and departments, it emerges that the tablet was owned by people coming from USI-INFO and SUPSI-DTI – namely the more scientific-oriented faculty and department – more than the others (together 66,7% of the total). While, splitting by gender, it is observable a slightly prevalence of male for the following: Cd-burner, webcam, videogame console, video-camera, handheld.

*Question 3.2*shows that daily internet access takes place mainly in two forms: at university for short slots of time, where 48,1% of respondents use internet for less than 30 min; and at home, for longer (36,8% access for 1-3hours, and 27,9% for more than 3 hours).

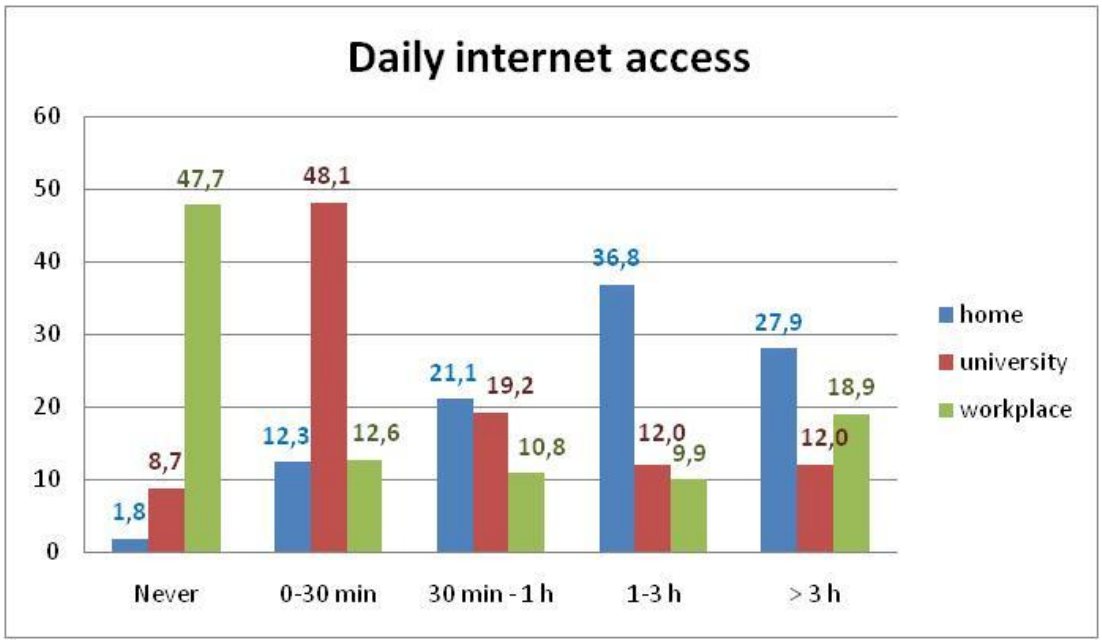


Fig. 55: daily internet access
(q.3.2) - total 557 (5 missing); data expressed in %

LoDE usage's frequency of digital media

Treatment of *Question 4.1* about frequency of online activities followed two steps: firstly, observing which single activities recur more/less often thanks to a conditional formatting of the output grid (see table in section 9.4.2.2, in the annexes); secondly, grouping all the activities in five areas. Both put in evidence usages strongly related to an exploitation of internet focussed on communication and information retrieval purposes.

Among a list of 23 usages, only the following ones are acted by more than one person everyday:

- using search engine, done everyday by 79,3%of sample;
- e-mailing, 78,1%;
- watch movies/listen to music, 38,5%;
- reading newsletters, 36,6%;
- reading newspapers,34,8%;
- social networking, 30,9%.

In parallel, it must be underlined that there was a significant number of people who marked “never”, especially for the following ones:

- updating/modifying your website, never done by 79,3% of respondents;
- selling, 78,1%;
- writing your blog, 72,1%;
- feed RSS, 72,0%;
- eBooks, 63,8%;
- buying, 45,5%;
- evaluating products/services,35,0%.

The following picture shows the frequency of online activities grouped by areas. It immediately stands out that the only area covered everyday by half of sample is “communication/information retrieval”. While 66,2% of respondents are not at all proactive in “producing contents/blogging”, and 55,6% in uses related to commercial (such as: buying, selling, purchasing eBooks, evaluate products/services).

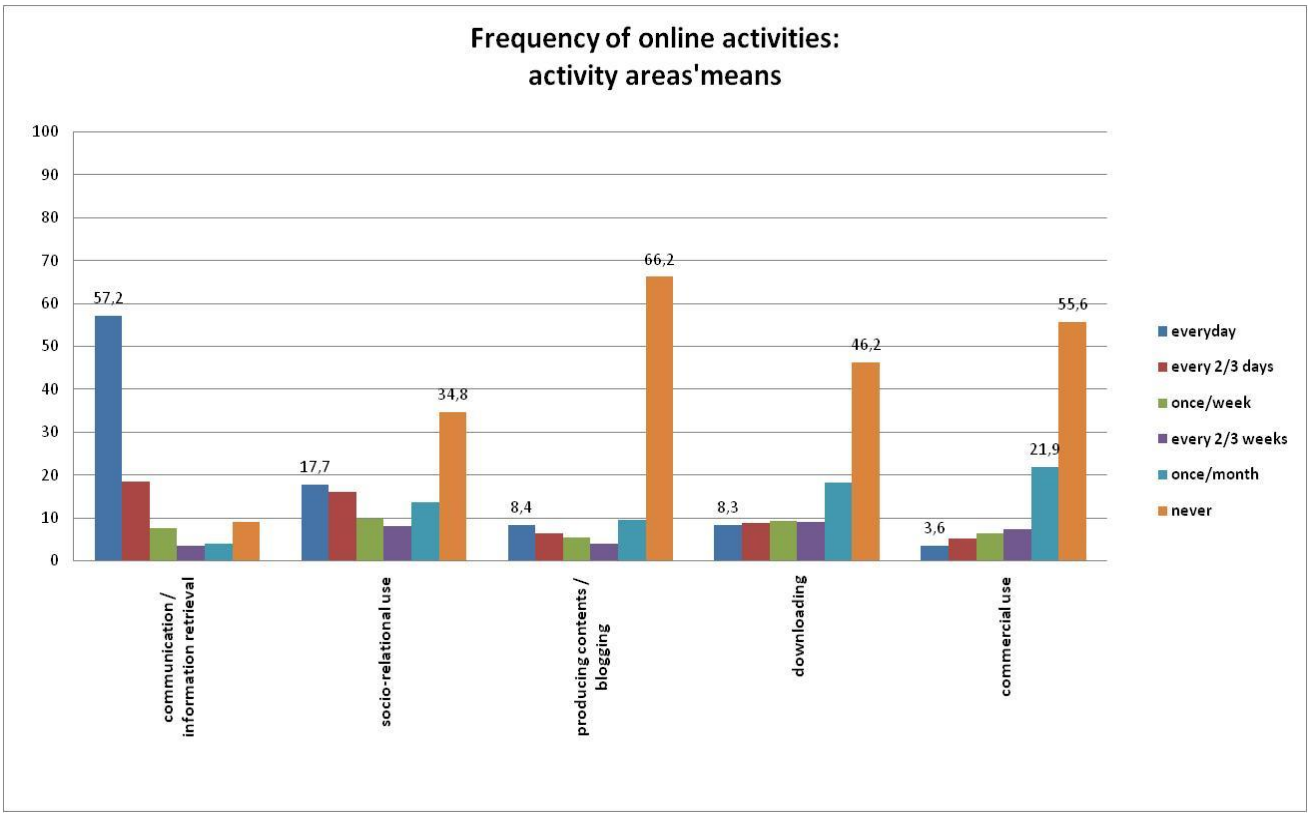
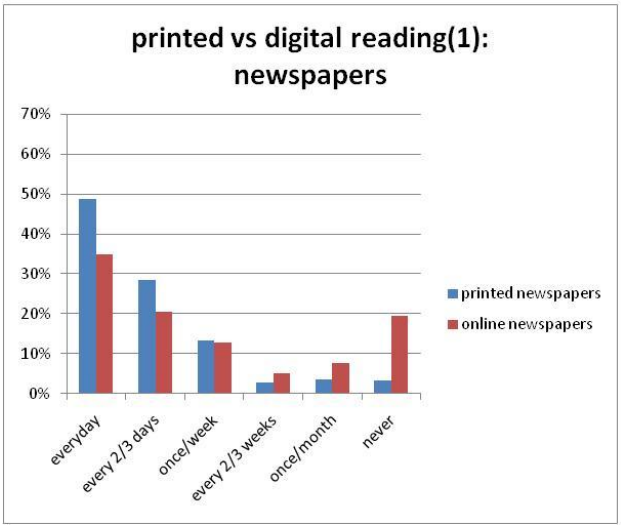


Fig. 56: frequencies of online activities
(q.4.1) by areas- total 517 (45 missing); data expressed in %

It is useful to compare such results with behaviours related to older media, explored in *Questions 4.2 and 4.3*. The next two figures show usages of printed and online newspapers and books. For what concerns newspapers, data are not so astounding: just a little preference to printed (everyday: 48,7%) versus online (never: 19,3%). On the contrary, printed books are clearly preferred (everyday: 35,0%); all in all is astonishing to realize that some tertiary education learners never read books (6,8%) or eBooks (63,8%).



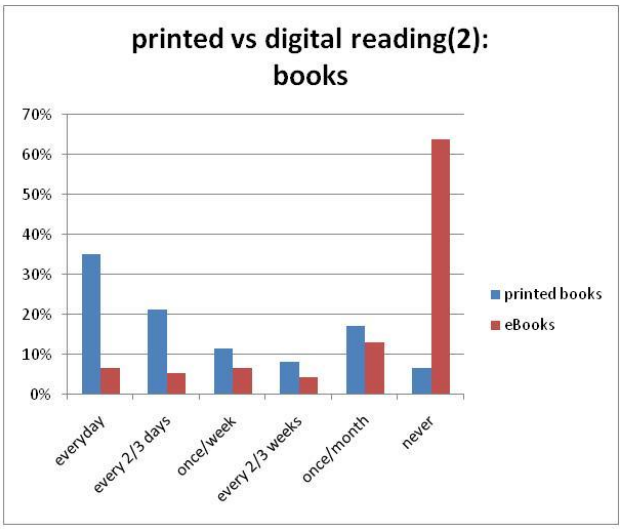


Fig. 57a and 57b: printed vs digital reading
(q.4.1.v & 4.2.a, 4.1.w & 4.2.b)- total 517 (45 missing); data expressed in %

Finally, it is worthwhile to have an idea of the weekly media diet when it comes to TV and radio. As said above, such activities (listening to music and watching videos) are done online everyday by 38,5% of sample; moreover, they are never experienced by 10,8% of people. The next graph (with a different scale), on average, confirms such behaviours.

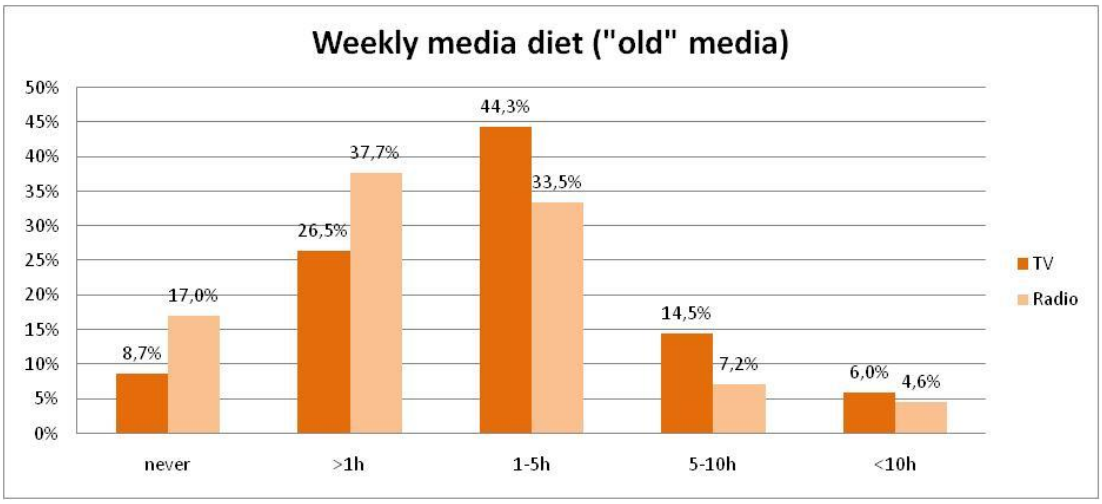


Fig. 58: TV/radio weekly diet
(q.4.3a & 4.3.b) - total 519 (43 missing); data expressed in %

7.2.1.3: Summary of conclusions for this hypothesis

The hypothesis *The presence of ICTs in the LoDE experience is massive* is verified: only 1,8% of respondents never accessed internet, and those who owned ICTs are many and use them often.

Though, even if the access to digital is high, three conclusions emerge:

- rankings of "last generation media" are relatively low (even so, results are two years old and there is possibly a growing trend);
- coming to the frequency of online activities and the media diet, there are very large "elementary usages". In addition, online activities implying an high level of proactivity, such as "producing contents/blogging", are acted by about one fifth of respondents on a weekly basis;
- the fact of owning many ICTs and being often connected does not lead to a substitution of older media with web-bases facilities and services.

The above three points push to investigate these issues in two directions: whether the massive experience is more related to leisure purposes than to learning ones (hypothesis 7.2.2); and if it is possible to categorise different levels of usages, and/or different profiles of learners (hypothesis 7.2.3). The answers of such hypotheses will enable assumptions behind LoDE's abilities to be better defined.

7.2.2: Second hypothesis: ICTs' usages are more related to leisure purposes than to learning ones

As reported by OECD in NML project (see paragraph 3.2.2.3), the different purposes – learning or leisure-oriented – can impact on ICTs' usages.

The basic idea of the second hypothesis can be summarized as follows: we know – and data confirmed – that the presence of digital is massive in LoDE's life; nonetheless, deepening their media diet, it seems that their usages are not so advanced. In other words, if there is no problem in terms of access for everybody, it is not clear if high

familiarity with ICTs fosters specific media abilities, and who is a conscious bearer of them. This is very relevant in our analysis, if such abilities are developed by LoDE transversally in their lives, or they are just limited to some specific areas. It is reasonable to think that a kind of digital divide can select people able to transfer their ability with ICTs in informal experiences (related to leisure), to formal ones (related to learning, or working).

This second hypothesis is meant to narrow the observation, beyond the access issues and the media diet analysis, leading the investigation on ICTs' impact on life in general, and especially on learning.

Tab. 27: 2nd hypothesis

Hypothesis	ICTs' usages are more related to leisure purposes than to learning ones	
Indicators - Measurable aspects	Usages' comparisons	
Issues explored	a. Relevance of digital in LoDE life, in general and in leisure	b. Impact of digital in LoDE learning
Tool details	q. 4.4, 4.5	q. 6.1, 6.2, 8.2, 5.2.f, 5.2.i, 5.1, 5.3, 5.4

7.2.2.1: Details of questions to verify/falsify the hypothesis

In the questionnaire two questions were set to explore the relevance of digital in LoDE life: q.4.4 addressed the issue in general, asking how much ICTs improved different aspects of life; while q.4.5 focussed on leisure, especially observing internet exploitation for tourism goals (what is called eTourism).

Furthermore, a set of questions was specifically designed to understand what specific impact digital media have in learning experiences. One important point to be clarified concerns the double nature of learning: it is either an individual process of signification and a social experience; therefore analysis must keep track of this distinction. For individual aspects the following questions were conceived: 6.1 and 6.2, to explore which ICTs are expressly adopted/used for learning; 8.2, to define in detail what are the most common purposes of the use of an ICT in learning; and 5.2, about the preferred strategies

to learn. Social aspects were observed in two dimensions: where the learning takes place (question 5.1); and collaboration in learning, thanks to questions 5.3 – about which variables affect it – and5.4 – exploring which ICTs are used to collaborate.

Relevance of digital in LoDE life, in general and in leisure

*Question 4.4*presented a grid in which respondents had to express "how much did ICTs improve" the following aspects of life: The way you practice your hobbies or interests, The way you do your student's tasks, The way you learn, The way you have relationships with your friends or your family, The way you share your ideas or creations, The way you collaborate with your peers. Possible answers were: a lot, fairly, a little, not at all.

Question 4.5 was a list of online activities related to tourism, people had to mark yes/no.

Impact of digital in LoDE learning

*Questions 6.1 and 6.2*offered two comprehensive lists of ICTs (48 in total, among hardware, software, online services/facilities) related – or connectable – to learning experiences. Respondents were asked to indicate the ones they used in their studies. Multiple answers were allowed and, where applicable, the possibility to indicate other ones was also provided.

*Question 8.2*presented a grid in which respondents had to express how much they use ICTs, given the following list of learning activities: Communicating with colleagues (for full-time students/workers), Communicating with friends, Communicating with tutors/teachers, Doing a learning task collaboratively, Doing a learning task individually, Gathering information, Listening to course material, Managing information, Preparing oral presentations, Planning group learning tasks, Reading course material, Revising for an exam, Self assessment exercises, Viewing course material, Writing an assignment, Sharing materials, Downloading materials, Doing purchases online (e.g. books). Possible answers were: a lot, fairly, a little, not at all.

*Question 5.2*presented a grid in which respondents had to indicate their favourite learning strategies within the following list: Lectures in classroom, Individual study,

Individual lesson, Printed dictionary/encyclopaedia, Multimedia supports, Online platform (eLearning), Search engines, Websites/specialized blogs, Social networking sites, Wikipedia. People were asked to specify if they prefer such strategies a lot, fairly, a little, not at all.

In this paragraph only "f" (online platform) and "i" (social networking) items are discussed.

In *Question 5.1* respondents had to indicate their usual places of study, given a list. Multiple answers were allowed, including the possibility to specify other places, if applicable.

Question 5.3 was meant to explore which variables are important "when you have to choose a classmate to collaborate with", among the following listed aspects: Competence in the field of study, Ability in using new information technologies, Professional/educational background, Previous experience in working together, Personal knowledge of the classmate, Gender. Multiple answers were allowed, including the possibility to indicate other aspects, if applicable.

Question 5.4 asked which ICTs are used to interact with mates. The following ones were expressly listed: E-mail, Instant messaging, Chat, Mobile phone, Learning Management System. Multiple answers were allowed, including the possibility to specify other items, if applicable.

7.2.2.2: Results

Relevance of digital in LoDE life, in general and in leisure

*Question 4.4*results put in evidence a strong relationship between the permeation of ICTs and improvements in learning experience, according to respondents' perception. Indeed, as the following picture shows, student tasks, collaboration, and learning are the most affected. Overall, the sum of "a lot" and "fairly" results exceeds the half of the sample for all the areas.

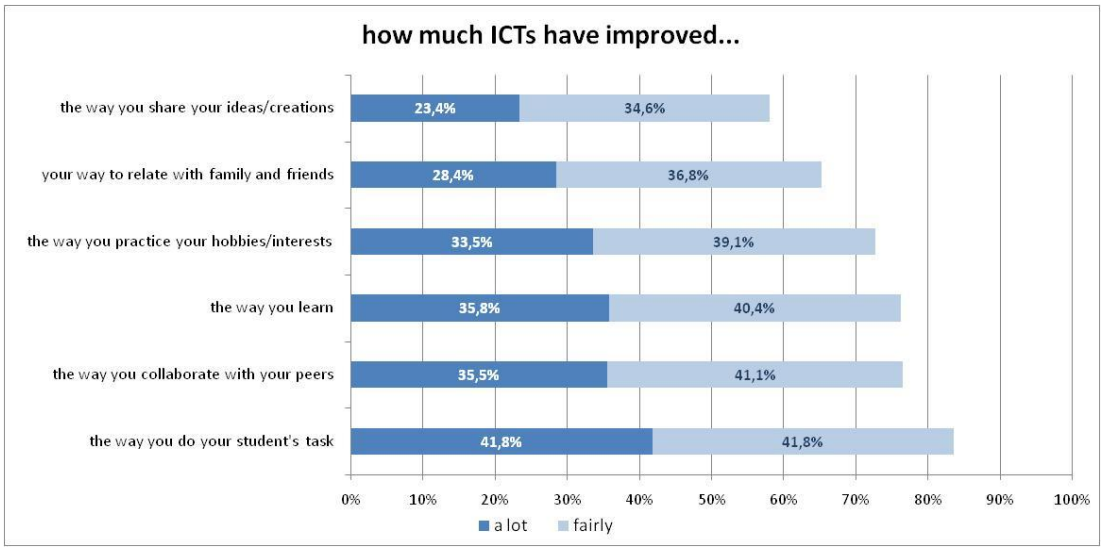


Fig. 59: impact of ICTs in LoDE's lives
(q.4.4) - total 504 (58 missing); data expressed in %

Almost 3 respondents out of 4 declare that ICTs impacted the way they practice their hobbies and interests; such a result is linked to the next question about eTourism, where an high level of digital technology is expected.

Question 4.5, inform us that only two actions were done by more than half of the sample, namely "Bought a ticket online" (57,8%) and "Told about your holidays in social network sites" (50,1%).

Concerning the relevance of digital technology in LoDE's lives, the second hypothesis seems to be – so far – falsified. According to their answers, ICTs enhanced their learning experiences more than leisure ones.

Impact of digital technology in LoDE learning

Aspects related to the individual processes of signification

Question 6.1 and 6.2 data treatment informs us about a great diffusion of digital technology in LoDE learning experiences. Nonetheless the most used pieces of hardware, pieces of software, and online facilities/services do not reveal any advanced attitude being all the top choices very common and widespread diffused. The following three figures highlight ICTs chosen by at least 20% of respondents.

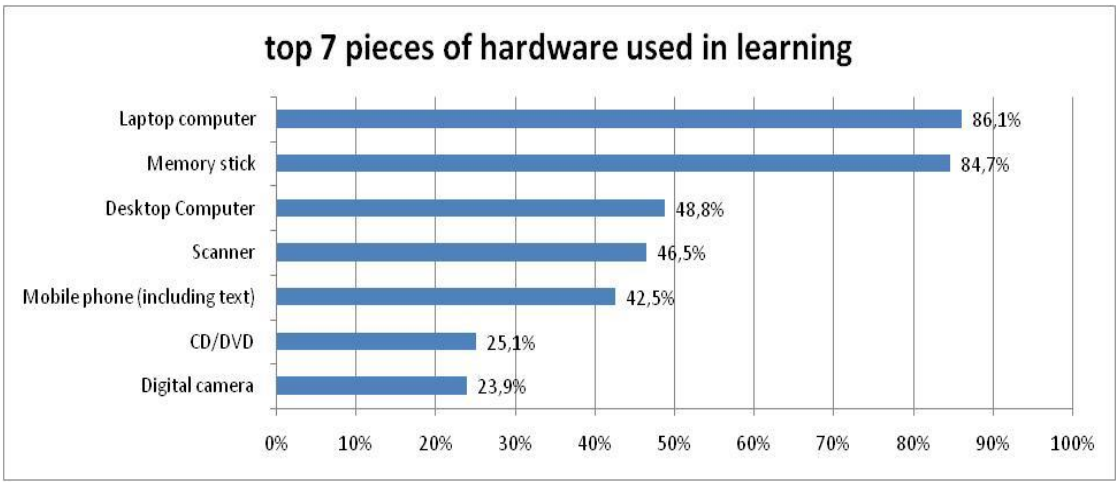


Fig. 60: top 7 pieces of hardware used in learning
(q.6.1 & 6.2) - multiple answers allowed - total 510 (52 missing); data expressed in %

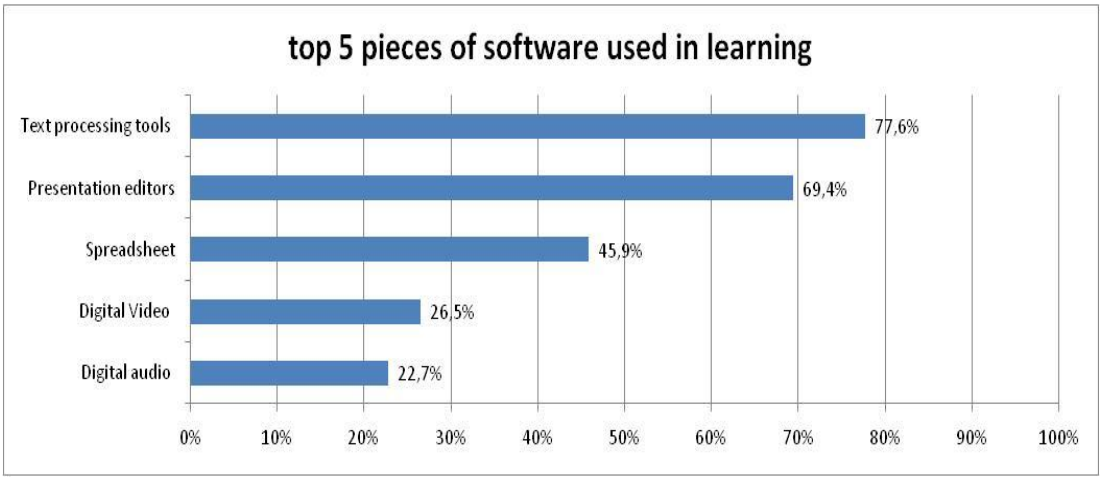


Fig. 61: top 5 pieces of software used in learning
(q.6.1 & 6.2) - multiple answers allowed - total 510 (52 missing); data expressed in %

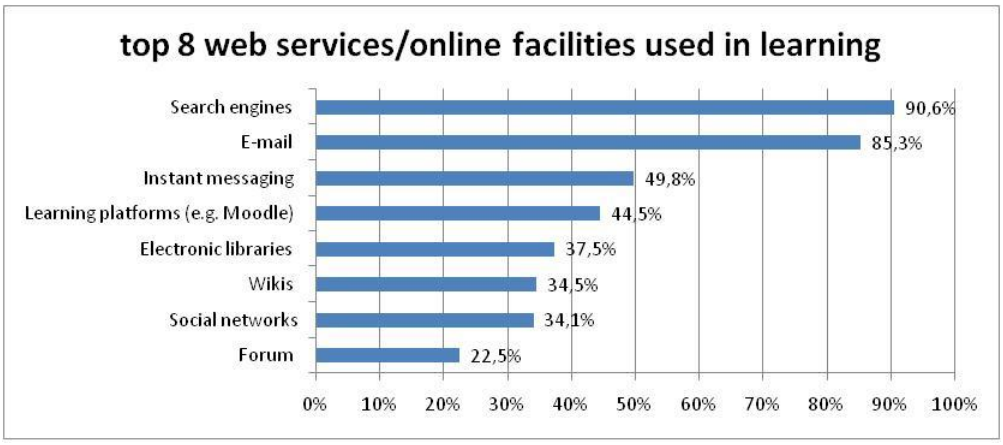


Fig. 62: top 8 web services/online facilities used in learning
(q.6.1 & 6.2) - multiple answers allowed - total 510 (52 missing); data expressed in %

The most important output of the three above figures is the following: ICTs used by more than half of the sample are relatively few and very common. They are:

- laptops (86,1%);
- memory sticks (84,7%);
- text processing tools (77,6%);
- presentation editors (69,4%);
- search engines (90,6%);
- email (85,3%).

Observing answers to questions 6.1 and 6.2 (split by age to verify if age could somehow impact on behaviours), the following emerges:

- among the most used ICTs, people over 30 are the strongest users of search engines (94,4%);
- while, among the less diffused,
    - the younger cohort stands out for bigger appreciation of electronic whiteboards (5,3% versus 3,9% in general)
    - on the other side, older people use slightly more specific pieces of software – such as: statistics, modelling project management, simulation, etc.

Question 8.2 output grid (shown in the next tab.) shows that ICTs are massively adopted in learning activities for elementary purposes. In fact, half of the sample ticked “a lot” common uses of ICTs (such as: gathering information, viewing materials, downloading, communicating with friends). While, 27,3% of the sample uses “a lot” ICTs “to do a learning task collaboratively” and 16,7% uses to do “self assessment exercise”. Remarkably, 14% buys online for learning purposes.

This grid seems to confirm the relevance of new technologies in terms of practices but to disconfirm that ICTs impacted so much learning practices Since ICTs usages of respondents is strongly related to actions which exploit the media, instead of leading to new learning experiences (such as self-assessment exercises) and collaborative study (which is expected to be the greater positive input of new media in education). In the table, the percentages for “a lot” answers are highlighted in *green*, the rankings considered to be too low with respect to the expectations are highlighted in *yellow*, and the percentages for answers showing a prevalence of non uses are highlighted in *light purple*.

Tab. 28: learning purposes to use ICTs
(q.8.2) - total 484 (78 missing); data expressed in %

"In your study, you use ICTs for..."	**A lot**	**Fairly**	**A little**	**Never**
Gathering information	63,6%	29,1%	5,8%	1,4%
Viewing course material	59,3%	29,8%	9,1%	1,9%
Downloading materials	55,2%	30,0%	10,3%	4,5%
Communicating with friends	49,2%	30,8%	14,7%	5,4%
Reading course material	46,5%	36,6%	13,0%	3,9%
Writing an assignment	42,6%	36,2%	16,7%	4,5%
Communicating with colleagues	39,7%	40,7%	16,3%	3,3%
Sharing materials	39,3%	34,3%	19,8%	6,6%
Preparing oral presentations	39,0%	33,3%	19,4%	8,3%
Managing information	37,2%	43,8%	14,9%	4,1%
Doing a learning task individually	32,6%	40,1%	21,3%	6,0%
Revising for an exam	31,2%	32,9%	26,9%	9,1%
Planning a group learning task	28,7%	37,4%	25,8%	8,1%
Doing a learning task collaboratively	27,3%	44,4%	22,7%	5,6%
Communicating with tutors/teachers	18,2%	40,1%	35,3%	6,4%
Listening to course material	17,6%	26,2%	27,3%	28,9%
Self assessment exercises	16,7%	26,0%	34,7%	22,5%
Doing purchases online (e.g. books)	14,0%	17,4%	27,9%	40,7%

Considering just two key-items ["f" and "i"] of *Question 5.2* about "the favourite learning strategies", the wished transfer of skills from informal to formal learning seems to be still a challenge. If excluding the use of internet for information gathering purposes, learners prefer to learn through structured and suited-to-learn online facilities/services; comparing "online platforms" and "social networking sites" it appears a clear prevalence of the formal over the informal.

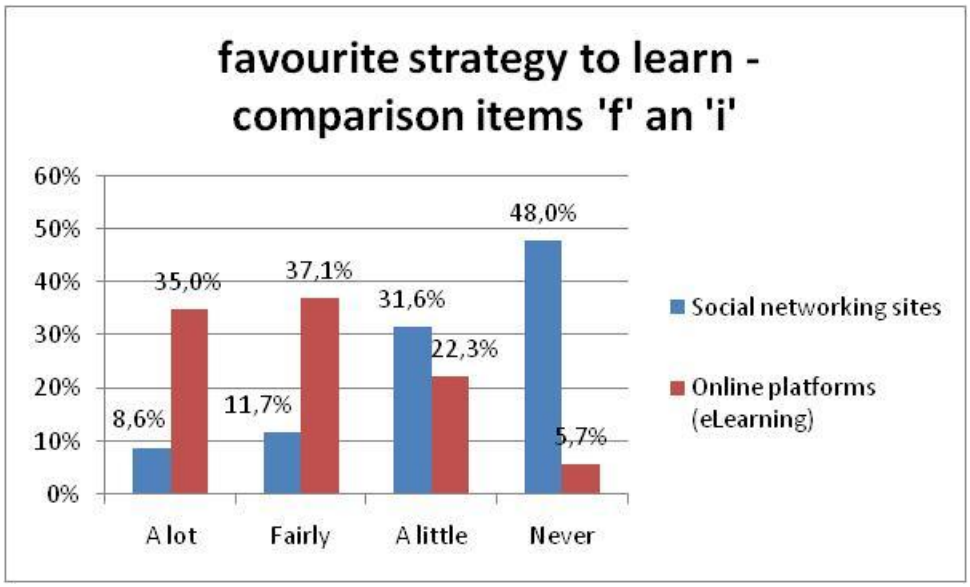


Fig. 63: the favourite strategies to learn, comparison between formal and informal (q.5.2.f & 5.2.i) - total 512 (50 missing); data expressed in %

In other words, despite LoDE are massively interested by the social networking phenomenon, they do prefer to learn via formal strategies.

Aspects related to the social experience of learning

Question 5.1 addresses one of the simplest questions about study, that is "where?". About LV@USI-SUPSI is important to observe the relationship between places and connection. As it emerges clearly, the great majority of respondents prefer to study at home, connected to the internet (69,1% of the sample). In the questionnaire both possibilities were provided–i.e., at home being connected or not –, but answers coincide. Another important aspect to underline is that all the "elsewhere" answers entered by respondents refer to places equipped with an internet connection (public libraries, internet cafes, friend homes—an answer explicitly says "everywhere there is a connection to the net"); excluding "public transport", all the answers are defined by media convergence in learning strategies (namely, either books/notes, and new media).

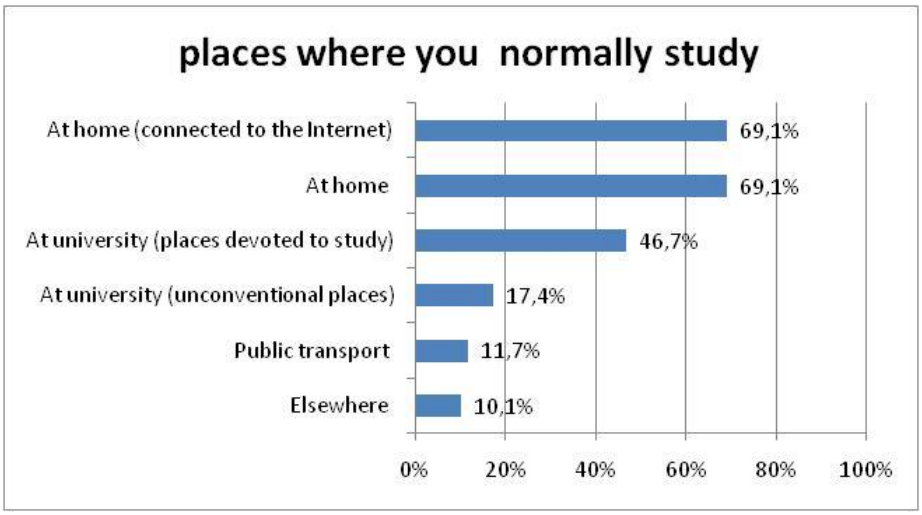


Fig. 64: "places where you normally study"
(q.5.1) - multiple answers allowed - total 512 (50 missing); data expressed in %

*Question 5.3*was about one of the most manifest social aspects of learning, that is collaboration among students. The goal of this question is to envisage which is the ranking of the ability in using ICT, compared to a set of other important aspects of learners collaboration. Investigating this issue within this second hypothesis is aimed to balance the importance of digital technology in learning experiences, given the fact that ICTs are highly used in everyday life, and – as shown in Fig. 59 – students declare ICTs impacted strongly the way they do their learning task.

The following figure puts in evidence – at least – three very important pieces of information: first, personal knowledge of people is a relevant variable for about 7 students out of 10, and the fact of having a previous experience together plays a major role as well (for 59,0% of respondents);second, only 22,1% of people in the sample considers strategic to collaborate with tech-savvy colleagues; third, gender affects in a very little way (4,3%) the collaboration among students. One consideration appears to be reasonable, since the use of ICTs done by LV@USI-SUPSI participants does not stand out for being particularly refined, it is clear that skills related to mastering of digital tools are not a big requisite to study together; in other words, if the exploitation of internet is narrowed around information gathering, it does not come as urgent to choose "geek" mates.

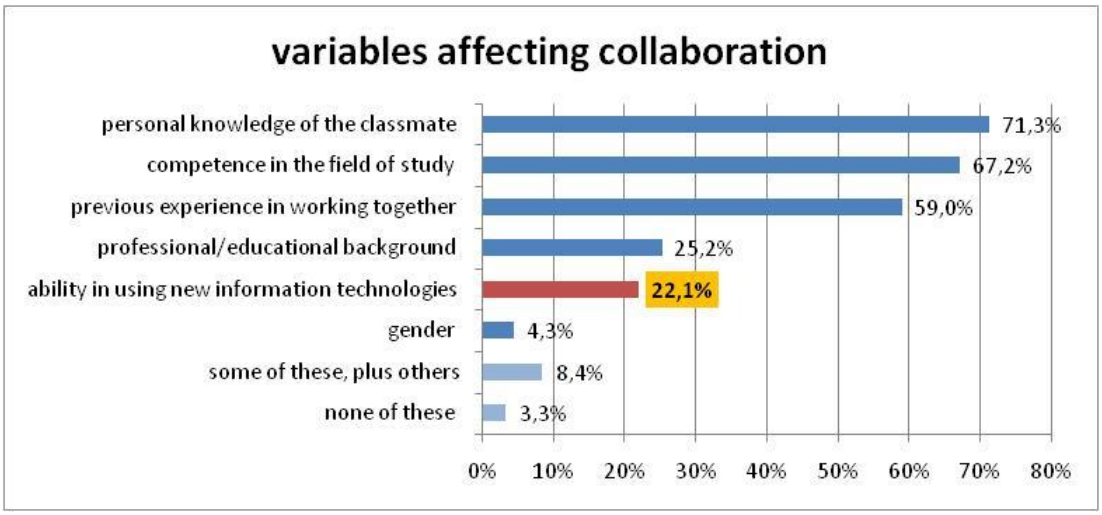


Fig. 65: variables affecting collaboration
(q.5.3) - multiple answers allowed - total 512 (50 missing); data expressed in %

Question 5.4 was a consequent investigation in respect to the previous one, addressing the devices preferred for collaboration. Results substantially confirm what seen so far, showing emailing at the top of the list (92,0%), and cell phones in the second place (75%); common and most diffused tools and means triumph over other strategies which may be more helpful to learning purposes, such LMS (11,3%) conceived *ad hoc* to contain course materials, forum chat, and tutors' didactic references.

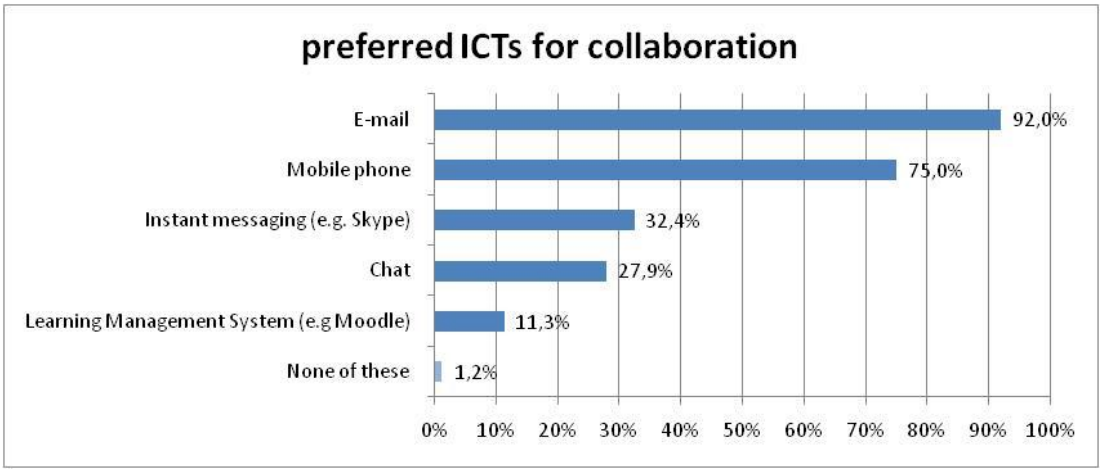


Fig. 66: preferred ICTs for collaboration
(q.5.4) - multiple answers allowed - total 512 (50 missing); data expressed in %

7.2.2.3: Summary of conclusions for this hypothesis

The hypothesis *ICTs' usages are more related to leisure purposes than to learning ones* is partially verified. In facts, ICTs are strongly used by learners though their usages seem to cover significantly only the area of information gathering. In sum, it is possible to say that media permeate massively every aspect of respondents' life, but uses are not so refined; as if to say, LoDE use a lot ICTs – either in general, and in learning – but they do not use ICTs deeply. A direct comparison between eLearning and social networking shows that the expected skills transfer from informal to formal is still a challenge for LoDE, who strongly affirm preferring "a lot" the first strategy (35,0%) versus the second one (8,6%) for learning. Considering that 83,6% of respondents declare ICTs improved the way they do their students' tasks, we could conclude that this improvement is perceived to be important.

7.2.3: Third hypothesis: ICTs' adoption for learning goals is statistically significant for a basic level of learning

Data shown so far call for a deeper analysis. The impressions related to the elementary level of usages need to be statistically (dis/)confirmed. The third hypothesis was elaborated during data analysis and is addressed by the creation of an *index of level of internet usages* and a *factor analysis* set to measure the appreciation of eLearning; both were possible thanks to manipulation of data and production of new variables, aggregating information in the dataset.

Tab. 29: 3rd hypothesis

Hypothesis	ICTs' adoption for learning goals is statistically significant for a basic level of learning	
Indicators - Measurable aspects	Statistical manipulation of dataset: creation of new variables and factor analysis	
Issues explored	*Index* of skills' level in online activities	*Factor analysis* to measure eLearning appreciation
Tool details	Index composed with items of question 4.1	*Described in paragraph 7.2.3.1*

7.2.3.1: Details of questions to verify/falsify the hypothesis

Question 4.1 (already described in par 7.2.1.1) can be observed from many points of view, in order to obtain more information about LoDE attachment to new technologies and, hopefully, to get some predictors/descriptors of disposition to digital learning.

Following this path of investigation, the *"index of skills' level in online activities"* was elaborated during data analysis, considering answers "every day" to question 4.1's items, aggregated into three levels of ability. In details, the new variable uses "every day" answers to items as indicators of the skill's level in doing online activities; every individuals obtain a score on a continuum – from 0, meaning respondent never answered "every day", to maximum, meaning all "every day" answers to the listed items – which is subsequently converted into categories. In a first phase we tried to obtain four levels (namely, elementary, medium-low, medium-high, advanced), but at the end of the process three levels emerged "advanced/medium/elementary online activities' skill level".

Rationales justifying arbitral choices taken to create this new variable are the following: the level of skill involved in online activities was considered elementary, medium, or advanced according to the implied complexity and involvement.

The idea behind such analysis is the following: high rankings in the index of skills' level in online activities can unveil who are the most ICT-oriented respondents; then, it should be possible to identify the LoDE who are more prepared to take profit of digital opportunities and direct them to learning purposes.

7.2.3.2: Results

Results from analysis of *index of skills' level in online activities'* are not so insightful and narrowing as expected to be. The expectation was to find a great prevalence of elementary usages, in order to confirm what emerged from data analysis related to hypotheses 1 and 2. On the contrary, almost three people out of five fall into the "medium" category. Indeed, no user pattern can be detected. On one side, this output disconfirms the idea of LoDE as "geek" cohort; but equally does not offer any satisfying

interpretation key to describe/predict the disposition of learners to adopt ICTs for their learning needs.

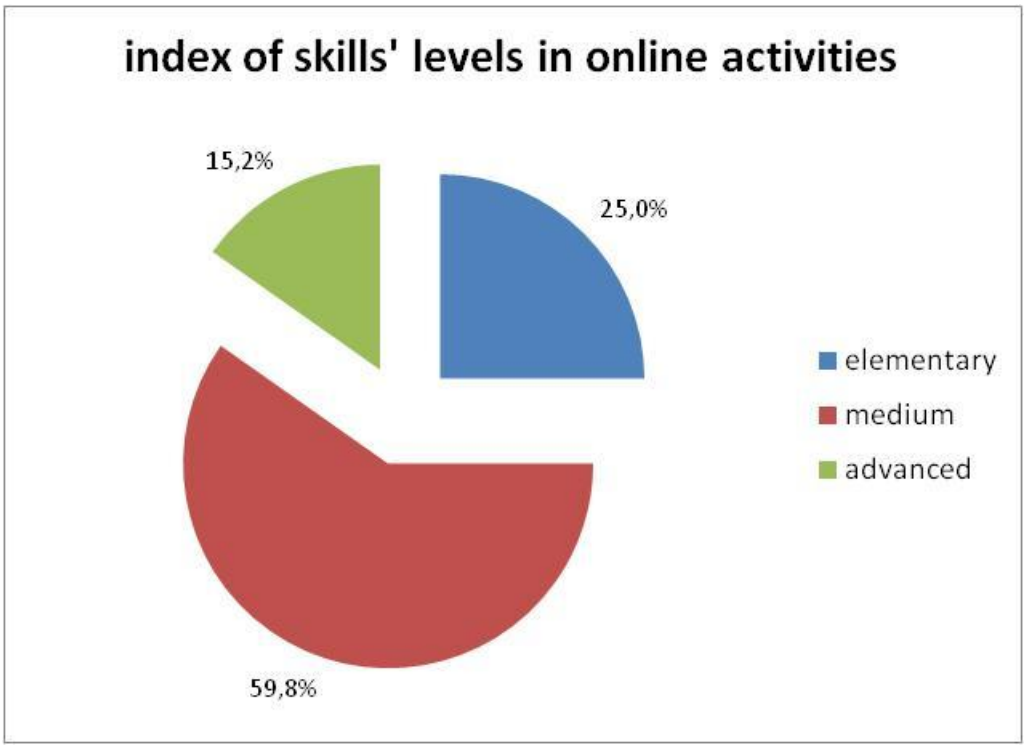


Fig. 67: index of skills' level in online activities
(new variable, after q.4.1) -total 512 (50 missing); data expressed in %

The above results do not show anything invalidating/validating, and does not resolve in any way our hypothesis; the normal curve is substantially respected by respondents. Moreover, crossing this variable with other socio-demographic information does not reveal any significant explanation.

7.2.3.3: Factor analysis and hypothesis 3B

Given the fact that not even the above is helpful to determine what really influences the adoption of ICTs in learning, the need for a new hypothesis emerged. The goal became to investigate what can predict the appreciation of eLearning. Three dimensions shape the hypothesis 3B:

Tab. 30: hypothesis 3B

eLearning appreciation is explainable thanks to advanced practices with ICTs. In particular: *- if learners are familiar with learning-related ICTs;* *- if learners act very often advanced online activities;* *- if learners' behaviours indicate they are skilled in a proactive use of digital media.*

In order to verify this new hypothesis about eLearning appreciation a statistical manipulation of dataset aimed to run a factor analysis was necessary. In details, four new variables were used, following an arbitral procedure:

1. (dependent variable) "scale of eLearning appreciation", aggregating means of items directly related to eLearning appreciation in question 8.1. At the end of the process three categories emerged "high/medium/low eLearning appreciation";
2. "learning-related ICTs", splitting in two all the items listed in question 3.1 and creating dummy variable (=1 if they possess ICTs considered more learning related and 0 otherwise);
3. "index of skills' level in online activities", considering answers "every day" to aggregated items in question 4.1 considered in three growing level of ability. At the end of the process three levels emerged "advanced/medium/elementary online activities' skill level";
4. "areas of digital proactivity", keeping the items aggregation of question 4.1 in five areas of different – and growing – expression of involvement and proactivity (see: par. 7.2.1.1): downloading, communication/information retrieval, socio-relational use, commercial use producing contents/blogging.

Rationales justifying arbitral choices taken to create new variables are the following: ICTs were considered learning-oriented, or *vice versa* leisure-oriented, according to the main use learners can do with that specific tool. Anyhow the choice can not help to be arbitral and, therefore, susceptible of critics, since the point is that, by now, each technology owned by great majority of LoDE can be used both for leisure and learning.

It is up to users, who give the sense/direction of the practice with ICTs, (see the difference between processes of adoption and appropriation discussed in par.1.3).

7.2.3.3.1: What can predict the appreciation of digital learning?

Factor Analysis Methodology

In this paragraph we will stress the LV@USI-SUPSI dataset to analyze which are the elements influencing a student in being an e-learner. The research purpose that will lead this paragraph regards the identification of the determinants that influence the respondents' appreciation of eLearning. In particular, a variable will be used to measure the aggregate level of eLearning appreciation as the dependent variable. The scale of this variable is calculated using the average of the values of different variables includedin the dataset. To test whether this scale is appropriate, factor analysis and reliability analysis were run.

Factor analysis is used mostly for data reduction purposes, either to get a small set of variables (preferably uncorrelated) from a large set of variables (most of which are correlated to each other) or to create indexes with variables that measure similar things. It is a collection of methods used to examine how underlying constructs influence the responses on a number of measured variables. Factor analyses are performed by examining the pattern of correlations (or covariances) between the observed measures. Measures that are highly correlated (either positively or negatively) are likely to be influenced by the same factors, while those that are relatively uncorrelated are likely to be influenced by different factors.

Reliability analysis refers to the fact that two people who have the same characteristics, in terms of the construct being measured, should get the same score. In statistical terms, reliability analysis is based on the idea that individual items should produce consistent results.

For the factor analysis, an aggregate variable was set measuring eLearning appreciation as a dependent variable. The scale is calculated using a mean score of the variables

presented in Table 31. To test if this scale is indeed appropriate for our analysis we have subjected the seven variables to factor analysis and reliability analysis.

Tab. 31: variables used for dependent scale (eLearning-related items in question 8.1)

a. eLearning is an important element of my courses
b. Without eLearning I would be unable to study
c. eLearning is one of a number of important components of my courses
d. eLearning makes courses more enjoyable
e. With eLearning I interact more with other students/ **commuting**
j. eLearning makes learning easier for me
k. It would be good if there were more eLearning in my courses
1. agree …… 3. Disagree

The first of these analyses seems to be appropriate as we have Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.853. Both the Eigen values test and the scree-plot lead to the conclusion that a single dimension underlies these variables. The only factor with Eigen values above 1 (3.521), explains 50,3% of the variables variances. All variables have loadings bigger than 0.4, the smallest value being 0.524 for the commuting variable. The problematic effect of this variable in the scale can also be seen in the reliability test where it is the only variable to have a bigger value for Cronbach's alpha if deleted, from 0.830 (the value for the scale as a whole) to 0.835.

Although the empirical results may be inconclusive, we have one dimension and a reasonable correlation between commuting and the rest of the variables but we have, for the same variable, a bigger Cronbach's alpha when deleted than the original value for the scale. The information brought by this variable may be important as it is the only one that measures this particular aspect of the dimension. Furthermore it does not seem that an increase in Cronbach's alpha of 0.05 is enough to compensate for the plus of information and consistency of our scale.

To test hypothesis 3B, ordinary least squares regression models were run. This type of regression is used to determine the impact of a series of explanatory variables X_i on the

dependent variable Y (eLearning appreciation). The first model will include the effect of some socio-demographic variables on our dependent variable, controlling for a set of possible confounding variables. The second and the third model will also include specific behaviour variables and interaction effects that may further explain the concept of eLearning appreciation.

The list of explanatory variables included in the models are the following:

- *age* (describing the age of the individuals),
- *male* (dummy variable; 1 if the individual is a man and 0 otherwise),
- there is a list of variables describing the *countries* of origin of the involved students. List of dummy variables: *Switzerland, Italy, Germany, France and other Eu* countries, being the reference category "the rest of the world",
- the dummy variable *Humanities* which represents the field of study, namely if the students attend a more social/humanistic *faculty/department* (USI-COM, USI-ECO, SUPSI-DFA, SUPSI-DSAS) or a scientific one (all the others).

The previous variables are those included in the first model. The second model contains, in addition to the variables described above, further variables belonging to the attitudes and behavioural field. These are: *medium* and *advanced* that refer to the skill level of the students, namely if they frequently deal with difficult ICTs tasks in their studies; *ictlearning* that represents the possession of ICTs learning related from the part of the students (dummy variable =1 if they possess the ICTs that were considered learning related and 0 otherwise). Finally the variables *commercial* and *download* are generated to explain the kind of users referring to their most frequent activities involving the ICTs.

Findings

The first model in Table 32 presents the effect of the explanatory variables on eLearning appreciation while controlling for other possible confounding variables. The control variables are divided in two main dimensions: socio-demographic effects and individuals' attributes. To check the variable description see section 9.4.3.1 in the annexes.

Tab. 32: Ordinary Least Square Regression Model

Dimension		Variables	Model I	Model II
Socio - demographic		Intercept	1.898	2.771
	Demographic	Age	0.005	0.005
		Male	0.089*	0.011
	Countries	Swiss	-0.32***	-0.241***
		Italy	-0.257***	-0.205***
		Fr+De+Ue	-0.08	-0.054
	Education	Humanities	0.18***	0.18***
Individual characteristics	***Skills' level***	Advanced		-0.042
		Medium		0.022**
		Ictlearning		-0.056
	Study preferences	Class lessons		-0.013
		Individual lessons		0.013
	Behaviour	Commercial		-0.108***
		Download		-0.073

N=562; *=p>0.1, **=p>0.5, ***=p>0.01

One of the main outputs is the non significant effect of the demographic variables of gender and age. This is an outstanding result: age is not significant, it means therefore that being young or old does not affect the probability of being an eLearning appreciator. This finding disconfirms the literature mentioned in the theoretical part (par. 3.2.1.1), which describe the younger cohort as being more likely to appreciate and use eLearning. Though, young respondents in LV@USI-SUPSI declare to be great eLearning appreciator: it comes again, as consistent reasonable explanation, that what influences students' attitude towards ICTs in learning is not the variable age *per se*, rather the technological environment in which they are embedded.

The variable gender is also not significant and leads to the conclusion that the appreciation of eLearning does not depend on the sex: males and females show the same attitudes in respect to that.

The first variables that are important to explain our dependent ones are related to the country of origin. Being a Swiss citizen in fact is relevant in the explanation of the eLearning appreciation. This result is though negative: being born in Switzerland has then a negative effect on the probability of being an appreciator of the use of technologies at school. More precisely, if observing the second column of table 23, Swiss people show a 24,1% less probability to be appreciator then the rest of the world. The same happens in Italy, where the probability is also negative (20,5%). It is meaningful trying to explain this result highlighting that technologies are seen as the solution of students problems and difficulties in communication and information retrieving, if coming from a less advantaged context; as if to say, Swiss and Italian people need much less ICTs, so they are lower appreciators of learning *via* ICTs.

The last variable part of the socio- demographic category concerns the kind of education attended. Here the results are also unattended, because what we see is that the students belonging to the more social/humanistic faculties (Communication, Economics, Education and Learning, Social Sciences) are more likely to be appreciators of technologies in the studying field compared to the ones of scientific faculties. Attending to a humanistic faculty leads to have a higher probability (18%) of being an estimator

than their scientific colleagues. This finding is probably understandable from the point of view of the critics(par. 3.2.3.3.1), who describe how living in a technological environment with a free access to ICTs makes students being less addicted to them, because they already know their potentialities and deficiencies.

Trying to go deeper in our analysis, we add to our model some more explanatory variables, being part of what we named *individual characteristics.* The related results are included in the second column of the above table.

The variables added in the second model try to give more insight on the topic under study. What we notice at first sight is that the gender and age variables have not acquired any significant value, this is in line with what described before and do not confound our previous findings.

The first set of variables we included are related to personal skills of individuals. The variables *advanced, medium* and *elementary* have been created for the sake of our investigation and all refer to the level of competencies the students possess in the utilization of ICT tools. What we observed from the results is that indeed having a medium competence compared to a lower one leads to a higher appreciation of the eLearning methods. The step from elementary level in ICTs utilization, to having a medium competence is then important in the process of appreciation of it. However, a higher level of knowledge (advanced) has not a significant effect (see table 23). This result is predictable if we consider the fact that advanced users of ICT do not show great satisfaction in the eLearning process due to the fact that their competences lead them to acquire a more “snob” and suspicious attitude towards the technologies used in their studies compared to those who do not show these high abilities in managing them.

An unexpected finding is that the study preferences have no role in the explanation of our dependent variable, since they are both non significant in the model. Despite results show that most of the students are relatively traditional in their way of learning, this does not reflect in a preference (or non preference) in the eLearning methods.

An interesting finding can be seen referring to the behaviour of the students. We have created new variables trying to describe the behavioural profiles of the individuals, according to what kind of activities they perform with the use of ICT(if they are bloggers, commercial users, information retrievers, downloaders or if they use ICT for socialization aims.) What has been found in respect to that is that being a commercial user leads to a negative attitudes in respect to the appreciation of eLearning. Individuals who use ICT mainly to buy or sell products or services on the net have a lower probability (of 10,8%) to be eLearning appreciators compared to those who perform the other activities.

7.2.3.4: Summary of conclusions for this hypothesis

The (starting) third hypothesis *ICTs' adoption for learning goals is statistically significant for a basic level of learning* was abandoned– because of the lack of diriment results – to leave place to hypothesis 3B, *eLearning appreciation is explainable thanks to advanced practices with ICTs*, investigated throughout factor analysis which enlightened many other important aspects.

Hypothesis 3B is statistically verified, but in a very little dimension: indeed the fact of being eLearning appreciators is little explained/predicted by the fact of owning a medium level in skills related to online activities (2,2%); and negatively explained/predicted by the fact of having a behaviour related to commercial (-10,8%).

7.2.4: Fourth hypothesis: ICTs predilection in learning contexts is explainable/predictable thanks to demographic variables

Going in depth in the hypotheses verification, it seems more and more that LoDE behaviours and attitudes towards ICTs in learning are explainable just referring to concept like familiarity and media-fulfilment of the environment. Said that, it is necessary to remove any doubt related to the possible influence of socio-demographic attributes.

Tab. 33: 4th hypothesis

Hypothesis	ICTs predilection in learning contexts is explainable/predictable thanks to			
	Age variable	Country of origin	Gender	Field of studies
Indicators - Measurable aspects	Crosstabs composed by demographic questions and items related to digital learning in questions 5.2, 4.4, and 8.1			
Tool details	q. 2.3	q.2.5	q.2.4	q.2.6

7.2.4.1: Details of questions to verify/falsify the hypothesis

*Question 8.1*proposed a list of statements concerning eLearning and the importance of ICTs in educational experience, and respondents had to express their agreement/disagreement. The list was the following: eLearning is an important element of my courses, Without eLearning I would be unable to study, eLearning is one of a number of important components of my courses, eLearning makes courses more enjoyable, My university is not very smart in the way it uses eLearning, With eLearning I interact more with other students, I find difficult to use a computer, I find difficult to use technological devices (e.g. Pda/mobile phone/mp3 player), Having access to a computer connected to the internet is a problem for me, eLearning makes learning easier for me, It would be good if there were more eLearning in my course.

Questions 5.2 (preferred strategies to learn) and *4.4* ("how much ICTs improved...") have been described above.

The crosstabs procedure was run for all the possible crossings between all the items of questions 8.1, 5.2, and 4.1, with the four socio-demographic references (namely: age classes, gender, country of origin, and field of studies).

In order to verify any statistical influence of socio-demographic 378 tabs were put under analysis (see annexes, section 9.2.3.2 for details). The relationship between two variables is inspected *via* Chi-square tests; if the case occurs, the analysis of symmetric measures reveals the strength and the direction of relationships.

According to diffused habits in statistical analysis, we kept under control the Pearson's Chi-Square results to check the assumed relationship – i.e.: *p>0,05*, as literature in the field suggests; while to determine its nature we considered the Cramer's V value (converted in %).

7.2.4.2: Results

Does age make any statistical differences?

Out of 81 crossings, Pearson's values resulted significant in 8 cases, meaning "age classes" variable is proofed to have a statistical influence. Observing the Cramer's V, we can say what follows:

Tab. 34: crosstabs' synthetic results "age classes" * question 8.1

The fact of being older...	...increases of...	...the likelihood to answer that...
	4,0%	"It would be good if there were more eLearning in my courses"

Tab. 35: crosstabs' synthetic results "age classes" * question 4.4

The fact of being older...	...increases of...	...the likelihood to consider that ICTs improved significantly...
	0,8%	"the way you practice your hobbies or interests"
	0,5%	"the way you do your students' tasks"
	0,1%	"the way you learn"
	3,9%	"the way you collaborate with your peers"

Tab. 36: crosstabs' synthetic results "age classes" * question 5.2

The fact of being older...	...increases of...	...the likelihood to be more in favour of...
	0,2%	"lectures in classroom"
	0,6%	"printed dictionary/encyclopaedia"
	0,3%	"online platforms (eLearning)"

As tables show, percentages are low values (the most relevant are highlighted in yellow); furthermore, at the growing of age, it is proofed a statistical growth of behaviours which seem to be contrasting each others (e.g.: either "lectures in classroom" and "eLearning").

Overall, it emerges that learners, the older they are, they are 4,0% more likely to ask for more eLearning, and 3,9% more declaring ICTs impacted on the way they collaborate with their peers.

Does gender make any statistical difference?

Out of 54 crossings, Pearson's values resulted interesting in 6 cases, meaning "gender" variable is proofed to have a statistical influence. Observing the Cramer's V, we can say what follows; it has to be underlined that, being a mutually exclusive variable, we adopted a dummy variable (0 = female), hereby the following schemas.

Tab. 37: crosstabs' synthetic results "gender" * question 8.1

The fact of being male...	...increases of...	...the likelihood to answer that...
	2,5%	"It would be good if there were more eLearning in my courses"

Tab. 38: crosstabs' synthetic results "gender" * question 4.4

The fact of being male...	...increases of...	...the likelihood to consider that ICTs improved significantly...
	0,0%	"the way you practice your hobbies or interests"
	0,1%	"the way you relate with your friends and family"

Tab. 39: crosstabs' synthetic results "gender" * question 5.2

The fact of being male...	...increases of...	...the likelihood to be more in favour of...
	0,1%	"individual study"
	0,5%	"printed dictionary/encyclopaedia"
	4,6%	"search engines"

Results show interesting percentages only in two cases, namely LoDE are 2,5% more likely to ask for more eLearning, and 4,6% more "search engines"-oriented if they are male. An important elucidation is needed: the "0,0%" in table 29 stands for the complete Cramer's V string 0,00010342121781781; this means that Pearson's value indicates there is a statistical influence, but Cramer's V informs that is nearby to nothing. The same explanation is valid for all the similar cases in the following tables.

Does country of origin make any statistical difference?

Out of 243 crossings, Pearson's values resulted interesting in 6 cases, meaning "country of origin" variable is confirmed to have a statistical influence.

Being a non-continuum variable, the following schemas must be read differently than previous ones: they simply show when "country of origin" variable has an influence; the involved countries are specified in the text.

Tab. 40: crosstabs' synthetic results "country of origin" * question 8.1

Variation in "country of origin" variable...	...impacts of...	...the likelihood to answer that...
	0,5%	"eLearning makes course more enjoyable"
	0,5%	"eLearning makes learning easier for me"
	0,0%	"It would be good if there were more eLearning in my courses"

Data put in evidence that coming from Switzerland and Italy lowers down the likelihood to appreciate eLearning in terms of simplification and enjoyment in learning.

Tab. 41: crosstabs' synthetic results "country of origin" * question 4.4

Variation in "country of origin" variable...	...impacts of...	...the likelihood to consider that ICTs improved significantly...
	2,0%	"the way you practice your hobbies or interests"
	0,0%	"the way you learn"

Percentages in the crosstab are quite contrasting, nevertheless it seems that the fact of being Italian relates to a higher likelihood to consider ICTs impacted on hobbies and interests.

Tab. 42: crosstabs' synthetic results "country of origin" * question 5.2

Variation in "country of origin" variable...	...impacts of...	...the likelihood to be more in favour of...
	3,1%	"printed dictionary/encyclopaedia"

From data it emerges that coming from less developed countries augments the likelihood to prefer printed dictionaries and encyclopaedias.

Observing the three above tables together, it does not seem reasonable to conjecture any general rule, or to deduce some unquestionable conclusion; even if numbers point out statistical relationships. This is perfectly acceptable, and it is highly recommended to explore further and deeper this hypothesis before to come to any conclusion.

Does field of study make any statistical differences?

Out of 243 crossings, Pearson's values resulted interesting in 12 cases, meaning "faculties/departments" variable has a statistical influence.

Being a non-continuum variable, the following schemas put only in evidence when "faculties/departments" variable has an influence; since results were not enough discriminating and/or clear (i.e.: a number of cases when the *p* revealed a relationship between variables, which, anyway, was difficult to see and to interpret in the crosstabs), we took the arbitral decision to merge all the USI faculties *versus* all the SUPSI departments, and all the Humanities *versus* the Scientifics.

Tab. 43: crosstabs' synthetic results "faculties/departments" * question 8.1

Variation in "faculties/departments" variable...	...impacts of...	...the likelihood to answer that...
	0,0%	"eLearning is an important element of my courses"
	0,3%	"eLearning makes course more enjoyable"
	0,0%	"eLearning makes learning easier for me"
	0,2%	"It would be good if there were more eLearning in my courses"

Given the fact we have 9 faculties/departments, the percentages are too low to be accepted as meaningful explications of LoDE's behaviours.

Tab. 44: crosstabs' synthetic results "faculties/departments" * question 4.4

Variation in "faculties/departments" variable...	...impacts of...	...the likelihood to consider that ICTs improved significantly...
	1,0%	"the way you practice your hobbies or interests"
	4,4%	"the way you do your students' tasks"
	1,4%	"the way you learn"
	1,8%	"the way you relate with your friends and family"

For what concerns the above table, despite the relatively high percentage, is hard to identify which faculties/departments impact more on the model. Overall, it seems USI students are slightly more convinced that ICTs impacted on their lives.

The only case standing out is SUPSI-DSAN, being part of it makes people 4,4% less likely to consider ICTs improved "the way they do their students' tasks; while all the others faculties/departments express considerations close to the general mean.

Tab. 45: crosstabs' synthetic results "faculties/departments" * question 5.2

Variation in "faculties/departments" variable...	...impacts of...	...the likelihood to be more in favour of...
	0,0%	"individual study"
	1,2%	"printed dictionary/encyclopaedia"
	0,0%	"online platforms (eLearning)"
	3,9%	"specialized websites/weblogs"

Despite a 1,2% of increase pointed out by statistics about "printed dictionary/encyclopaedia", there are no clear patterns standing out from observation of crosstabs. Concerning "specialized websites/weblogs" it is appropriate to affirm that there is a bigger preference of this learning strategy if studying at USI-INFO or SUPSI-DTI; statistically speaking, we can assume there is a 3,9% of likelihood to appreciate more "specialized websites/weblogs" if studying in a department focused on informatics.

Aggregating USI vs SUPSI

In order to better understand the impact of field of study on questions 8.1, 4.4, and 5.2, all the USI faculties were grouped *versus* all the SUPSI departments. The rationale comes from the statistical evidence of a sort of impact, but very difficult to narrow if observing it at faculties/departments level.

Therefore a dummy variable was created (0 = all USI faculties grouped; 1 = all SUPSI departments grouped). Out of 54 crossings, institution affiliation is proofed to have a statistical influence in 8 cases, as shown in the following tables.

Tab. 46: crosstabs' synthetic results "USIvsSUPSI" * question 8.1

Studying at USI...	...impacts of...	...the likelihood to answer that...
	0,0%	"eLearning is an important element of my courses"
	0,1%	"eLearning makes course more enjoyable"
	0,0%	"eLearning makes learning easier for me"

Also aggregating per institutions, results do not offer any standing piece of information. Though, it is unquestionable that being part of USI increases of 0,1% the likelihood to consider "eLearning more enjoyable" (for the little it means).

Tab. 47: crosstabs' synthetic results " USIvsSUPSI " * question 4.4

Studying at USI...	...impacts of...	...the likelihood to consider that ICTs improved significantly...
	0,9%	"the way you practice your hobbies or interests"
	0,3%	"the way you do your students' tasks"
	0,8%	"the way you learn"
	0,0%	"the way you relate with your friends and family"

A similar conclusion could be drawn for the above table. Studying at USI statistically explains the idea that people have about the impact of ICTs in their life, even if the explanation is limited to very little percentages.

Tab. 48: crosstabs' synthetic results "USIvsSUPSI" * question 5.2

Studying at USI...	...impacts of...	...the likelihood to be more in favour of...
	1,3%	"online platforms (eLearning)"

It is important to register that USI students are – on average – more likely (1,3%) to appreciate eLearning; a possible explanation is that USI courses were stressing the online platform Moodle more intensively than SUPSI, at the time the questionnaire was answered.

Aggregating Humanities vs Scientifics

The same reasoning was followed for the aggregation of faculties/departments: those more social/humanistic-oriented versus the ones more oriented to scientific disciplines.

A dummy variable was created (0 = humanities; 1 = scientifics). Out of 54 crossings, institution affiliation has a statistical influence in 3 cases, as shown in the following

tables. Remarkably, no statistical relationship emerged for question "how much ICTs improved...". In all standing cases the more scientific faculties/departments emerged.

Tab. 49: crosstabs' synthetic results "Humanities vs Scientifics" * question 8.1

Studying Scientifics...	...impacts of...	...the likelihood to answer that...
	5,1%	"eLearning makes learning easier for me"
	1,6%	"It would be good if there were more eLearning in my courses"

This is, probably the first real outstanding result from all the crosstabs run: studying in a faculty/department more scientifically-oriented increases by 5,1% the likelihood to consider eLearning useful in making the learning experience easier; therefore it is consistent to see that the same group, by 1,6%, is more likely to ask for more eLearning in courses.

Tab. 50: crosstabs' synthetic results "Humanities vs Scientifics" * question 5.2

Studying Scientifics...	...impacts of...	...the likelihood to be more in favour of...
	0,1%	"specialized websites/weblogs"

Despite the very low percentages – almost negligible –, the results provide the statistical confirmation of what was previously just a clue: studying discipline such Informatics, it is more likely to appreciate specialized websites and weblogs.

7.2.4.3: Summary of conclusions for this hypothesis

The long journey done with crosstabs puts clearly in evidence that socio-demographic aspects such age, gender, country, and departments/faculty are substantially no – or just a very little – impacting on the likelihood to appreciate ICTs in learning experiences.

Therefore, we can affirm that the fourth hypothesis, strongly supported by a greater part of the literature shown in chapter three – namely: *ICTs predilection in learning contexts can be explained/predicted thanks to demographic variables* – is falsified.

7.2.5: Fifth hypothesis: LoDE request more ICTs in formal learning

Hypotheses' exploration is providing, so far, a picture in which LoDE seem to be more cautious and moderate in adoption ICTs within their learning experiences than expected. But, it could be possible they are less digital-oriented because of environmental or contextual reasons; for instance: educational institutions do not push enough for a proper exploitation of ICTs, or professors prefer a different style for their instructional design, a style that does not integrate ICTs (analog-oriented?). Moreover, it is reasonable to assume that in a learning context structured around digital media, learners would use in deeper and proper ways ICTs for their studies' needs.

Therefore, the investigation was oriented to check if LoDE request for more ICTs in formal learning experiences.

It was important to pose a question which could overcome/avoid the predetermination of results or a naive/simplistic approach – i.e.: "do you want more ICTs in learning?", whose answer can not help to be "why not?". The methodological choice was to address the issue indirectly, inquiring which aspects of a learning tool are motivating to adopt it in learning experiences (question 8.3).

Additionally, the investigation specifically focused on mobile learning. According to the paradigm of *new media education* (Ardizzone, 2007), four key-dimensions (re)shape nowadays ICTs' adoption and usages: portability, personalization, multitasking, and media production. At the epistemological level, it means that both technological and appropriation trends are supposed to be highly influenced by those aspects; in our research, it pushes to strategically inquire if digital media, which are expected to be more appreciated overall, are relevant in learning. Therefore we focused on mobile.

So, using mobile devices with learning purposes was considered a consistent discover-key/litmus-paper to infer the learners' attitude towards the ask for more ICTs.

Tab. 51: 5th hypothesis

Hypothesis	LoDE request more ICTs in formal learning

Indicators - Measurable aspects	Question about what makes an ICT attractive to be used in learning	Deepening on mobile learning
Issues explored	a. Which aspects of digital technologies have a relevance in learning choices	b. In particular, is mobile learning considered strategic by university students?
Tool details	q.8.3	q.6.2, 5.4,8.3.f

7.2.5.1: Details of questions to verify/falsify the hypothesis

Which aspects of digital technologies have a relevance in learning choices

*Question 8.3*presented a grid where respondents had to express the level of relevance (very important, important, not so important, not important at all) of the following features of a learning tool, to motivate the adoption: Easy to learn/use, Opportunity to interact with other people, Possibility to share documents, Possibility to study/work at distance, Easy to access, Possibility to use it with the mobile phone.

Is mobile learning considered strategic by university students?

*Question 4.1*has been already described above (subpar. 7.2.1.1).

7.2.5.2: Results

Which aspects of digital technologies have a relevance in learning choices

Question 8.3's descriptive analysis does not depict LoDE as strongly willing to digitalize their learning experiences. Indeed, even if it is possible to adopt tools defined by portability, personalization, multitasking, and media production, the great majority of respondents focus on easiness; in details, easiness "of access" is very important for 76,7% of the sample, and easiness "of use" is very important for 68,4%. The picture below shows that also "possibility to study/work at distance" and " possibility to share documents" are relevant features for more than half of the sample. The interaction is the second last criterion (very important for just 43,8%), though there is a prevalence of positive attitude. The only feature scoring badly is "possibility to use it with mobile phone", which is not important at all for three respondents out of ten.

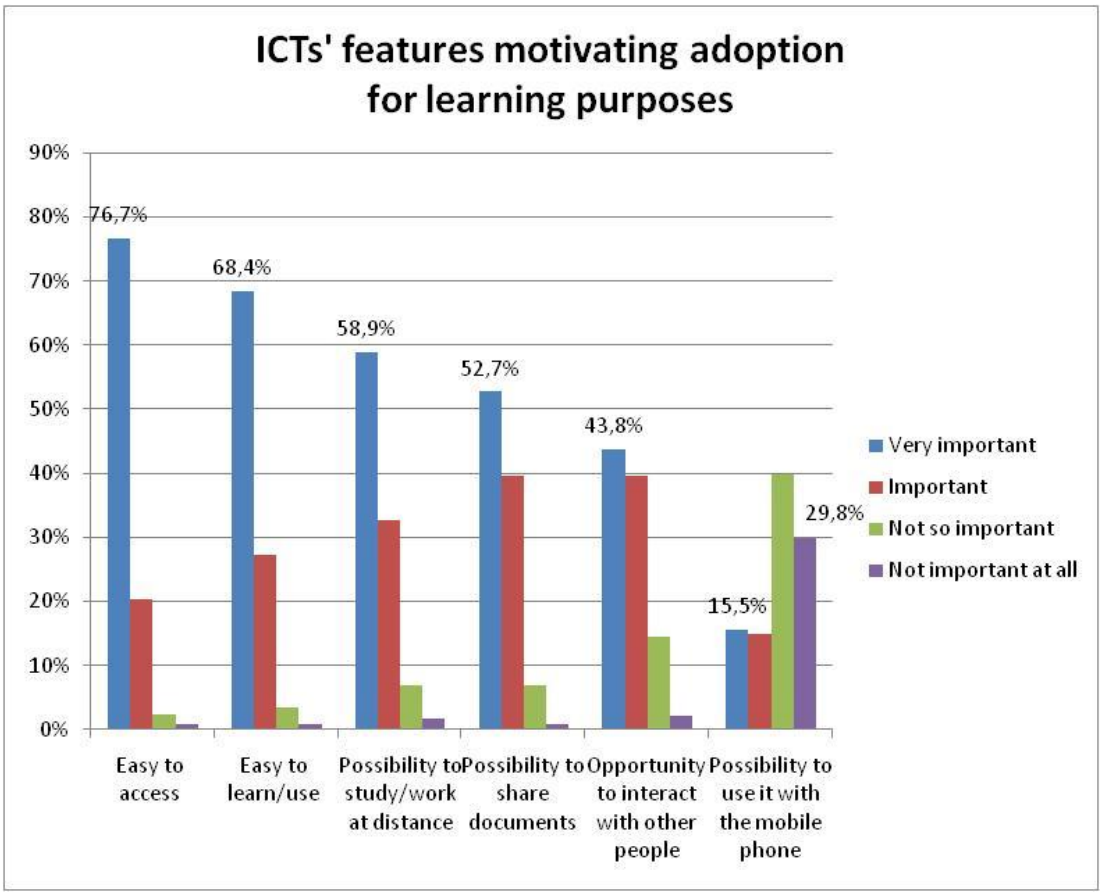


Fig. 68: ICTs' features motivating adoption for learning purposes (q.8.3) -total 484 (78 missing); data expressed in %

Since the result about mobile is a clear counter-trend compared to all the expectations above LoDE, and the only item with a negative prevalence, it is necessary to deepen this topic.

Is mobile learning considered strategic by university students?

In order to better understand and contextualize the answers to Item "f" of *Question 8.3* it is necessary to compare results of questions 5.4 ("preferred technology to interact") and 6.2 ("communication tools preferred in studies"); keeping in mind that 76,6% of respondents think that ICTs improved significantly the way they collaborate (question 4.4, subpar.7.2.2.2).

According to Fig. 66 – "preferred ICTs for collaboration", about q.5.4 (see par.7.2.2.2) – "Mobile phone" is used to collaborate for learning purposes by 75,0% of respondents. Moreover, among the first five preferred communication tools (q 6.2), there are three features which are, nowadays, comfortably available throughout almost all "smart-phones", I-Phones, I-Pad, Blackberry, and similar; as shown by the following table.

Tab. 52: communication tools preferred in studies
(q.6.2) - multiple answers allowed; total 510 (52missing); data expressed in frequencies and in %

Communication tools preferred in studies	frequencies	**%**
E-mail	435	85,3%
Instant messaging	254	49,8%
Wikis	176	34,5%
Social networks	174	34,1%
Forum	115	22,5%
Chat	91	17,8%
Video sharing (e.g. YouTube)	71	13,9%
Collaborative documents editing (e.g. Google Docs)	60	11,8%
Blogs	45	8,8%
Photo sharing (e.g. Flickr)	31	6,1%
Music sharing	29	5,7%
Documents warehousing (e.g. Box.net, Dropbox, etc.)	28	5,5%
Microblogging (e.g. Twitter)	11	2,2%
Social bookmarking (e.g. Del.icio.us)	4	0,8%
3D Virtual community (e.g. Second Life)	0	0,0%

Given the data shown so far and coherently to expectations on LoDE, the possibility to use mobile tools for learning should receive an high ranking. But, results from 8.3.f

(possibility to use a learning tool via mobile phone) illustrate a significantly different attitude toward mobile devices in learning.

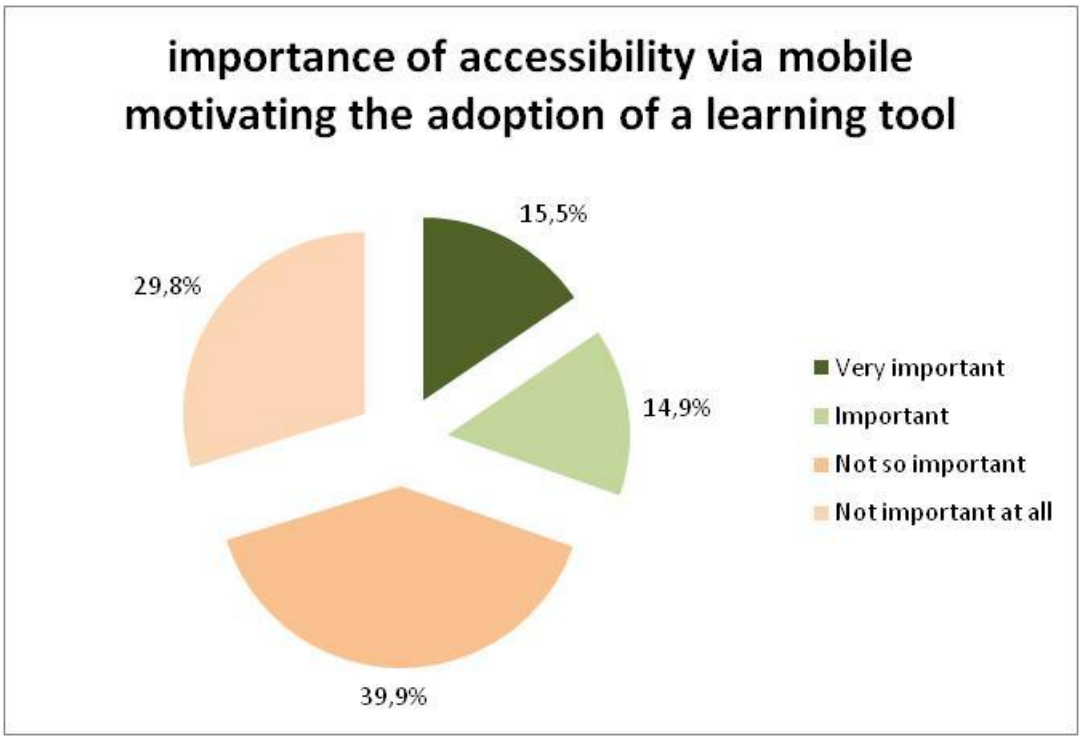


Fig. 69: importance of accessibility via mobile to motivate the adoption of a learning tool (q.8.3.f) -total 484 (78 missing); data expressed in %

According to the sum of negative results, about seven persons out of ten are not oriented toward the use of mobile in learning. LoDE involved in our research do not seem ready – nor interested – for a massive adoption of mobile learning.

7.2.5.3: Summary of conclusions for this hypothesis

The expectation behind the hypothesis is not confirmed. Our data do not show a cohort of learners keen to have more ICTs in their formal experiences of learning, despite usages of digital tools is massive.

In synthesis, it does not seem consistent to affirm that *LoDE request more ICTs in formal learning*: if considering attitudes towards adoption of mobile tools in learning, only 15,5% of our sample consider it very important.

7.2.6: Sixth hypothesis: eLearning is the preferred way to learn

This hypothesis is, somehow, related to what was partially explored in paragraph 7.2.3 with the second hypothesis about the relevance and the impact of digital experiences for learning; nevertheless getting a complete picture of LoDE attitude towards ICTs in learning is necessary, in particular in terms of eLearning.

Tab. 53: 6th hypothesis

Hypothesis	eLearning is the preferred way to learn
Indicators - Measurable aspects	Investigation of eLearning perception
Issues explored	eLearning appreciation
Tool details	Question 8.1

As shown in chapter 3, literature is divided, claiming on one side that "digital natives are born to learn digitally"; opposed to the other side, where scholars remarks learning is an anthropological irreducible, disconnected from digital vogues.

Trying to overcome ideological oppositions, we asked LoDE how do they conceive eLearning: a mature approach emerges: they declare to be eLearning-competent and familiar; though they are far to be addicted to digital.

7.2.6.1: Details of questions to verify/falsify the hypothesis

*Question 8.1*has been described in paragraph 7.2.4.1.

7.2.6.2: Results

The table below shows the results about the perception of eLearning expressed by LoDE.

Tab. 54: eLearning perception
(q.8.1); total 491 (69 missing); data expressed in %

Please indicate whether you agree or disagree with each of the following statements	Agree	Partially agree	Disagree
eLearning is an important element of my courses	51.0 %	38.6 %	10.3 %
eLearning is one of a number of important components of my courses	43.2 %	43.6 %	13.2 %
eLearning makes learning easier for me	26.9 %	47.9 %	25.2 %
It would be good if there were more eLearning in my courses	22.1 %	43.4 %	34.5 %
eLearning makes courses more enjoyable	21.7 %	43.8 %	34.5 %
My university is not very smart in the way it uses eLearning	10.1 %	29.5 %	60.3 %
With eLearning I interact more with other students	9.7 %	29.5 %	60.7 %
Without eLearning I would be unable to study	7.0 %	32.2 %	60.7 %
Having access to a computer connected to the internet is a problem for me	1.9 %	4.3 %	93.8 %
I find difficult to use technological devices	1.2 %	6.8 %	91.9 %
I find difficult to use a computer	1.0 %	5.8 %	93.2 %

Four pieces of information stand clearly out:

- as highlighted in green, great majority (more than 9 out of 10) of people in our sample declare themselves to be enough skilled and equipped to access eLearning;
- as highlighted in pink, they are moderate appreciators of eLearning. In details, 47,9% of respondents partially agree in considering that eLearning makes learning

easier; 43,8%partially agree that it makes courses more enjoyable; and 43,4% of LoDE in our sample partially agree in wanting more eLearning;

- as highlighted in light violet, about 3 people out of 5 disagree about the possibility to interact more thanks to eLearning;
- finally, as highlighted in light blue, slightly more than half of the sample (51,0%) consider eLearning important, and just 43,2% that it is one of a number of important components of their courses.

Additionally, a little group of devotees to eLearning (7,0%, in yellow) emerges. They agree in considering that they could not study without eLearning.

Socio-demographic analysis narrowed on these individuals (in frequency: 34) shows that age and country variables have, somehow, a role, even if not statistically pointed out from crosstabs presented in paragraph 7.2.4. In details: 55,9% of people responding they can not study without eLearning are younger than 23; and 47,1% of them are from Switzerland.

Furthermore, it must be observed that also being student at USI-COM impacts on results (11 people), since it has to be noticed that this is the faculty where the LMS Moodle is more diffused. A reasonable inference is that people tend to appreciate eLearning according to how familiar are with it.

Remarkably, though, there are respondents “finding difficult to use a computer” .In detail, we see that 5 people answered “agree”, – all of which were female,3 were younger than 23, and 2 were older than 30 – and 28 people answered “partially agree”. This can be considered like the last tail of digital divide at the HEI level. It is important for our research, because this data contributes to make the sample solid and consistent.

7.2.6.3: Summary of conclusions for this hypothesis

The hypothesis *eLearning is the preferred way to learn* is not verified: despite LoDE self-declare to be skilled and equipped for eLearning, rankings of eLearning appreciation are substantially low. People seem to be moderate in considering eLearning as factor of easiness or enjoyment in learning. It must be reported that just 22,1% of people agree

with the statement that “it would be good if there were more eLearning”, versus 34,5% disagreeing.

7.2.7: Seventh hypothesis: LoDE express a learning-style pattern digitally oriented

The last hypothesis, in a sense, re-comprehend all the previous six ones posing the key question about the learning-style.

Two issues define the hypothesis:

- an overall observation of impact of digital familiarity over learning style indicators, putting together results from different hypotheses;
- a well-directed inquire about the preferred strategy to learn.

Tab. 55: 7th hypothesis

Hypothesis	LoDE express a learning-style pattern digitally oriented	
Indicators - Measurable aspects	Questions about preferences of ICTs in learning	
Issues explored	a. Impact of digital familiarity in LoDE learning-style	b. Preferred strategies to learn
Tool details	q.4.4 vs 5.3, 5.1 vs 5.2, 5.4 vs 8.3	q.5.2

7.2.7.1: Details of questions to verify/falsify the hypothesis

*Questions 4.4, 5.1, 5.2, 5.3*have been described in paragraph 7.2.2.2.

*Question 8.3*has been described in paragraph 7.2.5.2.

7.2.7.2: Results

Impact of digital familiarity on LoDE learning-style

An overall observation of results shows a picture of LoDE which, somehow, seems to be contradictory: they declare to be massive ICTs users, but, in average, they master an elementary or medium level of ability with media – as seen in paragraph 7.2.3;

furthermore, they want to have ICTs at hand, though new technologies do not stand as fulcrum in any aspect related to digital learning (as discussed in chapter 1).

In facts, pairing some results we see that:

- for 76,6%of respondents ICTs changed the way they share and collaborate; but only 22,1% of people in the sample consider strategic to choose a partner skilled in media usages to collaborate with (question 4.4 versus 5.3).
- they prefer to learn in places digitally-equipped, though the favourite strategy to learn is the lecture in classroom for 94,1% (question 5.1 versus 5.2).
- they are massive users of communication tools allowing mobile learning, but the fact of being mobile to motivate a specific tool adoption in learning is relevant for 15,5% of respondents (question 5.4 versus 8.3).

In sum, the concept of people smartly dealing with media convergence seems to be more explanatory than the idea of digital learners. The picture emerging from data depict learners who know how ICTs can be useful in learning, nevertheless the focus and the preference remain on “analog” experiences.

Preferred strategies to learn

At the end, *Question 5.2*’s descriptive analysis shows, beyond any rhetoric, that LoDE do not express a learning-style pattern digitally oriented. The next figure puts in evidence answers to the question “which is your favoured strategy to learn?”; in order to better represent LoDE feeling, “a lot” and “fairly” are merged, as well as “a little” and “not at all”.

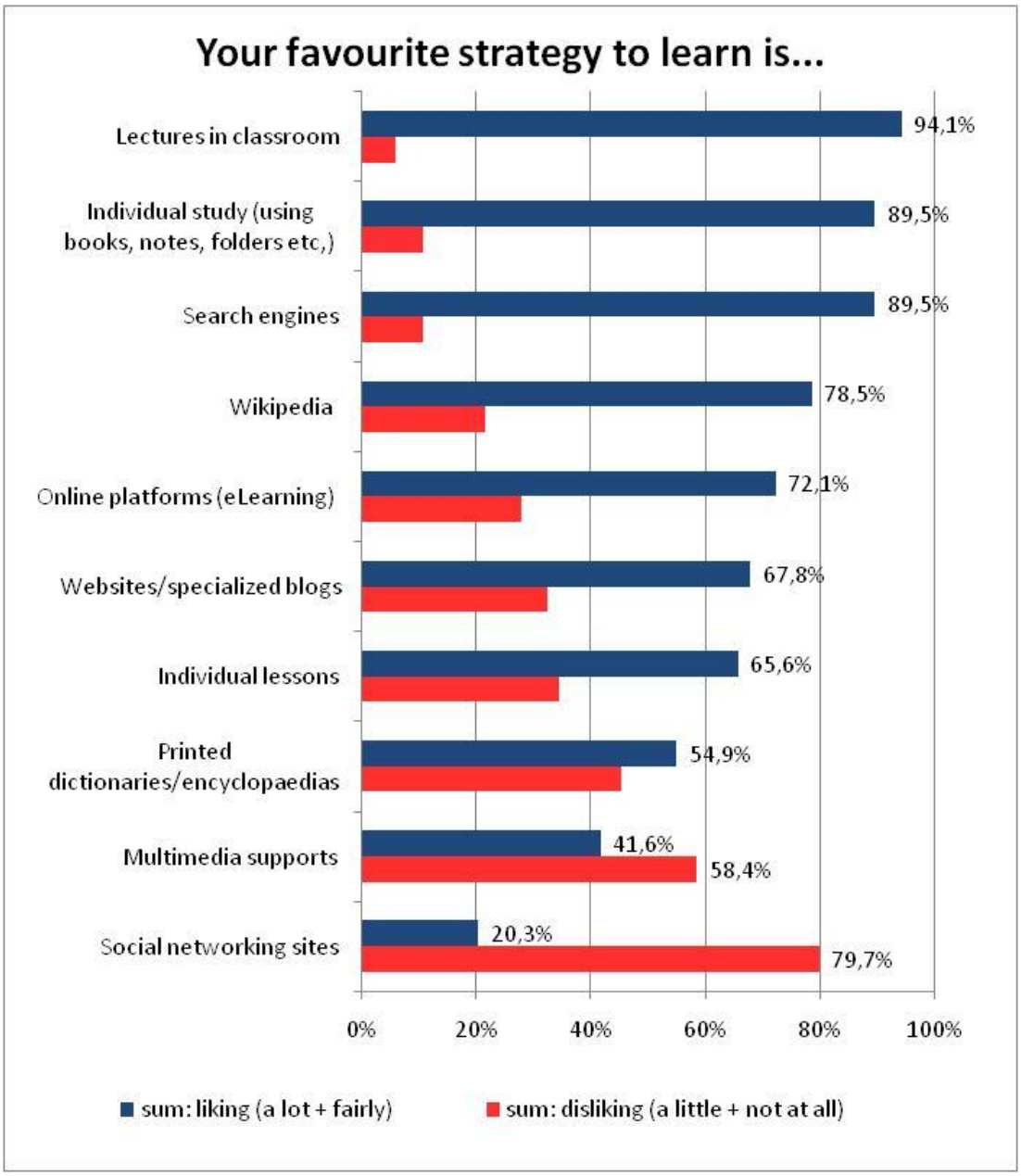


Fig. 70: the favourite strategies to learn (q.5.2) - total 512 (50 missing); data expressed in %

The most important piece of information outstanding from such results is that LoDE do express a clear preference towards a "classical" way to learn, despite they live in a digitalized context of learning. About 9 people out of 10 like the most "lectures in classroom", "individual study", and "search engines" to learn.

If looking only at “a lot” answers, the picture does not dramatically change: at first place there are “search engines” (57,2%), followed by “lectures in classroom” (52,3%) and “individual study” (50,8%); all the other choices are substantially preferred by less than half of the sample. LoDE, according to such data, are likely to be more analog-styled than digital-styled in learning behaviours.

Likewise, at the bottom of the list we find “multimedia supports” and “social networking sites”, here “not at all” is preferred by 48,0% of respondents; such a rejection of social networks weakens the expectation of a learning transfer from informal to formal learning experiences. An important reflection must be done about the rankings of search engines versus printed dictionaries and encyclopaedias: it seems that “Google & co” (Battelle, 2006) have stolen the place of the latter, reasonably because of convenience in terms of speed and cheapness.

An in-depth analysis based on socio-demographic aspects is necessary. Gender, faculties/departments, and countries seem not to play a diriment role. For what concerns age groups, the following results have to be taken into account:

- “Lectures in classroom” are preferred more by the older group, as 70,8% of them like this strategy “a lot”.
- “Individual lessons” are more popular among the older group: 41,7% of “a lot” answers, versus the 26,5% of 17-23; concerning this strategy, among the younger group there is the higher ranking of “not at all” (30,5%).
- The older group appreciate dictionaries and encyclopaedias more than the younger one: summing “a lot” and “fairly” we have 76,4% versus 51,0% of the younger class.
- Interestingly, concerning “search engines” only in 17-23 group there is a percentage (2,6%) who does not appreciate at all, and people older than 30 are the higher appreciators (“a lot”: 63,9%)
- “Wikipedia”, “specialized websites/weblogs”, and “social networking websites” do not reveal significant differences.

So, in general, older people are more likely to appreciate more traditional methods such as classroom lessons, individual lessons, individual study, the latter also liked by the youngest group. However over 30 people are great appreciators of eLearning; furthermore, they declare to prefer both printed dictionaries and search engines. As if to say, it is very uncertain to infer patterns explicable thanks to age variable.

7.2.7.3: Summary of conclusions for this hypothesis

The hypothesis *LoDE express a learning-style pattern digitally oriented* is falsified by our results. Nowadays learners seem more to be great appreciators than massive users of ICTs in learning; data show they want to have at hand all the possibilities/tools/facilities to learn, then they compose their learning paths, which are surely digitally-enhanced, but rarely digitally-centred. Such results substantially give an evidence-base to what Buckingham states in "Deconstructing digital natives":

> The history of technology suggests that change, however rapid, is generally incremental, rather than revolutionary. [...] Technologies have possibilities and limitations (or "affordances"), but they do not produce social change in themselves (Buckingham, 2011).

In conclusion, it is important to remark that the most liked strategy to learn (by 94,1%) is lecture in classroom, even though we are in the digital age.

7.3: Answering open questions

The long journey throughout the seven hypotheses has resolved some of the nodes, but has opened more questions. Some hypotheses have verified expectations of LoDE as "digital learners", some others have been falsified.

The data discussed so far reveal that learners of digital era are more complex than one would think, and that the impact of digital experience on learning is much more nuanced and ethereal. That's why it is necessary to analyze the issues that remain open with a qualitative approach. Not to respond in a unique and unmistakable way, rather than to interpret a reality that still eludes us.

At the end, we are immersed in digital technologies as a fish is immersed in water. History teaches us the difference between accurate data – which could, and should, be analytical objective – and their meaning – outcomes of a process of interpretation and signification, which, necessarily, reshapes and cuts data in narrowed synthetic pictures.

An anecdote might be helpful to understand such process, which is strictly connected to what said in chapter three about the power of rhetorical artefacts. Everybody knows that the storming of the *Bastille* occurred in Paris on the morning of 14 July 1789, and – symbolically – this date is reported as the starting point for the French Revolution; though, that day, the king *Louis XVI* wrote in his diary *rien* (nothing), meaning that nothing significant had happened or who deserved to be remembered (the fact was regarded as one of the many, so frequent, riots in Paris).

Moreover, in human and social sciences excessive confidence in numbers can be misleading.

The four open questions leading the qualitative part of the research are the following:

1. How do LoDE perceive their media diet, and how does it influence learning behaviours?

2. Which is the relevance of digital technology in informal learning via digital devices?

3. Is it observable a skill transfer from informal contexts of learning to formal ones?

4. Are LoDE bearer of a peculiar technological potential?

To answer the first question, data coming from media diet diaries are the most useful, while outputs coming from LEGO sessions are used to address the other three questions. See paragraph 6.6.2 for a description of the methodologies, and paragraph 6.7 and annexes for the complete qualitative dataset.

7.3.1: First open question: which is the perception LoDE have of their media diet, and how does it influence learning behaviours?

Thanks to results presented so far, we know that – at least for the people in our sample – the familiarity with new tools is not in doubt for LoDE. In the quantitative part, we have analyzed their media diet, described which ICTs are part of everyday life, how often, for what purposes, and compared different usages. Statistical treatment of data, mainly discussed in paragraph 7.2.1, put in evidence that people in our sample are great adopters of digital technologies for goals such as communication and gathering information. Furthermore, we observed a moderate use of ICTs for learning purposes; either in terms of quantity of use and in terms of how much advanced such uses are. Remarkably, from the data does not emerge a generation of technology-addicted learners; rather LoDE seem to prefer to have at hand the most of tools and means (old and new, classical and digital) possible, and then to customize their own tailored learning experience. Finally, we could say we face a generation of sage and average-skilled adopter of technologies, rather than a cohort of geek, or dramatic innovators.

It is now time to explore such issue from qualitative viewpoint, in order to listen to learners' voices, evaluating how do they perceive their media usages, how much they are aware of the role of digital technologies in their life, and – critical for the scope of this dissertation – how do they perceive the relationship between ICTs and learning.

Tab. 56: 1st open question

Open question	Which is the perception LoDE have of their media diet, and how does it influence learning behaviours?	
Strategy of inquire	Media diet diaries + discussions in class with participants	
Issues explored	a. Daily media diet	b. Weekly media diet
Tool details	Detailed self-compiled diary + transcriptions of discussions + students' reports	Synthetic diary (using pictures) + transcriptions of discussions + students' reports

Most of information about this open question, comes from the discussions held in class with participants, meant to comment diaries' contents. In the following paragraphs all the quotations come from the transcriptions of discussions – marked with (T), as said in par.6.7 – or from the reports (prepared by students of the class of "New Media in Education") – identifiable by a (R).

In particular, a new sub-topic emerged, namely the difficulty in narrowing what might be considered relevant for learning within the "digital" everyday experience.

7.3.1.1: "What is 'digital'?"

Above all, it must be reported a great difficulty to identify what an ICT is; adjectives such as "digital" and "new" are not enough to narrow on a defined list of objects/experiences. Participants reported a feeling of confusion and uncertainty about this point, fluctuating from the consideration that even a pen is a technology, to the idea that only the newest gadgets can be considered in a research about the impact of digital experiences. This is well-expressed by the following two comments:

> "Pushing the reasoning at the extreme, every action with ICTs is somehow learning, since it is not natural and need a training"(T: M.M., male, 25 years old)

> “A media diet properly focused on formal learning can not use device more advanced than computers, all the other cases are uncertain”(T: S.C., female, 26 years old)

Three key-aspects constitute the core perception of what an ICT is: being accessible via computers, being connectable to the internet, being mobile or – at least – not being tied by space and time constraints.

Though, in the discussion everybody felt stuck in the middle about how to categorise “sliding doors”. A taste of the dispute about this topic is interesting:

- They are digital.
- But they work in a very simple way.
- Not really, they need a computer to work and an electronic eye.
- Yeah, but there is no “information” nor “communication” in this technology. Skype is an ICT...
- Not at all! Doors receive inputs, then open or close. This is communication.
- Ok, but you can't compare that to an IPhone.”(T: class debate)

People reported that it is weird and uncomfortable – being a student in a Faculty of Communication Science – on one side, to realize how deep the permeation of ICTs in everyday life is, and, on the other side, not to feel at ease in defining/recognizing and categorizing such tools and means.

We can group their comments in the following four areas: impact of media diet on life in general, impact on leisure, impact on learning, and awareness issues.

7.3.1.2: Media diet impacting (social) life and overall perceptions

The voice of LoDE is particularly relevant about this point. The following list of comments come from the written reports students were asked to provide about their experience with media diet diaries. It is important to stress that some relevant

publications about this topic – expressing either enthusiasm, concerns and criticism – were submitted to students, in order to provoke motivated reasoning, to be paired with their impressions.

> 1. “the term ‘diet’ suggests a conscious and rational selection of doses of use of the new media, but what happens, in fact, is that we are completely submerged in a world where it is virtually impossible to get isolated from this exposure. Therefore, the definition of ‘media diet’ seems inadequate.” (R)
>
> 2. “Thanks to portable devices, you can not only integrate all the media in a single digital device, but also eliminate any “barrier” from the rest of the world, which seems virtually in your pocket.” (R)
>
> 3. “Nowadays, new technologies are ubiquitous, an so you are almost forced to a, sometimes unnecessary, overuse. In fact, it's an issue similar to eating problems. We tend to feel a sort of sense of dependency. Therefore we have to adopt a proper regimen, in order to avoid unregulated and unhealthy use, of which we are likely to become even victims. This is what happens in a diffuse way, for example with social networks like Facebook, [...]individuals can become addicted to the point of having to intervene drastically.” (R)
>
> 4. “The advent of new technologies have changed the ways in which people communicate with each other. That's why means of communication – such as chat, skype, phone calls, emails, messages through mobile phones, twitter, etc..–have dramatically increased. The fall of geographical and space-n-time barriers made us feel like we can contact any person in the world at any time. Not only, you can even follow the life

> of a person, even if you do not directly know them(eg Twitter).” (R)

It is important to underline that authors of the above statements are younger than 30 years old, and they are students who self-declare “digital natives”; interestingly, they express their intention to solve the gap between them and the “immigrants”.

Like a *fil rouge*, the most outstanding aspect concerns the attention devoted to well-balance their media consumption. In addition, it emerged that respondents were aware of the big communicational potentialities of new technologies.

7.3.1.3: Media diet impacting on leisure experiences

Despite leisure-purposes are very relevant for LoDE to adopt an ICT (see par.3.2.2.3), in our research this point has been underestimated by participants. In facts there is only one comment directly addressing this issue:

> “New technologies are almost completely replacing traditional media, for example, printed newspapers are largely supplanted by online ones.”(R)

This information is actually consistent throughout the whole dissertation: literature review informs us that new technologies are massively adopted for (almost any kind of) information gathering; quantitative results show that online newspapers are just behind the printed ones (see fig.57a, subpar. 7.2.1.2); and also the qualitative data confirms this trend.

7.3.1.4: Media diet impacting on learning experiences

Listening to the voice of learners about the impact of ICTs in their learning isvery helpful. All the conjectures, the concerns, the exaggerated expectations, and the utopian beliefs discussed in the chapter 3 are immediately scaled down.

LoDE in the qualitative part of LV@USI-SUPSI express the following feelings about the impact of media diet in learning:

1. “It is important to note that, in learning, technologies bring benefits only if certain conditions are met. Among these, a real involvement of the student, convenience in terms of time and productivity.”(R)

2. “The horizons of learning mediated by technologies have still to be explored. In fact, most young people still can not fully exploit the opportunities that the Internet offers in terms of training, such as learning foreign languages [...],and tend to use the network just as a socialization tool.”(R)

3. “It is important that teachers provide education on media to students [...] because technology accompanies young people everywhere, non only at home.”(R)

4. “It has also to be noticed that encyclopaedias and dictionaries online are accessed more over the network than on paper.”(R)

People in our sample declare, on average, to want to have more ICTs at hand, because this possibility could improve learning itself, and maybe it could provoke innovations. What deserves to be noted is the absence of extreme considerations: there are no techno-Luddites nor techno-utopians among the research participants. The approach to ICT is moderate: LoDE speak of potentialities to be developed, and conditions to be respected, in order to conceive ICTs as factors of changing in learning experiences.

7.3.1.5: How is the awareness of being in digital era reflected in learning experiences?

The last group of comments constitutes an unexpected output of the qualitative part. During the conversations with participants, the feeling of a sort of insight often emerged; the approach to life was defined by a student as “strongly un-aware about the media environment” (R.C., female, 24 years old). In general, the presence of ICTs in every aspects of life – then, in learning – was described as an environmental aspect you should make an effort of concentration to get it.

Such attitude is well reflected by the following statements:

1. “Often you can not help to use new technologies, since they have almost become a must our lives and are an integral part. Therefore we don't even realize when we use them, to the point of becoming passive users. [...] When you are at the supermarket checkout counter, at the time of payment the registration process of the goods by the bar codes is taken for granted.”(R)

2. “If we depict our everyday experience with media, it's like we live immersed in a world of hidden technology. We don't always even understand what processes are involved, even if we use them constantly. We [...] we have, for example, discussed about the technological nature of electronic faucets, sliding doors or automatic lights. [...] we suffer the pervasiveness of many hidden technologies impacting our everyday life, which we do not even notice.” (R)

3. [furthermore...] “we are entering the era of nanotechnology, and the nanotechnology is itself invisible to human eye, therefore it will become even more impossible to be aware of all the technologies that affect our daily lives.” (R)

4. “As per today, without new digital devices you are excluded from certain communities, and you feel isolated. [...] in a way, you depend on these technologies, if you want to form part of society. This lifestyle is imposed by the continuous development [...and] the intensive use of new technologies. Therefore, each user feels the need to ‘stay tuned’ with society’s trends.” (R)

5. “The ‘dependency’ created by new technologies causes people can't do without them. Just think of, for example, a

college student who, for a whole day, does not have internet access." (R)

The above comments put in evidence the efforts to move a step back from everyday experience, aiming to understand processes implying technology. The discourse is strictly linked to learning in a twofold sense: first, growing in awareness is one of the everlasting goals of education; second, recognizing an implicit ability with technologies is the primary step for the transfer of skills from formal experiences with ICTs to a conscious adoption for learning purposes.

7.3.2: Second open question: Which is the relevance of digital experiences for learning?

LEGO sessions results will be used to answer this second open question, especially observing and inquiring the chosen keywords. As pointed out in paragraph 6.6.2.1.2, the following six criteria of analysis constitute the whole protocol of analysis:

a. Cognitive-linguistic analysis on the chosen keywords.
b. Inquire of the domains (e.g.: actions; concepts, metaphors, feelings, tools, ICTs, etc) expressed in the overall corpus of keywords.
c. Overall summary of elements.
d. Spatial analysis of elements in the landscape.
e. Analysis of the participants' reciprocal influence; this criterion works to weigh the importance of a repeated metaphor/building.
f. Comparison of artefacts on the continuum abstraction-analogy.

The first three ones are discussed here below.

Tab. 57: 2nd open question

Open question	Which is the relevance of digital experiences for learning?
Strategy of inquire	Self-projection methods (using metaphors) + shared analysis of results
Issues explored	Self-representations between media and learning
Tool details	Analysis of keywords used to define artefacts

As said in the methodological chapter, the added value of a LEGO session (if compared, for example, to an interview) is the elaboration of meaning in a group dynamic. This point is very relevant, because of the impressive role played by discussion and comparison with other people. When reasoning about the relationship between media and learning, if the person is in a circumstance where the exchange of ideas is supported, much more concepts and links come to his/her mind. So, the level of self-reflection and self-awareness is greater, deeper, and broader. Moreover, the game stimulates both rational and emotional thinking. In a word, the number and quality of inputs enable a stronger analytical process. When a question is asked to the interviewee, s/he has just a little time to provide the answer, while if s/he has the time to play and to elaborate the answer within the game, and s/he can exploit mates' intuitions, much more data are available to him/her. The process to attribute a keyword to the built artefact is very important; it forces people to focus and narrow on what is really relevant about that topic.

Concerning this second section of the qualitative part, in order to answer to the question "Which is the relevance of digital experiences in informal learning via digital devices?", we will observe in details all the keywords used by participants; then the domains (e.g.: actions; concepts, metaphors, feelings, tools, ICTs, etc)of the keywords will be inquired; finally an overall summary of elements will be offered, all together and split in communication sciences/informatics.

7.3.2.1: Cognitive-linguistic analysis on the chosen keywords

Even if a LEGO session is organized by steps, the analysis of keywords is run over all the session, since it is conceived to be a unique experience of collaborative reflection and construction of meaning.

Eight participants at the LEGO session at communication sciences built – in three steps – 24 artefacts, choosing 19 keywords, namely the following ones.

Tab. 58: LEGO session at communication sciences – table of keywords

1st step: Build yourself using ICTs	**2nd step:** Build your favourite /most used ICTs	**3rd step:** Build your favourite technology to learn
communication	cellphone (4 times)	classical lesson (2 times)
daily life	Ipod	book
driving	laptop	computer (2 times)
fast-switching	meeting/gathering engine	lecture in classroom
socialization vs isolation - because of the internet	threshing machine	oral explanation
the centre of the world		technological hand
water		
a window		

Eleven participants at the LEGO session at the faculty of informatics built – in two steps – 22 artefacts, choosing 21 keywords, namely the following ones.

Tab. 59: LEGO session at informatics – table of keywords

1st step: Build yourself using ICTs	**3rd step:** Build your favourite technology to learn
access	Abstraction
communication	Explore
concentration	Inspiration
dreams	Observation
future	reading (media convergence)
games	reading (treasure)
homesick	search engines
mobilization	Searching
night-work	team work
service	Thinking
slavery	WWW

The first aspect to be noticed, in the cognitive-linguistic choice, is the general direction of keywords; as if to say: which is the mood of the group around the dichotomy media and learning? Such data inform us about what is the effective feeling about the influence and the role of ICTs, either in life and in learning.

The communication sciences group expresses a self-representation between media and learning in which it is strongly clear the role of ICTs in reshaping and resizing experiences of:

- Communication (communication, cellphone x4, a window);
- Time (daily life, fast-switching);
- Projection in social activities (socialization vs isolation, the centre of the world, meeting/gathering engine).

While the keywords chosen by the second group reveal a marked opposition around the interpretations of the digital permeation in everyday life:

- On one side ICTs are interpreted like a chance: to improve life, to become richer, to make dreams come true, to enjoy, to learn better, etc (dreams, future, games, homesick, mobilization, service, treasure, inspiration);
- On the other side, for people using computer daily, digital technology is almost a death sentence (night-work, slavery).

Moreover, it is interesting to note that no one labelled his/her artefact as “computer”.

7.3.2.2: Inquire of the domains expressed in the overall corpus of keywords– Overall summary of elements

Another important analysis to be run concerns the linguistic domains, namely which keywords relate to actions, or abstract concepts /metaphors, or feelings; which are ICTs, or other strategies emerging when reflecting around learning and media. This aspect is useful to explicitly reveal the LoDE attitude towards ICTs in learning. The following table provides such a picture.

Tab. 60: inquire of the domains expressed in the overall corpus of keywords

Domains	Communication sciences		Informatics		Total
Actions			Access, explore, searching, observation, abstraction, thinking, games	7	7
Concepts / Metaphors	Centre of the world, a window, multitasking, daily life, communication, threshing machine, electronic hand, driving, meeting / gathering engine, water	10	Inspiration, future, communication, service, mobilization, night-work, concentration, dreams	8	18
Feelings	Socialization / isolation	1	Homesick, slavery	2	3
ICTs	Cellphone (x4), computer (x2), laptop, IPod	8	WWW, Search engine	2	10
Other strategies	Classical lesson (x2), lecture in classroom, book, oral explanation	5	Reading (x2), teamwork	3	8
		24		22	46

The above picture puts in evidence five important aspects:

First, 18 keywords out of 46 are abstract concepts or metaphors, and this is absolutely consistent with LEGO session's dynamics. Playing with LEGO gave people the possibility to invent, to interpret, to synthesize, to elaborate an original meaning about their experience between media and learning. During the conversations, many students reported this activity as a stimulating point for a stream of consciousness about the debated issues.

Second, ICTs are relevant for LoDE (10 keywords). In addition, it has to be highlighted that there is a great convergence on cellphones, computers, and the internet for

gathering information. Only one label out of the total is about a “new” gadget (such IPod).

Third, the importance of classical strategies to learn is undeniable as well: 8 people chose labels such as “classical lesson” or “reading”. LoDE confirm to be sage learners, not *à la page* ones: certain aspects of classical learning are not replaceable.

Fourth, the cloud of 7 actions expressed by informaticians (compared to no one from the first session) reveals an “explorer” mindset, which seems to be very coherent to the idea of knowledge cabled in the digital era.

Fifth, even if the points in common are very little, they are highly significant. Above all, there is the “communication” keyword, used by both groups. Furthermore, there is a parallelism between “cellphone” and “mobilization”; as well as between “meeting/gathering engine” and “search engine”/”searching”. This strongly confirms the idea that the only unquestionable, proofed, and self-recognized impact of ICTs in LoDE lives is about communication and information gathering.

7.3.3:Third open question: Is it observable a skill transfer from informal contexts of learning to formal ones?

The strategy of data examination applied to this open question is, probably, the most challenging presented in this dissertation. In order to explore whether it is observable a skill transfer from informal experiences with ICTs to formal ones, a logic-spatial analysis of elements on the shared landscape will be stressed. The fact participants were asked to place their artefacts on a table, dividing them between “leisure” and “learning” constitutes the core of such exploration. Indeed, it is a completely unpublished and unexplored way to analyse this topic.

Tab. 61: 3rd open question

Open question	Is it observable a skill transfer from informal contexts of learning to formal ones?
Strategy of inquire	Self-projection methods (using metaphors) + shared analysis of results
Issues explored	Relationship between leisure and learning when using/adopting ICTs
Tool details	Logic-spatial analysis of elements on the shared landscape

Four questions define the path of observation, namely:

1. How many artefacts are placed in the "leisure" area? How many in the "learning" one?
2. How many artefacts are placed across the splitting line?
3. Which are the connected artefacts?
4. Where are the ICTs?

7.3.3.1: Logic-spatial analysis of elements in the landscape

In order to make the logic-spatial analysis easier, it is useful to observe the two synthetic landscapes paired.

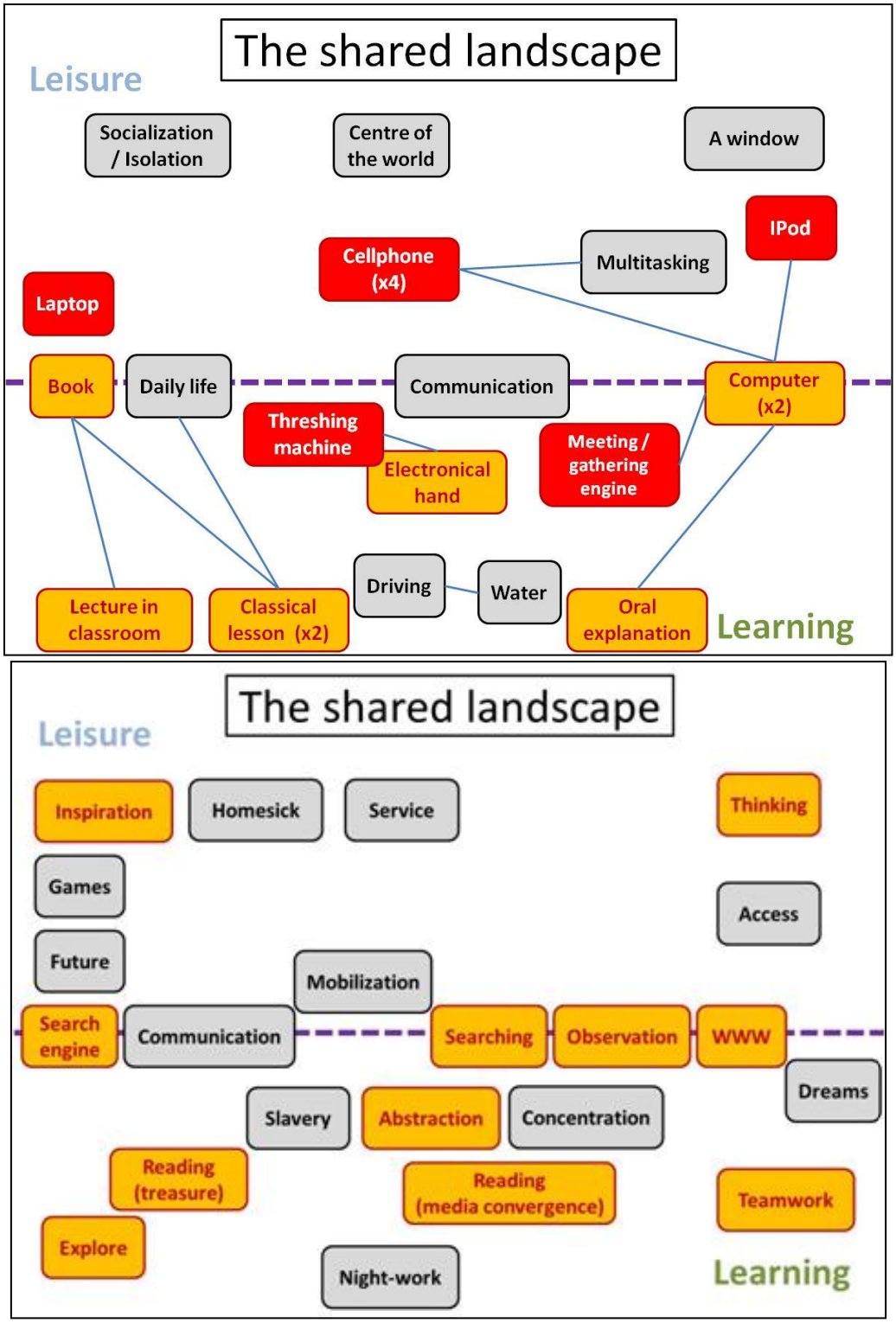


Fig. 71: the two synthetic landscape paired

It has to be cleared that the above pictures constitute an abstract conceptualization of a broader and deeper process; nevertheless, they are very useful to enter the learning cultures expressed by LoDE participating our research.

How many artefacts are placed in the "leisure" area? And in the "learning" one?

Answering this question means dealing with a complex and multi-step process of analysis/synthesis made by each individual, which had to be negotiated with other participants. Clearly, the artefact – placed on the shared landscape after a discussion with mates about its correct positioning – implies much more significance than the one initially attributed by the builder. Thanks to such observation, we can comprehend which kind of balance there is between the two areas.

The next table answers this question, and the following one.

Tab. 62: breakdown comparison of artefacts' palcement in the shared landscapes

	Communication sciences				**Informatics**			**TOTAL**
Step / **Area**	You using ICTs	Favourite / most used ICT	Tech. to learn	*partial*	You using ICTs	Tech. to learn	*partial*	
Leisure	4	6		*10*	6	2	*8*	*18*
Splitting line	2		3	*5*	1	4	*5*	*10*
Learning	2	2	5	*9*	4	5	*9*	*18*

As the table shows, merging results from communication sciences and informatics people, there is a sort of balance between leisure and learning. This is a very important clue about the attitude declared by LoDE towards the dichotomy learning and media. It informs us that the global representation they have about the presence of ICTs in their lives is, again, moderate and wisdom-oriented. Such output frees – if necessary – the discourse from any exaggeration: the experience with digital is permeating, in parallel, with a similar strength, either free time and study. In the subsequent text we will discuss how this permeation is happening, and its effective impact on learning attitudes.

Observing more in details the comparison table, it emerges that informaticians express a more open mindset: artefacts representing technologies devoted to learning populate also the leisure part of shared landscape.

How many artefacts are placed across the splitting line?

This question is the very diriment point of analysis about the issue discussed in this paragraph: “Is it observable a skill transfer from informal contexts of learning to formal ones?”.

Actually, what people put in the middle of the landscape constitute the most important concepts and interpretations about the relevance of ICTs for their learning needs. And the artefacts put upon the splitting line are even more relevant, because they represent the “bridges” between the use of digital technologies in leisure and learning. In other words, the familiarity with digital devices in free time can become an aware mastering of skill customizable for education if there is a relationship between the two areas; furthermore, this relationship must involve experiences referring to both areas in a bi-reciprocal dimension. For example, if the use of cellphone is massive but disconnected from what is relevant for me to learn, it is hazardous to claim I am ready for mobile learning; on the other hand, if computer is part of my media diet in a good balance between leisure and learning purposes, it is reasonable to use as a lever to improve my learning with more digital practices.

Concerning the above issue, what emerges from the table is a potentiality of skill transfer, rather than a real evidence of it. In particular, informaticians seem to be slightly more inclined to mix up learning and leisure: among 11 artefacts representing technologies to learn, 4 are on the splitting line; versus 3 out of 8 in the other group.

Which are the connected artefacts? (applicable only for LEGO session at communication sciences)

The second very useful strategy to understand if a skill transfer is observable, or – at least – plausible, is the number of connections linking the different artefacts. Unfortunately we had the possibility to run this step only during LEGO session at communication sciences.

Tab. 63:connections among artefacts - LEGO session at communication sciences

Nr. of connections	Artefact
4	Computer
2	Cellphone
2	Book
2	Classical lesson
1	IPod
1	Multitasking
1	Meeting / gathering engine
1	Oral explanation
1	Electronic hand
1	Threshing machine
1	Daily life
1	Lecture in classroom

Relevantly, ICTs play a bigger role: 7 connections imply digital devices; while 6 refer to classical strategies to learn. This allows to interpret that the presence of digital technologies in LoDE experiences is important; not only in quantitative terms, as demonstrated with questionnaire results, but also qualitatively; this means that the skill transfer is likely to develop. In order to understand if it already exists or if it still has to come, the last question about logic-spatial analysis id fundamental.

Where are the ICTs?

So far, we have seen LoDE are likely to extend their familiarity with ICTs in leisure time into learning context, because both LEGO session show ICTs are relevant in a co-construction of meaning about the dichotomy learning and media. To realize if – for people participating in our research – this is a potentiality or a reality, we need to observe where the artefacts reproducing ICTs are placed.

The logic-spatial analysis shows that:

- For what concerns Com-Arch-Eco group, there is a dramatic unbalance: 6 artefacts representing ICTs are placed in leisure area (cellphone x4, laptop, IPod), and 2 on the splitting line (computer x2).
- Informaticians put 3 LEGO models reproducing digital technologies – all related to the internet – on the splitting line (search engine, searching, www).

- Such results reveal we can not conclude the skill transfer already exists, in facts a "bridge" role is unquestionable, though – especially if observing the first LEGO session – learning area is massively populated by artefacts referring to "classical strategies to learn (such as: reading, teamwork, lecture in classroom, or oral explanation).

7.3.4: Fourth open question: Are LoDE bearer of a peculiar technological potential?

The very last point investigated in this dissertation concerns the idea of "technological potential" or "media skill" (for a discussion of the term, see Schulmeister, 2008) LoDE are said to bear by some scholars. We will focus specifically on the third step of LEGO session "build your favourite technology to learn", grouping artefacts by domains discussed in 7.2.3.2. and showing "classical strategies" versus "ICTs". In the text we will use pictures – and not just labels – because of their iconic/symbolic value, which can be stronger and richer than a synthetic keyword.

Tab. 64: 4th open question

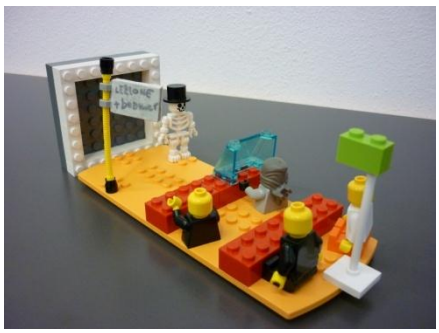
Open question	Are LoDE bearer of a peculiar technological potential useful for learning purposes?
Strategy of inquire	Self-projection methods (using metaphors) + shared analysis of results
Issues explored	Representations of technologies used in learning
Tool details	Focus on 3rd step of LEGO session

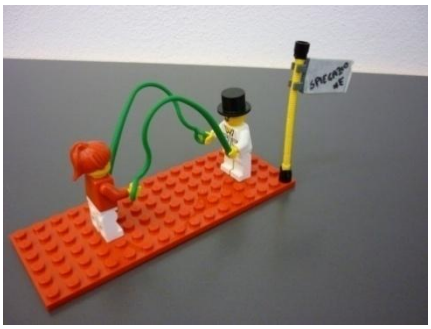
7.3.4.1: Classical strategies vs digital technologies

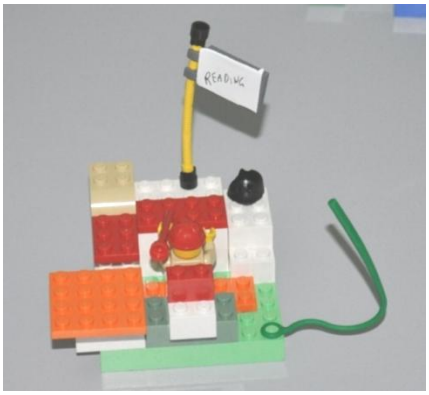
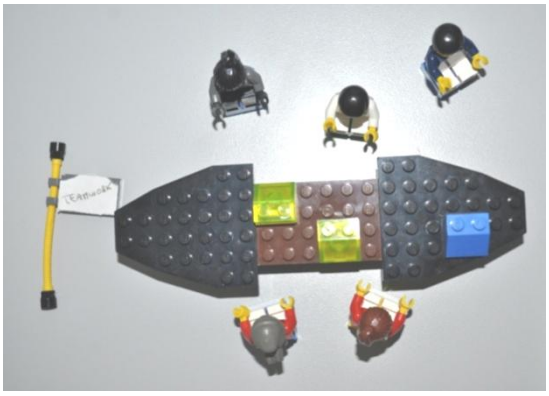
The following two slideshows are meant to underline that LoDE participating in our research do not seem to bear a specific learning skill sprouting out from digital familiarity. We draw such consideration from: the numerical prevalence of "classical" strategies over ICTs; the importance attributed to the social aspects of learning process (emerging from 5 out of 8 artefacts referring to "classical" strategies); and to the, all in all, simple picture emerging from the adoption of digital technologies in learning, in a world full of media and enriched and empowered by devices and facilities, LoDE direct towards computers and internet (to search data).

It is important to remark that such interpretation is strongly confirmed by statistical results of the question "which is your favourite strategy to learn" (subpar. 7.2.7.2).

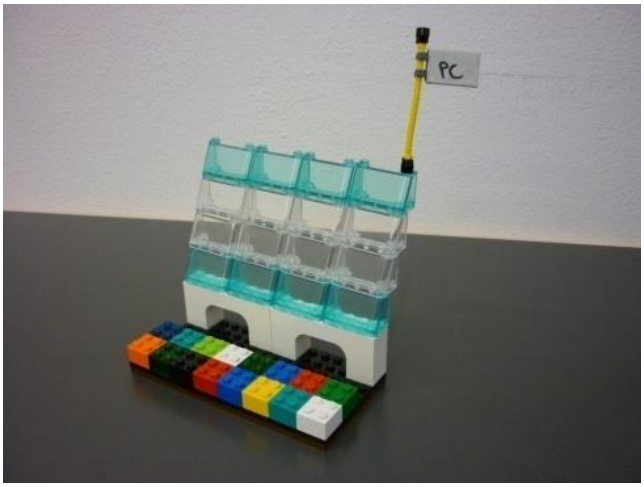
Tab. 65:"classical strategies" chosen as "the technology you prefer to learn"

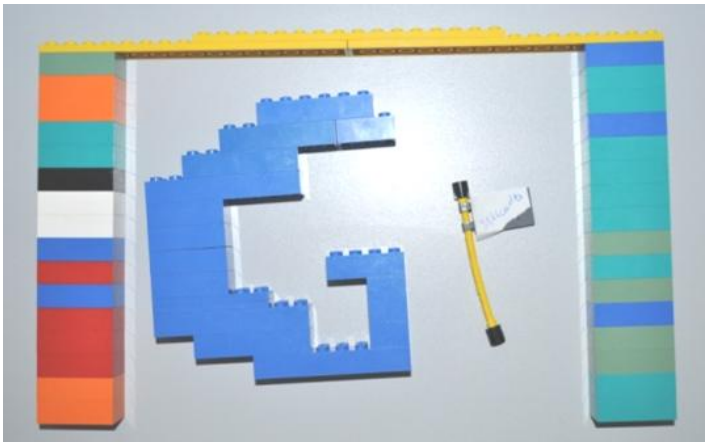
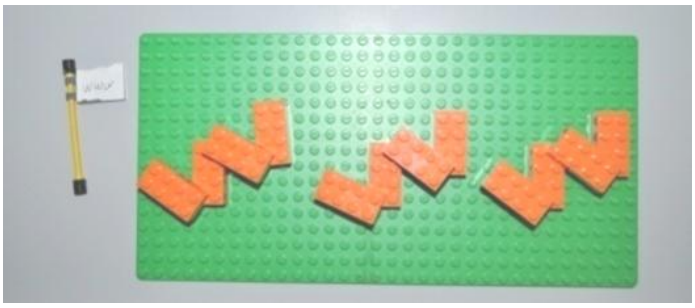
Communication sciences	
Lecture in classroom	
Classical lesson	
Classical lesson	
	➔ *The table continues*

Oral explanation	
Book	
	➔ *The table continues*

Informatics	
Reading	
Reading	
Teamwork	

Tab. 66: “ICTs” chosen as “the technology you prefer to learn”

Communication sciences	
Computer	
Computer	
	➔ *The table continues*

Informatics	
Search engine	
Searching	
www	

Observing all together the above pictures and concluding, it is useful to come back to the concept of “media convergence” (see par. 2.2.2.2). Actually, such idea seems to be significantly more tailored and suited for LoDE rather than the expectation of a specific “technological potential”. Since our goal was to listen to the learners’ voices, we can conclude borrowing from one of our participants the following sentence – which is likely to be the clearer definition of “media convergence” :

> Reading means: having a book on the desk and a marker in my hand, checking on the net what I do not know, using the phone when a I need help, printing materials which are useful for me.

7.4: Dealing with complexity: combining quantitative and qualitative

In order to help the reader in reframing this long chapter in some key-points, before drawing the conclusions of the dissertation, we will offer a schematic vision of results presented in chapter 7. The schemas reproduce the combination of hypotheses and open questions.

What we would like to emphasize is not to consider the following as a melting of data but rather a juxtaposition of research processes.

7.4.1: Verified and falsified hypotheses

Tab. 67: verified and falsified hypotheses

Hypotheses	Results
1. The presence of ICTs in LoDE experience is massive	Verified.
2. ICTs' usages are more related to leisure purposes than to learning ones	Only partially verified.
3. ICTs' adoption for learning goals is statistically relevant only for elementary learning behaviours	*Abandoned – lack of diriment results* → *3B*
3B. eLearning appreciation is explainable thanks to advanced practices with ICTs.	A little statistical relation was registered, butin a such little dimension to be not relevant
4. ICTs predilection in learning contexts is explainable/predictable thanks to a. Age variable b. Country of origin c. Gender d. Field of studies	Falsified. The influence of socio-demographics is almost negligible: too little or not existing.
5. LoDE request for more ICTs in formal learning	The assumption behind the hypothesis is not confirmed.
6. eLearning is the preferred way to learn	Not verified.
7. LoDE express a learning-style pattern digitally oriented	Falsified.

7.4.2: Answers to open research questions

Tab. 68: answers to open research questions

Open questions	Answers
1. Which is the perception LoDE have of their media diet, and how does it influence learning behaviours?	LoDE seem to be still in approaching phase to a learning behaviour digitally-oriented. On one side they are great adopter of ICTs, but on the other they are not very aware of the permeation of media in their lives.
2. Which is the relevance of digital experiences for learning?	We could synthesize with the expression: a lot of expectations and some concerns. LoDE do a sage/reasoned usage of ICTs in learning. Mainly they stress communication and information gathering.
3. Is it observable a skill transfer from informal contexts of learning to formal ones?	No. Or, at least, not yet. But it is true that we can observe premises allowing this skill transfer to develop. Indeed, as per today, ICTs seem to play an "alongside" role – rather than a "bridge" one – between activities of leisure and learning.
4. Are LoDE bearer of a peculiar technological potential?	Not really. They are manifestly familiar but no substantial revolutions in learning styles are observable.

CONCLUSIONS

This chapter starts with a sum-up of the conceptual journey leading the thesis; it presents the six key messages coming out from the research work.

Paragraph 8.1 offers the big picture about what we have put in evidence in this dissertation; paragraph 8.1.1 comes back to the theoretical part of the dissertation, while 8.1.2 is a review of the results exposed in the empirical part.

Paragraph 8.2 discusses the usefulness of this dissertation. Three "circles of reflection" are targeted: local (Ticino-Switzerland) stakeholders; practitioners and educators in the fields of eLearning and Media Education; pedagogists and scholars reflecting on education and new media in the 21st century.

Then, a re-presentation of research limits is debated in 8.3.

In paragraph 8.4 there are my final remarks about the topic "the challenge is adopting paradigms while avoiding stereotypes at the same time".

The above issues have been presented and discussed in the following papers (co)authored by Emanuele Rapetti:

- OECD-CERI. (2012). Connected minds: Technology and today's learners. Paris: OECD-CERI (Centre for Educational Research and Innovation).
- Rapetti, E. & Cantoni, L. (2009), Nativi digitali e apprendimento con le ICT. La ricerca GenY@work in Ticino, Svizzera, *SI-eL conference proceedings*, September 16-18, Salerno, Italy.
- Rapetti, E., Ciannamea, S., Cantoni, L. & Tardini, S. (2010). The voice of learners to understand ICTs usages in learning experiences: A quanti-qualitative research project in Ticino (Switzerland). *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010* (pp.2527-2536). Toronto, Canada.
- Rapetti, E. & Marshall, S. (2010). Getting over the "generation Y" perspective: Observing ICTs in learners' experiences around the world. *QWERTY Journal of Technology, Culture, and Education, 5* (2 - Special Issue on "Generation Y, Digital Learners and Other Dangerous Things"), pp.58-85.
- Rapetti, E., Vannini, S. & Picco, A. (2011). Is mobile learning a resource in higher education? data-evidence from an empirical research in Ticino (Switzerland). *Je-LKs, Journal of eLearning and Knowledge Society-English Version, 7*(2), pp.47-57. Retrieved from: http://je-lks.maieutiche.economia.unitn.it/index.php/Je-LKS_EN/article/viewFile/520/526.
- Rapetti, E. & Cantoni, L. (2012-forthcoming), Reconsidering "GenY" & Co: from minding the gap to overcoming it, In *Proceedings of the international EDEN conference "Open Learning Generation"*, Oporto, Portugal.

From a long journey, six key-messages

The journey we have subtitled "From the analysis of dominant reflections to an empirical study emphasizing the learners' perspective" is coming to its end. The most important points we can get are reflections which may inspire our understanding of education and new media.

I must admit that, being born in 1982 and having a good attitude towards digital devices, I was fashioned by the idea of being a *digital native*, or a member of the *generation Y.* At a first sight, that was an intriguing explanation of a very complex reality. Then, listening to concerned voices about ICTs' bad effects in the life of young people, I had to admit that I was a privileged (even if, maybe, a little bit of "internet addiction" could be put on my medical record). But, approaching the texts written by the critics one, I realized also that the existence of a *generation of digital learners* was an oversimplification. Honestly speaking, it seemed that all the three views on the topic concealed a bit of authenticity, nevertheless none of them was exhaustive. So, what is an academic topic became, somehow, also a research on myself and my cohort cultural identity; since all the discussants were not part of the *digital generation.*

So, I can draw six key-messages; three negative and three positive ones. For all the cases, it is possible to find many references supporting such statements; in the following text you can find the ones stressing them in the most clear way.

Six key-messages

☒ No predominance of technology in education

Neil Postman, in *The end of education* (1995), already put in light that there is an overestimation of the importance of technology, when reflecting about education:

> In considering how to conduct the schooling of our young, adults have two problems to solve. One is an engineering problem; the other, a metaphysical one. The engineering problem, as all such problems are, is essentially technical. It is the problem of the means by which the young will become learned. It addresses the issues of where and when things will be done, and, of course, how learning is supposed to occur. [...] But it is important to keep in mind that **the engineering of learning is** very often puffed up, **assigned an importance it does not deserve** (p.23).

Learners' voices at USI-SUPSI confirmed that assumption.

Of course students like to have more technology at hand, but that is not their focus.

In facts, they are highly in favour of classical ways to learn (as quantitatively confirmed by the questionnaires' results. See tab.67) since their more frequent (and efficient)learning experiences take place via face-to-face didactic. If the eLearning platform does not work, they are disappointed but if the course is weak they are significantly more critic (as emerged during one discussion commenting LEGO sessions).

☒ Socio-demographic variables are not unequivocal to explain ICTs adoption in education

Data from quantitative part of our research do not show any strong and univocal relation between age, gender, country of origin, and/or field of study variables and a declared ICTs-attitude in learning. As expected, students of our sample are great users of new technologies; nevertheless they are not really conscious of the permeation of media in their everyday life, and just some of them can be considered advanced users.

On this purpose, Bullen and colleagues (2009)report – as relevant theme coming out from their studies – the "limited toolkit" issue:

> Despite a vast availability of institutionally supported and freely available (web 2.0) tools, the student 'toolkit' was surprisingly limited. Student use of technology could be distinguished as belonging to one of two sets: general communication tools, and program specific technical tools, [...]such as AutoCAD (p.7).

According to these authors, three drivers lead the choice of a new technology in educational experiences: familiarity, low cost, and immediacy. As if to say that young people are very less digital than expected, when learning.

☒ **Labels can be catchy, but are not so useful in education**

The recent book *Deconstructing digital natives* (Thomas, 2011)clarifies this point, in an excerpt, which summarizes the entire publication:

> The digital natives argument [...] overstates the difference between generations, and understates the diversity within them. Many so-called digital natives are no more intensive users of digital media than many so-called digital immigrants. There are by no means as technologically fixated or as technologically proficient as is often assumed. They don't necessarily have the skills, the competency or the natural fluency they are assumed to possess. Much of young people's use of digital technology is mundane rather than spectacular: it is characterized not by dramatic manifestations of innovation and creativity, but by relatively routine forms of communication and information retrieval. Contemporary children have many of the same interests, concerns, and preoccupations as children in previous generations -even if the way they manifest these through their use of technology are likely to be rather different. (p.x)

Nevertheless, in the text it is also written that:

> If – despite its shortcomings – the "Digital Natives" debate has provoked [...] international collaboration and discussion, then it may well have been worthwhile. (p.xi)

In the same text, the smart inventor of digital natives wrote:

> Of course dividing human beings into only two groups is a huge generalization. Even dividing people into "men" and "women" leaves out all sort of categories. But we do it, often, to make, or highlight, useful points. (p.16)

Marc Prensky states also that ICTs can make people "truly wiser", and – in order to go beyond the counter-position natives/immigrants – he suggests the new label *Homo Sapiens Digital.*

☑ The importance of communication in using media

Communication studies provide an important piece of knowledge which is confirmed by our results: as expected, tools and facilities related to communication are widespread diffused and adopted by LoDE (it is enough to remember that 78,1% of our sample email everyday).

In the so-called Knowledge Society the widespread presence of media is continuously impacting our lives, and, as a consequence, our communication experiences in learning contexts: who lives and grows up in this environment is familiar with such dynamics, and is likely to develop abilities related to the management of communication via ICTs. Indeed, communication and education are fused together in any learning experiences involving ICTs (Jacquinot, 2000; Cantoni 2006).

In short. LoDE are primarily (contents-)communicators.

☑ The importance of search in using media with learning-purposes

Only one thing is more frequent than communicational activities: using search engine, done everyday by 79,3% of respondents.

It has been observed that media – especially ICTs – are powerful "integrated components" in processes of elaboration of culture and civilization (Ceretti, 2007); search engines are particularly relevant in this analysis because they make extremely

more complex and extremely more rapid access to any cultural contents, linking potentially everything (Battelle, 2005).

If the prevalence of search engines is a quite well-known and explored phenomenon, the consequent – complex – open question is about how this impacts learning habits and skills. It is reasonable to conclude that there is an attitude towards a massive usages of "Google & co", to seek information. Nonetheless, there is not enough evidence whether such familiarity provokes a correspondent learning ability; especially for what concerns the processes of critical choice and critical analysis, leading from information to knowledge (Pedró, 2009).

According to our results, LoDE are largely (information-)searchers.

☑ The importance of eLearning as a context and as a strategy

Pairing results from LV@USI-SUPSI and GenY@work (Rapetti & Cantoni, 2010) it is possible to draw important conclusions about the nature of eLearning for LoDE.

The first one is that no simple direct eLearning recipes can be derived; the reality is too many-sided to allow unique or universal solutions.

The second is that eLearning must be conceived either as a context – every learning in the knowledge society deals somehow with that "e-" –, and/or as a strategy. In facts,

> To have more and better eLearning, we do not necessarily need more ICT, we need to be aware of their role in the overall living experience of learners and teachers (context), and to activate them if and when needed (strategy) (Cantoni, 2011).

So, LoDE are learners. Then, contextually, are eLearners; and, if strategically provoked, can be wise eLearners.

8.1: LoDE and ICTs, what the journey has put in evidence

This paragraph is devoted to present what this dissertation put in evidence, allowing to develop the above listed key-messages.

The theoretical part has put in light the incompleteness and (partial, but relevant) inconsistency within the literature, and calls for a reviewed, wiser, and more cautious perspective.

The empirical part has provided answers to the seven hypotheses and the four open questions inspired by the review of rhetorical artefacts and trends and structured in light of the adopted "LoDE perspective".

8.1.1: In the theoretical part of this dissertation

The first part of this dissertation was mainly composed of two axes of reflection: (i) the review of rhetorical artefacts and trends about the dichotomy "learners and new media"; and (ii) the work to build a solid theoretical framework, within which to collocate the debate, and from which to adopt a comprehensive perspective of analysis.

As said, the peculiarity of the analysed topic is the unbalance between the very huge amount of texts provided, and the (very much) lower number of empirical researches meant to check the theoretical assumptions. Moreover, to make matters even worse, we can register a (sometimes, even ideological) counter-position of contrasting voices.

Concerning the first issue, we abstracted three different views around the topic; from such whole we elaborated a taxonomy of analysis.

8.1.1.1: Many voices, three views

Before going back to the schematic presentation of the three views (discussed in details in chapter 3), it is necessary to repeat that this is just one possible trial to systematize a very big literature on the issue. The taxonomy is an artefact and an abstraction; 20 years of debate and thousands of publications are not reducible to only three words.

As said, the three views are a sort of compass to move within such a large and complex territory:

1. **Enthusiasts** (about the impact of ICTs on learners' skills and behaviours) are firmly convinced that digital technologies are making the generation of young learners a very skilled one. Within them it is possible to further distinguish three different approaches, depending on the observed area of ICTs' effects on learners behaviours and attitudes:
   a. The *historic-sociological approach,* stressing the differences between the current generation and the previous ones (e.g.: Howe & Strauss, 1991);
   b. The *psycho-cognitive approach,* claiming that everyday usages of ICTs have changed the cognitive abilities of young people (e.g.: Prensky, 2001);
   c. The *socio-pedagogical approach,* based on the paradox "everywhere ICTs, except at schools", asking for a reform/revolution in school and university systems (e.g.: Oblinger & Oblinger, 2005).
2. **Concerned ones** accept as well this idea of a digitalized generation of learners, but focus on the potential dangerous effects, such as violence, dumbness, harassment, addiction, etc.(e.g.: Bauerlein, 2008).
3. **Critics** question the idea of characterizing the set of skills of the young generation simply in function of ICTs' usages, criticizing overgeneralizations, and requesting deeper studies and localized analyses (e.g.: Bullen, Morgan & Qayyum, 2011).

8.1.1.2: LoDE perspective

Aiming to overcome bias involved by any of the above, it can be useful to face the issue with a fresh attitude. This is why, in our research, we opted for a new label and a comprehensive perspective: Learners of Digital Era (LoDE).

The chart flow presented in fig.27 (p.164) clarifies how characteristics, expectations, and assumptions attributed to the generation of digital learners are involved in the LoDE perspective.

What we would like to underline is that LoDE perspective:

- takes into account the review of rhetorical artefacts and trends, proposing a taxonomy to interpret it;
- is built on a solid pedagogically-build theoretical framework;
- aims to save anything is worthwhile.

It is necessary to promote the idea of innovating learning and teaching practices because children and adolescents master the use of their digital tools enhancing their access to sources of information. This does not mean at all to simply introduce new media in education, but rather to educate through new media. This is why a comprehensive perspective about current learners is useful and needed, as the first step to elaborate a shared and sound eDidactics (that is meaningful only when customized for accurate given contexts) based on the alliance between an educator pedagogically expert in knowledge and a more and more autonomous learners.

Summing up the key concepts promoted by the enthusiasts as a whole group, it seems that the claimed and needed revolution in pedagogy is mainly the call to emphasize and exploit the digital know-how of nowadays students.

The group we named *concerned ones* express a number of concerns, from social aspects to medical ones. For the scope of this dissertation, it is important to focus the attention on difficulties in teaching due to the distance between usages of ICTs in education and in leisure time; on issues related to the decline of attention; unbalancing between the easiness in information retrieval and the effort needed to achieve solid knowledge.

Thirdly, LoDE perspective is enriched by the fallacies in the assumptions about a digitalized generation of learners, highlighted by *critics*:

- Do not implement generational opposition;
- There is not enough scientific evidence to state a different brain functioning;
- Do not approach the topic with determinism or recipe-style;
- Do not offer worldwide generalization, especially if moving from the observation of local or regional trends;
- Do not take for unquestionable the stereotype of tech-savvy young people, since they use a lot ICTs but their technological skills seem to be limited;

- Consider that skills developed in informal experiences of learning (e.g.. online social networking) do not transfer easily to formal contexts.

Finally, the *logomachia* about current learners need to be overcome. “LoDE” can be an acceptable label in reason of the following key-points (see chapter 4 for a more detailed explanation):

- It is not age-based;
- it is not ICT-centred;
- it is not excluding any learners;
- it is not predicting or assuming any behaviours or characteristics;
- it puts the focus on learners;
- it underlines the importance of digital as a context factor.

8.1.1.3: A theoretical framework

A perspective of analysis is not enough to set a research.
The rationale behind the building of a theoretical framework comes from the remark of the lack of a proper pedagogical reflection, and of an instructional design enlightened by an eDidactics centred on learners educational-psychological needs (Schmoelz, Payrhuber, & Hahn, 2010).
The choice between ICT-centred or learner-centred instructional design is a matter of mindset. If the approach to this choice spouts out from the pre-cognition that they are *digital* learners, consequences are deduced in advance.
Our effort was to set up a conceptual structure which could comprehend the complexity involved in the dichotomy learners and new media, and which could lead to understand the role and the peculiarities of eLearners. Therefore, the analysis of relevant ideas was targeted at the crossing point among four different disciplines: communication sciences, pedagogy, sociology, anthropology. Sound currents of thought and inspiring thinkers were combined, trying to answer the crucial question “which idea of learner must inspire us and we have to promote, when we set and provide eLearning?”.

The theoretical framework resulting from this process can be schematically understood thanks to the following image; it shows the four disciplines converging in this dissertation, highlighting which are the relevant contributions (both theories and authors).

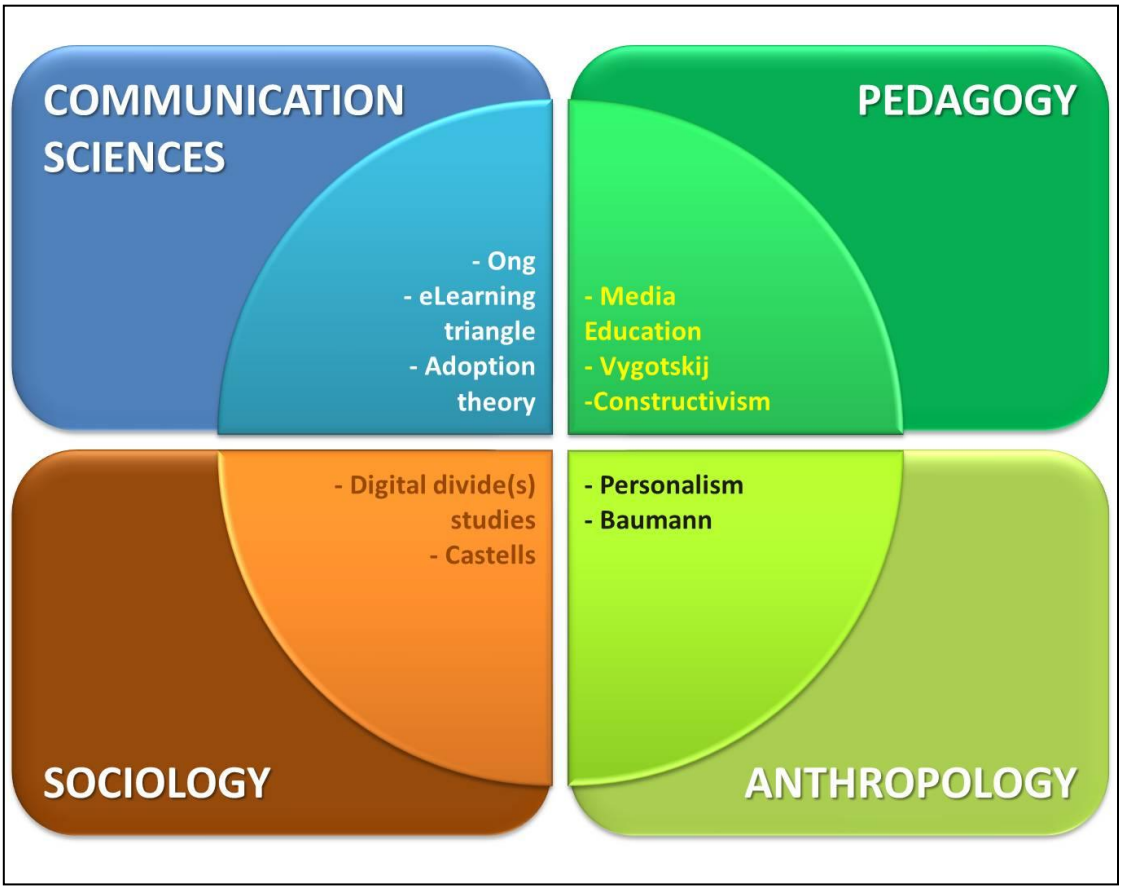


Fig. 72: interdisciplinary in this dissertation: involved scholars and currents of thought

Communication sciences teach us about the great novelties provoked by ICTs in communicational dynamics. New forms of orality and literacy are emerging. The speed of technology development, combined to the adoption theory, often contrasts with individuals processes of learning and appropriation. There is a unmissable balance between people, means, and contents of any communicational practice; especially when involving learning.

Such evidences have a great impact on how people live and – therefore – learn.

So, it is necessary to consider which modifications in society are registered. In particular, two social phenomena must be kept under track: the development of the network-styled logic, permeating any aspect of relationship, knowledge and power; and the existence of digital divides, splitting and promoting the digital-adapted over the others.

It is also necessary to explore what modifications in education are expected and verifiable. Media in education constitute the development of pedagogy, since the empowerment of didactic is unquestionable and learners can significantly improve and enlarge their area of development and knowledge. Nevertheless, it is fundamental to develop an idea of education which respects the anthropological condition of learner as person.

This is why we included the lessons of a philosopher of education – Jacques Maritain – and a philosopher of sociology – Zygmunt Baumann. The foundation of education is metaphysic and not technological. ICTs are instruments which need to be adopted to improve the human life (and not to liquefy their experiences and identities, till disappearing).

Given this articulated system of references – working as lighthouse during the navigation –,it has been possible to enter into the empirical part.

We opted to listen to learners' voices, mainly because of the fact that most of the reasoning around LoDE have been provided without interpellating them directly.

The challenge becomes, then, to be in line with the LoDE perspective, avoiding to simply include the ones who say what we want to listen, and to ask them the *answers* needed to demonstrate something.

Thanks to the review presented in chapter 3 we have put in evidence that the knowledge is still incomplete, even if the production of texts is massive.

Thanks to the theoretical framework we have set up a sound structure within which re-collocate and re-shape a proper debate around learners and new media in the third millennium

8.1.2: In the empirical part of this dissertation

From the review of rhetorical artefacts and trends, we inherited a very complex set of issues-to-be-explored. Our strategy was to split this complexity in seven hypotheses to be verified and four open questions to be addressed.

Subjects participating in Learners' voices @ USI-SUPSI were LoDE attending university institutions of Ticino (Switzerland); the final sample was composed by 562 respondents to the online questionnaire, and 27 active participants plus 19 observers/contributors (total: 46 people) to the qualitative phase; this second involved two LEGO sessions and three media diet diaries.

Results, discussed in details in chapter 7, do not allow a univocal interpretation of the reality.

LoDE certainly use intensively ICTs in everyday life, consequently also in learning practice. Nonetheless, data emerging from our research do not depict current university learners as particularly skilled exploiters of new technologies. Rather, the concept of "media convergence" (see par 2.2.2.2 for a description) appears to be the most consistent explanation of reality; learners adopt in studies the tools they already manage in their private life, and compose a learning-environment suitable to their needs. Such results are not influenced (neither positively nor negatively) by the fact of living in Switzerland – where there are almost no problems in accessing ICTs and university institutions promotes eLearning; results of a similar research (Learners' Voices at UWIOC) conducted at the Open Campus of the University of the West Indies confirm this attitude of "media convergence" (Rapetti & Marshall, 2010, p.125). Besides, if we compare ICTs used in learning by respondents in LV@USI-SUPSI and LV@UWIOC, it does not emerge any significant difference (see chapter 5.3). Being LoDE seems to be not a sufficient reason to fulfil learning with digital devices and online activities.

It must be underlined that, in particular, age-issues – and socio-demographic variables in general – do not provide unidirectional or resolving interpretations, despite they are the leading point behind the idea of a generation of digital learners. High familiarity with, and massive adoption of ICTs seem to be the unique universal traits attributable to LoDE. ICTs' familiarity explains LoDE learning behaviours more accurately than age

variable, as if to say that the massive exposure to digital devices must be considered like an environmental factor and not a direct cause (neither an effect) for ICTs predilection in learning.

The image emerging from such results suggests that LoDE do prefer a quite rich learning diet, encompassing both face to face, established media and new media; only encyclopaedias and dictionaries appear to be outdated, and clearly substituted by their online counterparts, which play a major role for (quick) information search and retrieval. A very little preference for educational usages of social networks suggests, moreover, that LoDE are not ready/interested in adopting such applications for their learning at the university, maybe keeping them just for informal learning (about this topic, see: Livingstone, 2001; Madge *et alii*, 2009).

In conclusion, such results suggest to deepen studies about the media convergence issue (Rivoltella, 2006). Learners of digital era seem to be larger than dominant/*à la page* descriptions about them. They are not ICTs-addicted, neither techno-luddites (Cantoni & Tardini, 2010); rather they arrange the best learning environment, adopting new and old media, in order to fit and respond to their educational needs and interests (Rapetti & Cantoni, 2012 forthcoming).

Such conclusion contrasts with the ones who claim that – even if you can not yet see them – people belonging to the digital generation of learners are coming. Actually, such approach is, in our understanding, too narrowed on ICTs' (expected) impact and too little focused on learners.

8.1.2.1: Synthesis of quantitative outputs and final comment about age variable

What expressed so far in this paragraph has been presented extensively in chapter 7. See tab.67. Results from the statistical data treatment of answers to the online questionnaire are divided into seven hypotheses. Even if LoDE experiences include a massive presence of ICTs – learners do not express a learning-style clearly digitally-oriented.

A final comment is needed about the age variable.

Crosstabs procedure was run for all possible crossings between items of questions 4.4 ("how much ICTs improved…?"), 5.2 ("Which is your favourite strategy to learn?"), 8.1 (do you agree with the following statements?"), and "age classes". In order to verify any statistical influence, 81 tabs were analysed applying Pearson's Chi-Square to check the assumed relationship; while to determine its nature Cramer's V value (converted in %) was used. Such a procedure makes it possible to answer the question: *does Age make any statistically relevant difference?* Out of 81 crossings, Pearson's values resulted significant in 8 cases, meaning "age classes" variable was proofed to have a statistical influence. Nonetheless, this influence is interesting only in two cases (highlighted in bold in the following three tables).

Tab. 69: crosstabs' synthetic results "age classes" * question 4.4

The fact of being older...	...increases of...	...the likelihood to consider that ICTs improved significantly...
	0,8%	"the way you practice your hobbies or interests"
	0,5%	"the way you do your students' tasks"
	0,1%	"the way you learn"
	3,9%	"the way you collaborate with your peer"

Tab. 70: crosstabs' synthetic results "age classes" * question 5.2

The fact of being older...	...increases of...	...the likelihood to be more in favour of...
	0,2%	"lectures in classroom"
	0,6%	"printed dictionary/encyclopaedia"
	0,3%	"online platforms (eLearning)"

Tab. 71: crosstabs' synthetic results "age classes" * question 8.1

The fact of being older...	...increases of...	...the likelihood to answer that...
	4,0%	"It would be good if there were more eLearning in my courses"

In conclusion, within the studied community of learners age does not matter at all, or explains very little, when it comes to preferences and beliefs connected with ICTs in learning, no gap exists between younger generations and their 30+ colleagues.

8.1.2.2: Rationales for methodological choices and synthesis of qualitative data

Setting up Learners' Voices @ USI-SUPSI we got some valuable hints about the requirement of a combination of qualitative and quantitative methods of inquire.
Opportunely, the following ones need to be mentioned, since they constitute also part of the reflections leading to conclusion. Furthermore, our methodological choice was to stress qualitative (quasi-ethnographic) data in all cases of conflicts or ambiguities emerging from quantitative. The four open questions descending from the wider research question about learners and new media have been addressed via two LEGO sessions and three media diet diaries.
Firstly, during discussions in classrooms (when commenting with students results of LEGO session),a clear lack of awareness – about the real effects of media in everyday life – was put in light.
Secondly, important voices from the literature in the field already had put in evidence problems which seemed not observable and understandable via statistics. In particular, the issue of "elementary usages" (Bullen *et al.*, 2009), the debated prevalence of leisure versus learning (Schulmeister, 2010), the problem of non-awareness (Bennett, Maton, & Kervin, 2008; CLEMI, 2003).
Thirdly, the complexity of relationship between variables defining knowledge society (Castells, 2000) and the consequent existence of LoDE can not be synthesized by numbers. One thing is to affirm that there are evidence proofs of the need for a numerical

improvement of teaching, another is to say that they are solvable with a digitalisation of learning simply in light of the fact that we live immersed in a digital environment (if we lived in an environment where everybody like to smoke, should we cigarette-orient our pedagogy?). ICTs have been invented by human beings to help other human beings, no one force us to conclude we have to subordinate pedagogy and anthropology to market rules about diffusion of technologies.

Fourthly, despite of its questionable consistency, the *digital native* label took place in our everyday discourses, permeated the press and the common diffused attitudes toward pedagogical reasoning around learners today. So, it was necessary to adopt tools that go beyond the stratification of common language.

Thanks to such a rich methodological choice, we obtained a solid and big dataset, which provides direct outcomes for the open questions; but which also makes possible to understand learning culture(s), and to find advices for instructional design and pedagogy. See tab.68for a synthetic view of the qualitative results.

One conclusive consideration: ICTs are important in LoDE experiences mainly for communication and information gathering. They are familiar with ICTs, but it is inappropriate to affirm that new technologies resolved their approach to education.

The primacy of Information and Communication technology seems to be more significantly related to broader aspects of life, which is transformed. As if to say that new media impact massively on LoDE lives, while they are moderately able to manage them. The following image returns the strength of this relationship between person and media: it was named by the author “the centre of the world”, and was built to represent “yourself using ICTs”.

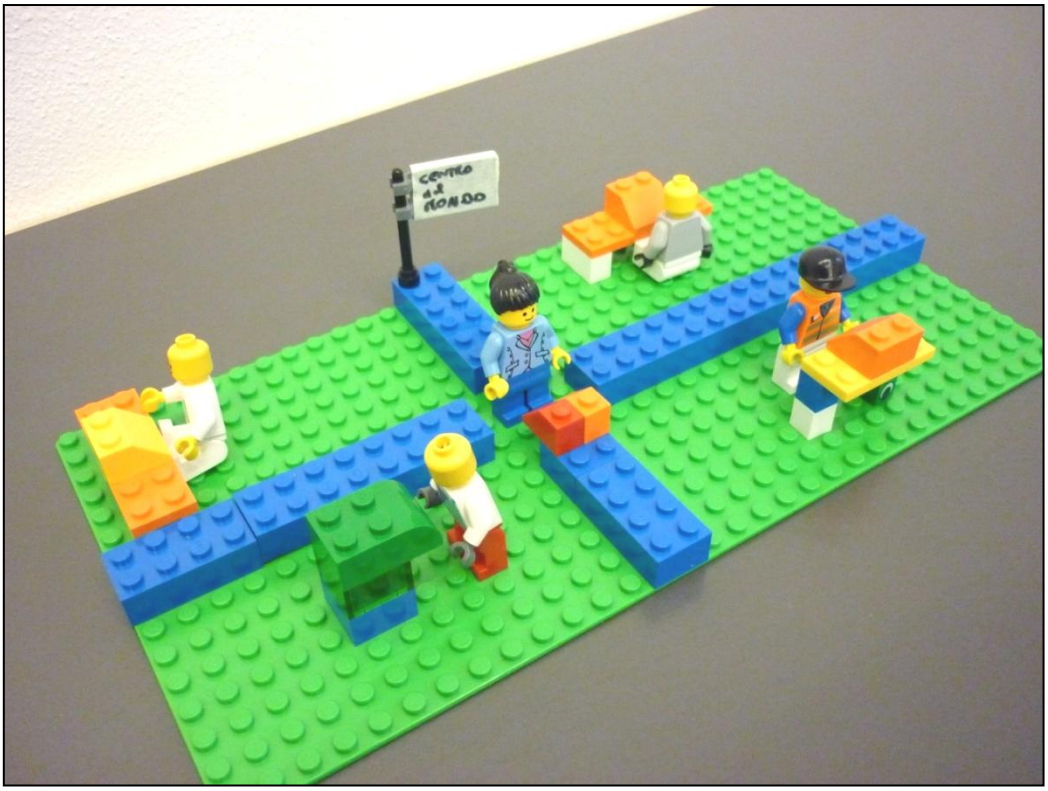


Fig. 73: "the centre of the world" (from "LEGO session @ Communication Sciences" dataset)

8.2: Usefulness of this dissertation. Three circles of reflections

LoDE perspective and results of Learners' Voices at USI-SUPSI research project can be useful in the following fields: in instructional design, in eDidactic, in educational public policy, in educational and anthropological reflection.

It is reasonable to determine three circles of reflection where this work may be of some use and relevance.

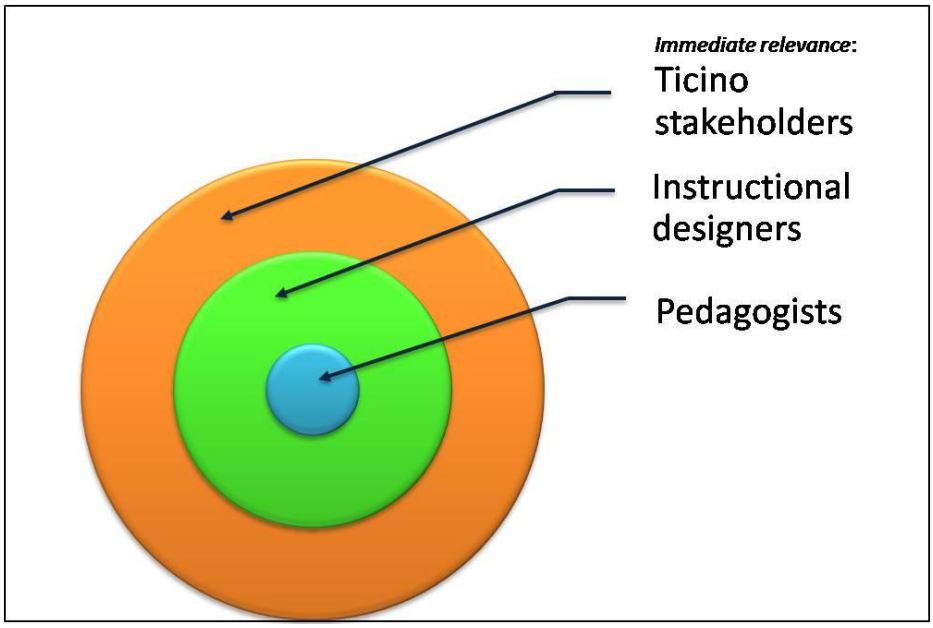


Fig. 74: relevance and (potential) usefulness of this dissertation

8.2.1: The immediate relevance (data-evidence and local implications)

The greater amount of information is likely to be relevant for Ticino stakeholders. Of course, involved Universities (Università della Svizzera italiana and Scuola Universitaria Professionale della Svizzera Italiana) can directly profit from data emerging from this research. But, even more important might be sharing this work with the territory institutions, in order to plan educational public policies coherent with the picture of higher education students and with the pedagogical conclusions we can draw from results.

Besides, university institutes can use data from Learners' voices @USI-SUPSI to collaborate with secondary schools in preparing *curricula* correspondent to the university level of ICTs usages.

On the other side, university students are asked to attain a certain level of mastering new technologies when they get a job. If we know how LoDE perceive and conceive the role of ICTs in their learning, we can deal with HR professionals in order to offer better training experiences. It must be cleared that the duty of university is not limited to the

technical training, but it has to be focused on transversal skills related to new media which can lead students to be wise citizens (see: Media Awareness Network, 2010).

Also local scientific committees and newspapers may take profit of this work. At least, to not fall into the trap to create some public action precisely targeted for "digital natives".

Some data are particularly outstanding for the abovementioned targets.

Firstly, from the analysis of attitudes towards eLearning (question 8.1 of the online questionnaire), four pieces of information stand clearly out:

1. great majority (more than 9 out of 10) of people in our sample declare themselves to be enough skilled and equipped to access eLearning;
2. they are moderate appreciators of eLearning. In details, 47,9% of respondents partially agree in considering eLearning makes learning easier; 43,8%partially agree to say it makes courses more enjoyable; and 43,4% of LoDE in our sample partially agree in wanting more eLearning;
3. about 3 people out of 5 disagree about the possibility to interact more thanks to eLearning;
4. finally, slightly more than half of the sample (51,0%) consider eLearning is important, and even less that is one of a number of important components of their courses.

Moreover, the present contribution is considered to be relevant in the *Rethinking Education in the Knowledge Society* doctoral school frame, concerning the following two threads:

Sustainability: because a sound reflection about learners emerges from crossing the theme of change in education, the request of fair teaching (that implies a fair idea of learners), and the need of evidence base to set broader pedagogical perspectives.

Informal learning: because researches show that "serious learning" and "tools for leisure" are considered separately by young learners (e.g.: Bullen *et al.*, 2009; Rapetti & Cantoni, 2010); furthermore, some authors suggest that learners are accomplishing with new instruments (that implies new experiences) their evergreen evolution tasks(e.g.: Boyd, 2010).

8.2.2: Lessons and hints for educational practitioners and instructional designers

During my doctoral experience, I had the honour to work together with people in charge of the *New Millennium Learners* project, at OECD. One day, I had the chance to hear the following comment, pronounced jokingly by a Ministry of Education:

> "After years of researches spent to define who NML are, you finally discovered that NML do not exists! Well, what we need now, actually is you to study NMT, namely the new millennium teachers... and how to train them".

I like to use this anecdote as starting point for this second step of reflection, because I find it at the same time very useful, wise, and correctly demystifying.

If we come back to the origin of the idea of a *generation of digital learners*, we substantially have to deal with the bigger educators' problem: how to engage learners in *boring* teaching, considered they have an *exciting* life. At a first look, the greatest difference between a teacher and a student is the familiarity with new media; consequently, the first upcoming solution can not help to be "let's put some ICTs in education; let's go in internet! They are everywhere, except in school…". Unfortunately (or luckily), technology in itself is not the solution to didactical trouble.

But the point is that learners do prefer face-to-face way to learn, and this is the tasty added value of the present dissertation in such discussion.

In order to sustain the above statement I need to compare results coming from two different researches – LV@USI-SUPSI and GenY@work – to the question "which is your favourite strategy to learn?".

Tab. 72: comparison of answers to question "which is your favourite strategy to learn?" % of respondents answering "Very much" in GenY@work (236 participants) and LV@USI-SUPSI (562 participants). Multiple answers allowed.

Workers	Students
• search engines (53,6%) • classroom teaching (52,8%) • individual study (42,9%) • individual f2f training (36,5%) • subject specific websites/blogs (22,7%) • eLearning online platforms (19,3%) • multimedia supports (18,0%) • printed dictionaries/encyclopaedias (17,2%) • social networks (7,3%)	• search engines (57,2%) • classroom teaching (52,3%) • individual study (50,8%) • wikipedia (35,4%) • eLearning online platforms (35,0%) • subject specific websites/blogs (33,2%) • individual f2f training (30,7%) • printed dictionaries/encyclopaedias (16,8%) • multimedia supports (13,9%) • social networks (8,6%)

Data evidence is that the first three items do coincide in both rankings, and only one ICT is listed (search engines). Wikipedia ranks n. 4 for students, who do appreciate eLearning online platforms almost twice as much as their colleagues at work.

Both groups do not perceive at all social networks as a learning tool, and do make a very limited use of printed dictionaries and encyclopaedias, which seem to have been replaced by online search (Cantoni, 2011).

The above case put in evidence a description of LoDE which allows to deduce some useful points which might be disseminated within the circle of educational practitioners and instructional designers.

i. Dealing with the dichotomy education and ICTs, we must not confuse: educational needs, didactical constraints, vogues of innovation, educational-anthropological implications.
ii. ICTs have to be integrated in education because needed; and not because students ask for them, teachers hope to solve methodological troubles, or policy officers are following some technological trends.
ii. Pedagogy, communicational processes, and technological development proceed on different paths, at different rhythms.
v. One thing is the technical competence, other thing is the media competence which

implies the ability of managing knowledge.

v. Anthropological "horizons of meaning" (Degani & Mozzanica, 2009) are not simply reachable through methodological turns.

vi. The challenge is to educate to the critical thinking who is able to find more information than the teacher (who is *magis-ter*, in Latin: "three times more"). The learner can be media competent, the educator is pedagogically competent.

8.2.3: A contribution to the pedagogy for the 21st century

The journey developed throughout this dissertation opens to three open questions which need to be faced, within the broader discourse about the pedagogy for the 21st century: the problem of "digital illiteracy"; the learning transfer from informal to formal experiences; the skill transfer from individual massive ICTs' usages to educational contexts.

The problem of "digital illiteracy"(Gavin, 2011) represents – probably – the biggest question about education in the 21st century: nowadays learners are, willy-nilly, eLearners; universal schooling – pushed by a society structured around the industrial revolution of 19th century – was conceived to universalise literacy and basic numeracy, which are either contents and methods considered to be fundamental; so, given that times are changed, the question is whether the notion of literacy has to be enlarged to digital. As per today, it is *unconceivable* people can not use a computer connected to the internet; in facts, it is very useful, it is powerful, it can be cheaper than in the past, everybody do it, and you need this ability to access job places. So? We can not help! On the other side, objectors of the digital turn underline that this is a deterministic way to consider educational development; besides, they might remark, the school invented in 19th century pushed by industrial revolution had pros and cons, are we sure we want to invent a new idea of the school (and university) pushed by digital revolution, implementing brand new pros and cons? Everybody use cars, and we need them to go to job; in spite of this, we do not teach "Car-literacy" in secondary schools. So? digital development is driving too much our pedagogical horizons!

The answer, in my humble opinion, is in the middle; it is complex; it is not universal, rather contextualized. Digital technologies have to become part of didactical experiences; but the educational-psychological-anthropological stages of development come first. Enlarging school *curricula* to digital practices and contents might be the answer to the tomorrow needs, or might become the implementation of new cultural divides between the better digital-educated and the others. All in all, the decision about such question comes after a reflection about "Who is the person we are educating? What are we thinking for this person, at the end of the educational process?". Do we want a citizen, a researcher, a worker, a free-thinker, a soldier, an artisan, a futurist, "another brick in the wall", a survivor, an "ant", a "grasshopper", a... mature person? Answering to this question is crucial, and it depends on beliefs, idea of society, philosophy and anthropology. Moreover, it is influenced by historical time in which one live, country's needs and hopes. I heard about secondary teachers who are experimenting lessons of history via Twitter, because of its great engaging power (Burchia, 2012); this is only one of the possible answers to the question we put in light.

Connected to the above issue, there is the reflection about how to make possible the learning transfer from everything individuals can learn in informal experiences with media. The theme is much less theoretical, and it concerns the need to capitalise a big amount of information; hopefully transforming it in knowledge. But the difficulty regards the selection process. The power of media is intrinsic to their characteristics: for instance, Facebook (or any other social network) is great to make people share their vacation's pictures because it is especially aimed to that scope, and – not at all irrelevant – people do like to share their vacations' pictures; when teachers try to use social networking for learning purposes struggle with the fact that such online facilities are not conceived to make students share their mathematic homework, and – clearly – this latter is very much less attractive. According to Schulmeister, the turning point is dealing with motivation and behaviours:

> In deconstructing media use, one of the most important arguments is that doing something similar does not mean that the actors share the same intention. Therefore it is necessary [...]

> a step to deconstruct the motives for computer and Internet use by uncovering observable behaviour or asking subjects for their intention (Schulmeister, 2010, p.43).

It is possible to support an idea of learning which moves from the informal experience and practice; but it is not at all easy to narrow it. Facilities concerning geography – such as Google Maps – can enlarge learners competences in such field, but are unequivocally too related to individual practice. Assessing knowledge in geography becomes harder.

Furthermore, during the research project Gen Y @ work we came to the following conclusions: a massive usage of new technologies provides to learners a huge number of information, but such amount of data rarely transforms in an enduring body of knowledge (Rapetti & Cantoni, 2009). Discussing with participants the following graphs emerged. It represents graphically their distinction between *informazione* (information), *conoscenza* (knowledge), and *apprendimento* (learning). In particular they put a symmetric opposition between the need to get an immediate info, and the building of a durable object of learning; for the first case, a search engine fits best, while the classical usage of books and written notes continues to be preferred for the second case.

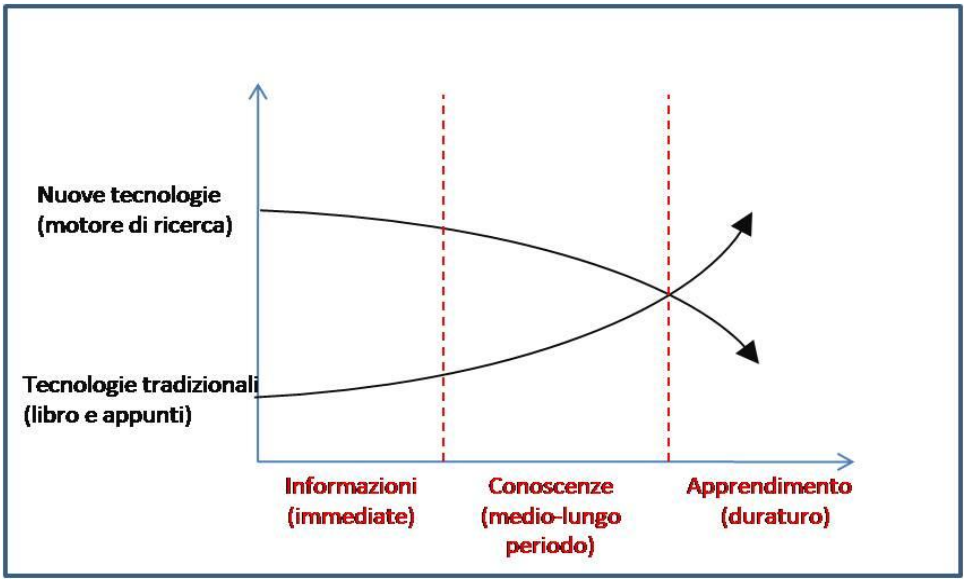


Fig. 75: relationship between methodologies and the permanence of knowledge in Gen Y @work

The third open question is, somehow, the other facet of the just discussed theme: the skill transfer from individual massive ICTs' usages to educational contexts. The issue behind

such idea is how to capitalise the eLearners experience for what concern their repeated actions with digital learning, and consider how to transfer this skill into formal context. For instance, the speediness in retrieving information and the mental protocol people put in place to get the searched data. All in all, the skill transfer is harder to be evaluated.

Data collected in the two Universities of Ticino within LV@USI-SUPSI brought evidence that the informal everyday usage of digital devices has not been naturally and completely transferred to formal learning activities yet. It appears more related to communication and collaboration. Even if ICTs are pivotal in everyday life, and they are expected to play a bridging role between informal and formal practices of learning, in our understanding ICTs seems to have an alongside role (Rapetti, Vannini & Picco, 2011).

Additionally, it has been remarked that:

> A transfer of competences acquired by using media to learning does not seem to take place or at least not in the expected amount and direction. The use of computers and other media for learning is unemotionally taken as a means to an end. [...and we must take into account]many of the down sides of these technologies – the undemocratic tendencies of many online 'communities', the limited nature of much so-called digital learning and the grinding tedium of much technologically-driven work. It also tends to romanticize young people, offering a wholly positive view of their critical intelligence and social responsibilityc(Schulmeister, 2010, p.55).

An additional consideration relevant for the pedagogists' circle of reflection concerns the idea of a generation of digital learners, and the scientific approach behind it.

The pedagogy, conceived as the science of education, has the duty to remove obstacles to the achievement of psycho-educational goals. Not by chance, Rosmini – Italian philosopher of education in the 19th century –, distinguishing between ontological sciences and ethical sciences, placed the pedagogy within the "ought-to" sciences;

meaning within those in charge of studying the processes of transformation and improvement of society (Cambi, 1995; Rosmini, 1964). According to his view, a vision of eLearners based on generational oppositions or overgeneralizations seem inappropriate. The theory of education leading the 21st century has to be founded on pedagogical alliances between skilled and less skilled people; and must influence the idea of eLearning and the consequent ICTs adoptions and development. Not *vice versa*.

It is remarkable that in 2011 we had anniversaries of two expressions which led the discussion about education and new media: in 1991 "generation Y" was invented (Strauss & Howe, 1991), and in 2001 "digital natives" entered the debate (Prensky, 2001a; Prensky, 2001b).After more than twenty years of discussions, it is now time to overcome an understanding of the issue which replicates the gap... (Rapetti & Cantoni, 2012 forthcoming)

This thesis is intended to show why, both in theory and in practice, there are many good reasons to adopt a fresh perspective. After 20 years of "mind the gap!", now we have to work out how to close this gap, if existing.

8.3: Limits and future explorations

Scientific and intellectual honesty demands to briefly re-illustrate the limits of the research "Learners' Voices at USI-SUPSI", already detailed in paragraph 6.5.3.

Theoretical limit

One can argue against the above framework two arguments: it looks like a melting pot of ideas; there is not enough evidence to support the choice of those references, instead of a number of many possible others.

To counter-argument the metaphor of map is valuable. Objective of this chapter is to identify tools to navigate the thousands of ideas that explain the dyad learners and ICT. Therefore, it seemed essential to define the space of reflection and identify landmarks: the map of the four disciplines serves to explain on what ground we are doing research; the chosen references work as landmarks. This map is not meant to describe everything because the goal is a synthesis, and not a deep analysis, of the main issues related to digital experiences of learning. In fact, the point is to recognize we are in a specific

context (be the jungle, be the knowledge society), and then we must consider a number of things; and it seems that some of them should definitely be used as compasses, in order to not get lost.

What expressed in this chapter constitutes the theoretical framework behind the perspective adopted in this dissertation and inspiring all the consequent empirical researches. It is well-recognized that a neutral perspective or an unquestionable approach to topic in human and social sciences do not exist. The researcher's intellectual honesty represents the undisputed landmark for the author of what you read, together with the fortunate condition of the complete freedom of expression and analysis. Therefore, taken for grant that this work can not help to be partial, the chosen structure was inspired by the aim to reduce as much as possible the partiality, or – at least – to make explicit which are the references.

Concerning the empirical level, The two biases that are more relevant – and which could eventually dim these conclusions – are the sampling bias and the cultural bias.

The first refer to the limits in the sampling choice, which did not permit to achieve a statistically significance of the internal variance of the sample; so we were not allowed to cluster our population and to identify clear and sharpened learning profiles. Despite the sampling procedure was put in place without error, we obtained a dataset in which people are probably too close each other.

The importance of clusters and profiles comes from the overcoming of simplistic views which just split the worldin two parts: digital natives versus immigrants; digital adapted versus renegades; digital citizens versus visitors; or technophiles versus technophobes.

It must be underlined that "Not all the studies arrived at identical classifications of users", because different studies sprout out from different cognitive approaches and different interests; and thus pose different questions and choose different methods of collecting data (Schulmeister, 2008). In particular we aimed to compare with two research projects, because of the complexity and richness of their clusters and profiles: "New Millennium Learners"(OECD-CERI, 2010) and the studies about the media competence model by Treumann, and colleagues (2007). In the first case the most

relevant criterion of analysis was the comparison between educational and leisure in digital media diet; they found six profiles: analogue, digi-casual, digi-wired, digi-sporadic, digi-educational, and digi-zapper. The German researchers, instead, worked on combining age with different media activities (also "classical" media); they identified:cthe All-Rounder, the Educationally Orientated, the Consumer Orientated, the Communication Orientated, the Deprived, the Designer, the Positionless.

Surely, in future explorations, clusters, profiles and learning cultures will be explored more and deeper. Besides, the profiles and scenarios combination could be the next step, after Learners' Voices, to carry forward the research about LoDE.

The second relevant limit concerns Ticino. And we named it "cultural bias".

This is a clear limit and – indeed – it impacts much less the consistency of conclusions. Being "Learners' voices at USI-SUPSI" run at university institutions of a regional area of Switzerland, outcomes of our research call for further and deeper analyses meant to compare different variables; especially the ones related to differences between countries/cultures, and levels of schools.

Given the two mentioned limits, and the detailed list in paragraph 6.5.3, the usefulness of Learners' Voices does not decreases.

8.4: Final remarks: the challenge is adopting paradigms while avoiding stereotypes at the same time

From the theoretical point of view, it is possible to comprehend the whole dissertation according to the following statement: the challenge is adopting paradigms while avoiding stereotypes at the same time.

Changing paradigm to interpret learning does not mean to change mindset concerning learners

As said before, the point is not to deny the obvious; neither to claim school and universities have to come back at the Stone Age. Nevertheless, there are some advices that need to be clearly stated.

First, re-focus on learners, as free individuals.

Second, the taxonomy showed the fake-effects of rhetoric in pedagogy. This must be taken as caveat, antidote against exaggerated simplifications, unrequested generalizations, and deterministic approaches.

On the contrary, it is highly recommended to know before, and then project customized pedagogies. Useful tools to follow this advice are: learners' profiles (e.g.: Kennedy,*et al.*, 2006; Kennedy,*et al.*, 2010), observed within learning institutions' scenarios; and media diet studies (e.g.: Cola, Prario & Richeri, 2010; JISC consortium, 2009; Rapetti, e*t al.*, 2010).

Third, admit that we still miss a broader, sound, comprehensive, shared, and effective eDidactic, but put it on top of our research agendas.

Finally, the point is to fight against inequalities, rather than to strengthen them implicitly, using a-critically improper labels to define learners.

As the very last point, it is said that one academic work is worthy if containing at least one little brick of evidence-based knowledge in a given area of research. It would be a great gladness if the humble contribution of these pages could be a linguistic choice of readers, that is avoiding the catchy but inaccurate expression *young people learn differently* (and all the subsequent ones), adopting a more cautious perspective.

We would say that it is better to leave expressions such as "digital learners" (even more "digital natives" or "digital kids"), since they are not really useful.

If a label is needed, we can suggest to accept LoDE...

The final candy is the counter-melody to the figure nr.2 put in the introduction (see p.32) about the *nueva generaciòn tecnificada* (technologized brand new generation)experienced by the little Mafalda.

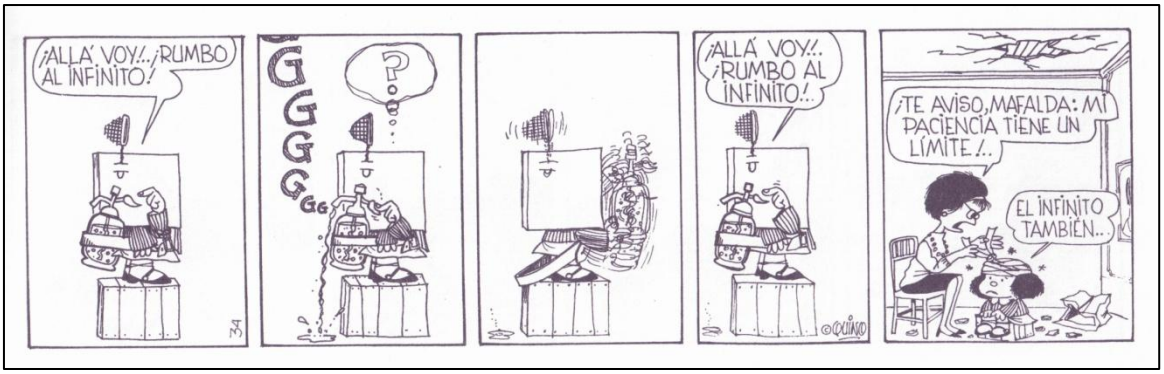


Fig. 76: "Rumbo al infinito"
(Source: Quino, 2004)

Without the pedagogical competence of educators, the technological innovation is very likely to be not enough for the youngest.

ANNEXES

9.1: Qualitative dataset

9.1.1: Daily media diet diaries

9.1.1.1: Miss R.A. daily media diet diary

Tab. 73: miss R.A. daily media diet diary

Ora	Tecnologia	Funzione	Uso
7.30	Cellulare	Funzione sveglia	Il cellulare fa un suono che funziona come sveglia
8.00	Teiera elettronica	Alimentazione	Scaldo l'acqua per farmi una tazza di te
8.15	Spazzolino elettrico	Igiene	Lavare i denti con lo spazzolino che si muove da solo
8.19	iPod	Funzione musica	Uso l'iPod per ascoltare musica mentre cammino versol'università
8.20	Orologio	Indicazione del tempo	Controllo il tempo sul mio orologio da polso
8.21	Ascensore	Trasporto	Il bottone dell'ascensore è acceso; vuol dire che è occupato. Una volta spento, chiamo l'ascensore schiacciando sul bottone
8.22	Ascensore	Trasporto	Scendo 6 piani con l'ascensore che mi indica su che piano mi trovo in qualsiasi momento
8.25	Semaforo	Comunicazione	Schiaccio il bottone del semaforo , il quale quindi diventa"verde"
8.30	Computer portatile	Applicazione di creazione di testi	Uso Word per prendere appunti durante la lezione
8.35	Beamer	Supporto lezione	Guardo le slides che il beamer proietta sulla lavagna

9.15	Cellulare	Applicazione di messaggi	Controllo se qualcuno mi ha mandato un messaggio
9.20	iPhone	Applicazione di giochi	Con la mia compagna di banco faccio un gioco sul suo iPhone
12.16	Porta scorrevole	Entrata	Entro nell'altro palazzo dell'università attraverso le porte scorrevoli
12.18	Bancomat	Ritirare soldi	Vado al bancomat dell'università per ritirare soldi del mio account; comunico attraverso l'interfaccia per indicare la somma che desidero e per inserire il mio codice segreto
12.30	Cassa	Pagare il pranzo	In mensa faccio la fila per poter pagare il mio pranzo alla cassa che mi indica sul display il prezzo e ,una volta pagato, fa uscire un scontrino
13.00	Cellulare	Applicazione chiamate	Uso il cellulare per chiamare un'amica per mettermi d'accordo su un appuntamento per la sera
13.30	Computer portatile	Applicazione di creazione dei testi	Ricomincio ad usare il portatile per prendere appunti su Word
13.32	Computer portatile	Browser Internet	Vado un attimo su Internet per controllare le mie emails
14.15	Distributore di bibite	Alimentazione	Vado al distributore di bibite, schiaccio il bottone della bibita desiderata e la macchina mi indica il prezzo. Inserisco i soldi ed esce la bottiglia
15.10	Cellulare	Applicazione messaggi	Mi arriva un messaggio a cui rispondo subito
15.20	Badge	Chiave	Uso il badge dell'università come chiave per

			aprire l'ufficio del mio capo
15.23	Computer Desktop	Browser Internet-motore di ricerca	Vado su Google e faccio una ricerca
15.35	Computer Desktop	Applicazione per la creazione di presentazioni	Uso PowerPoint per fare le Slides
15.50	Telefono	Comunicazione	Suona il telefono in ufficio, parlo con la collaboratrice
16.00	Scanner	Scannerizzazione	Uso lo Scanner per fare delle scannerizzazioni
16.10	Computer Desktop	Applicazione per immagini	Uso PhotoShop per cambiare le immagini scannerizzate
16.30	Porta scorrevole	Uscita	Esco attraverso le porte scorrevoli dell'USI
16.45	Scale mobili	Trasporto	Uso le scale mobili nella Migros per scendere
17.15	Scanner	Cumulus	La carta Cumulus è connessa al sistema della banca dati e mi vengono aggiunti dei punti
17.20	Carta Maestro	Pagare	Pago con la carta Maestro; l'acquisto sarà trasferito alla banca e mi saranno tolti i soldi dal mio conto corrente
17.30	Ascensore	Trasporto	Salgo 6 piani con l'ascensore che mi indica su che piano mi trovo in qualsiasi momento
17.45	Ipod e diffusore	Applicazione musica e diffusione del suono	Attacco il mio Ipod alle casse e ascolto musica
18.00	Computer Portatile	Applicazione creazione di testi	Scrivo un invito per il mio gruppo di volontari

18.30	Stampante	Stampare	Uso la stampante collegata con il mio computer per stampare l'invito
20.30	Computer Portatile	Applicazione Social Media	Uso Facebook per mandare un messaggio a un amico
20.30	Computer Portatile	Applicazione per chiamate	Uso Skype per parlare con un'amica
21.00	Forno	Riscaldare cibo	Uso il forno per cucinare; quando è caldo me lo indica con una piccola luce rossa che si spegne

9.1.1.2: Mister E.P. daily media diet diary

Tab. 74: mister E.P. daily media diet diary

Ora	**Tecnologia**	**Funzione**	**Uso**
8:00	Sveglia	Sveglia	Sveglia della radio con puntatore laser dell'orario sul soffitto.
8:05	Macchina da caffè	Alimentazione	Attesa che il led colorato lampeggi per segnalarmi che l'acqua ha raggiunto la temperatura richiesta per un caffè espresso.
8:10	Rasoio elettrico	Igiene	Il rasoio indica con un led di colore rosso che è acceso e pronto radere.
8:15	Computer	E-mail	Dopo aver visto la lampadina luminosa che indica che il mio MacBook è ancora in standby, apro Safari (browser internet) e controllo le mie caselle e-mail cui evito di rispondere per problemi di tempo.
8:15	IPhone	Aggiornamento	Stacco il cellulare dalla carica e controllo eventuali messaggi o chiamate.
8:25	IPhone	Musica	Pronto per uscire entro nell'Ipod del mio IPhone e seleziono una canzone.

8:26	Ascensore	Trasporto	Schiaccio il bottone per la chiamata dell'ascensore, il quale si illumina di giallo.
8:26	Ascensore	Trasporto	Entro nell'ascensore e schiaccio il pulsante del piano desiderato (piano terra).Si può vedere l'indicazione di ogni piano che man mano si scende si illumina di rosso.
8:27	Luci	Illuminazione	Una fotocellula rileva il mio passaggio dall'uscita posteriore della casa che causa l'accensione delle luci al pian terreno e al cortile esterno.
8:27	Contachilometri	Contare i chilometri	Controllo la velocità della mia bicicletta (evento sporadico).
8:27	Indicazione luminosa	Informativa pubblicistica	Leggo involontariamente l'indicazione luminosa sotto al cartello di una farmacia (temperatura/data/ora).
8:28	Semaforo	Regolamentare il traffic	Schiaccio il bottone per velocizzare i tempi di attesa del segnale verde per attraversare la strada.
8:29	Porta scorrevole	Entrata	Una fotocellula rileva il mio passaggio e apre la porta principale del palazzo bianco dell'università.
8:29	Porta scorrevole	Uscita	Una fotocellula rileva il mio passaggio e apre la porta secondaria del palazzo bianco dell'università.
8:30	Cellulare	Togliere le suonerie	Dopo aver spento la musica, mi assicuro che il mio iPhone sia impostato su silenzioso.
8:30	Proiettore video	Supporto lezione	Vedo le slides delle lezioni proiettate sul muro.

08:35 – 10:15	Puntatore laser	Segnalare evidenziare	Visione del puntino rosso. Uso con discreta frequenza da parte del professore di un puntatore laser per evidenziare i contenuti principali della lezione sulle slides proiettate.
10:18	Macchina da caffè a monetine	Conteggio credito e alimentazione	Durante la pausa decido di prendere una cioccolata. Dopo aver introdotto il credito necessario per l'erogazione della consumazione desiderata, schiaccio il bottone e compare sulla stringa luminosa verde della macchinetta "in erogazione". Sento il "bip" con cui capisco che la bevanda è pronta.
10:33	IPhone	Registratore vocale	Decido di registrare la lezione in quanto considero i contenuti rilevanti.
12:05	IPhone	Telefono	Chiamo un amico per organizzare un pranzo veloce.
12:09	Porta scorrevole	Entrata	Una fotocellula rileva il mio passaggio e apre la porta secondaria del palazzo bianco dell'università.
12:10	Distributore sigarette	Conteggio credito e prelevare sigarette	Inserisco il credito necessario nel conta monete del distributore automatico e prelevo la marca di sigarette desiderata.
12:12	Porta scorrevole	Uscita	Una fotocellula rileva il mio passaggio e apre la porta secondaria del palazzo bianco dell'università.
12:20	Semaforo	Regolamentare il traffico	Schiaccio il bottone per velocizzare i tempi di attesa del segnale verde per attraversare la strada.

12:55	Cassa	Lettura importo	Leggo il conto del ristorante su uno schermo.
13:10	Carta di credito	Pagamenti	Inserisco e digito il codice della mia carta nell'apposito apparecchio per pagare il pranzo.
13:12	IPhone	Chiamata con Skype	Apro l'applicazione Skype e faccio una chiamata.
13:14	IPhone	Chiamata con Skype	Faccio un'altra chiamata con Skype per informare un amico di un compleanno.
13:20	IPhone	E-mail aggiornamento	Controllo le mails senza rispondere a nessuna.
13:24	Porta scorrevole	Entrata	Una fotocellula rileva il mio passaggio e apre la porta principale del palazzo bianco dell'università.
13:24	IPhone	SMS	Apro l'IPhone per leggere un sms.
13:33	IPhone	SMS	Rispondo all'SMS che mi è arrivato pochi istanti fa.
14:04	Lavagna luminosa	Supporto lezione	Leggo la proiezione della lavagna luminosa che serve di supporto per la lezione del professore.
14:40	IPhone	SMS	Invio un sms durante la lezione.
14:40	Ascensore	Trasporto	Schiaccio il bottone per la chiamata dell'ascensore, il quale si illumina.
14:40	Ascensore	Trasporto	Entro nell'ascensore e schiaccio il pulsante del piano desiderato (piano terra).Si può vedere l'indicazione di ogni piano che man mano si scende si illumina.

14:41	Ascensore	Fermata	Mi stavo specchiando nell'ascensore quando mi accorgo che si stanno chiudendo le porte dell'ascensore al piano che ho scelto e sono costretto a passare velocemente la mano sulla fotocellula per arrestarle.
14:41	Porta scorrevole	Uscita	Una fotocellula rileva il mio passaggio dall'uscita posteriore della casa che causa l'accensione delle luci al pian terreno e al cortile esterno.
14:43	IPhone	Chiamata	Faccio un'altra chiamata a mia madre.
14:48	IPhone	Musica	Pronto per uscire entro nell'Ipod del mio IPhone e seleziono una canzone.
15:05	Computer	Controllo disponibilità di un libro	Entro in biblioteca e uso il computer dell'ingresso per controllare la disponibilità di un libro.
15:15	Scheda universitaria	Registrazione prestito	Il bibliotecario passa la mia scheda sotto un lettore magnetico per registrare il prestito del mio libro.
15:15	Citofono	Comunicazione del mio arrivo	Mi faccio aprire il portone principale della casa mia zia.
16:00	IPhone	Musica	Spengo la funzione ipod del mio iPhone.
16:15	Apriporta	Aprire portone	Schiaccio il bottone per uscire dal condominio di mia zia.
17:04	Computer	Svariato	Mails, stampare documenti, chat, Skype.
17:50	Telefono	Chiamata	Faccio una chiamata dal fisso di casa mia.
17:50	Computer	Musica	Ascolto del sano rock.
17:50	Ascensore	Trasporto	Schiaccio il bottone per la chiamata dell'ascensore, il quale si illumina di giallo.

17:55	Ascensore	Trasporto	Entro nell'ascensore e schiaccio il pulsante del piano desiderato (quarto piano).Si può vedere l'indicazione di ogni piano che man mano si scende si illumina di rosso.
17:55	Luci	Illuminazione	Una fotocellula rileva il mio passaggio dall'uscita posteriore della casa che causa l'accensione delle luci al pian terreno e al cortile esterno.
17:55	Chiavi della macchina	Apro la mia macchina	Uso il telecomando sulle chiavi della macchina per aprire le porte.
17:55	Macchina	Accensione	Aspetto lo spegnimento delle spie luminose sul cruscotto e schiaccio il bottone per l'accensione
17:56	Macchina – radio	Radio	Accendo la radio e ascolto una stazione di notizie.
17:57 - 18:10	Macchina – contachilometri	Controllo velocità	Guardo il cruscotto per controllare la mia velocità.
17:59	Telecomando garage	Aprire portone	Schiaccio il bottone del telecomando per aprire la porta del garage.
18:11	Macchina	Frecce segnaletiche	Uso svariato delle frecce segnaletiche per segnalare la mia direzione alle altre macchine.
18:11	Macchina	Clacson	Utilizzo il clacson per "suonare" ad una macchina che non mi stava dando la precedenza poiché sono italiano.
18:28 - 20:30	Macchina	Spegnimento	Schiaccio il bottone per lo spegnimento della mia macchina.
20:40	Chiavi della macchina	Chiudo la mia macchina	Uso il telecomando sulle chiavi della macchina per chiudere le porte.

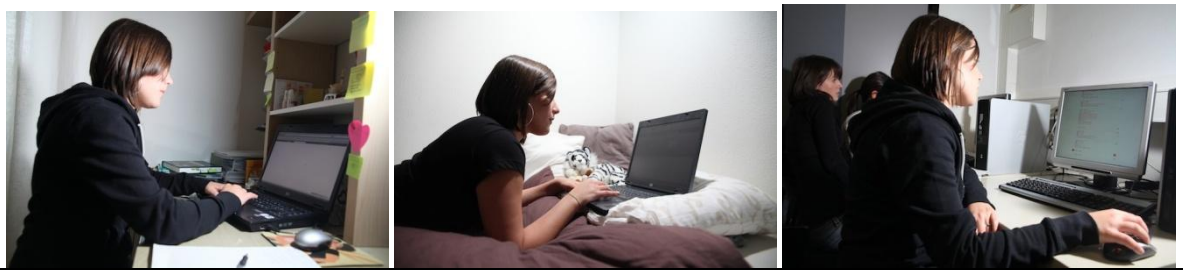
20:41	Sensori elettronici	Conteggio punti scherma	Nel gioco della scherma, ogni volta che qualcuno tira un punto valido, una spia luminosa e un rumore (bip)segnano il punto.
21:41	Chiavi della macchina	Apro la mia macchina	Uso il telecomando sulle chiavi della macchina per aprire le porte.
21:42	Macchina	Accensione	Aspetto lo spegnimento delle spie luminose sul cruscotto e schiaccio il bottone per l'accensione
21:42	Macchina - radio	Radio	Accendo la radio e ascolto una stazione di notizie.
21:42	Macchina - contachilometri	Controllo velocità	Guardo il cruscotto per controllare la mia velocità.
21:46	Semaforo	Linea rossa	Dei sensori hanno rilevato la mia velocità (58 km/h) il semaforo è così diventato rosso.
21:47	Macchina	Frecce segnaletiche	Uso delle frecce segnaletiche per segnalare la mia direzione alle altre macchine.
21:47	Telecomando garage	Aprire portone	Schiaccio il bottone del telecomando per aprire la porta del garage.
22:00	Macchina	Spegnimento	Schiaccio il bottone per lo spegnimento della mia macchina.
22:02	Chiavi della macchina	Chiudo la mia macchina	Uso il telecomando sulle chiavi della macchina per chiudere le porte.
22:05	Microonde	Countdown dei minuti	Controllo i secondi che rimangono per la cottura.
22:35	Fornelli	Illuminazione	Posso rendermi conto dell'attività di un fornello guardando il suo colore (arancione).
22:35	Computer	Svariato	Navigo in Internet, ascolto la musica, chatto in MSN e Skype.

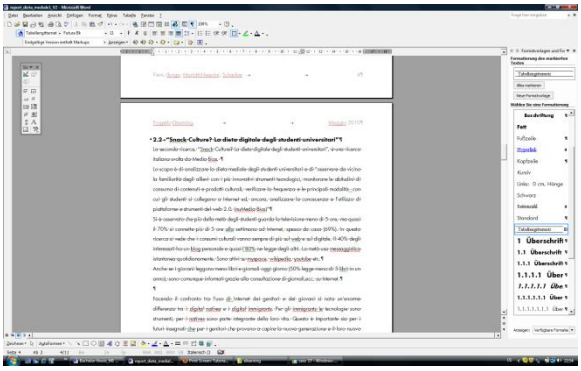
23:15	Telecomando TV	Accendo la television	Utilizzo il telecomando per accendere la televisione e scelgo un canale
23:30	Telecomando TV	Carrellata	Passo numerosi canali dal telecomando
23:30	Lavastoviglie	Accendo la lavastoviglie	Accendo la lavastoviglie, si illumina una spia rossa.
23:38	Ascensore	Trasporto	Schiaccio il bottone per la chiamata dell'ascensore, il quale si illumina di giallo.
23:40	Ascensore	Trasporto	Entro nell'ascensore e schiaccio il pulsante del piano desiderato (piano terra). Si può vedere l'indicazione di ogni piano che, man mano che si scende, si illumina di rosso.
23:40	Bancomat	Prelievo	Dopo aver inserito la tessera e digitato il mio codice prelevo dei soldi.

9.1.2:Weekly media diet diary

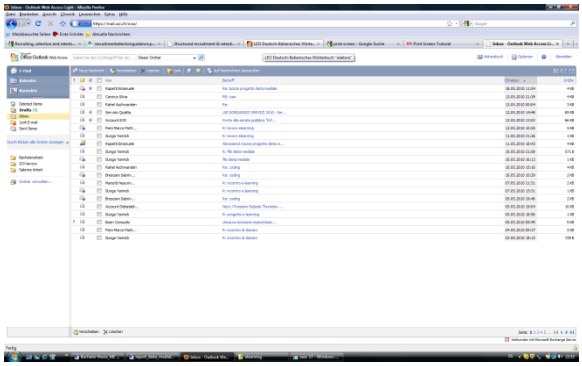
<u>Computer connected to the internet</u>

Here below the details of Computer usages.





Using Word, Excel, Powerpoint



Emailing

Social networking

Reading online newspapers and eBooks

Skype, Msn, Chat

Skype to:

- chat

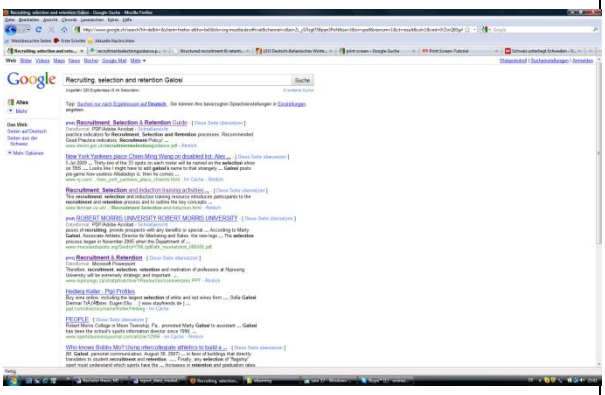
- send SMS

- phone

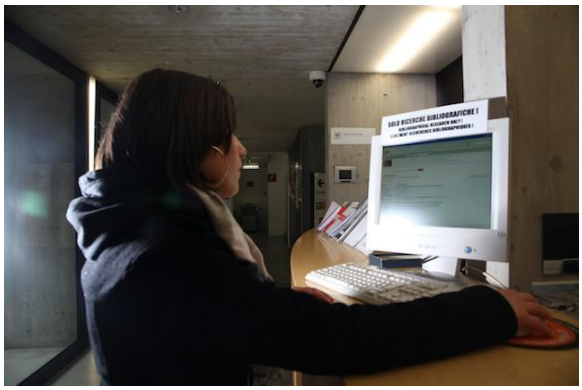
- share materials

Watching online TV and films.

Listening to the radio or music



Online researches via Google, Google scholar, Wikipedia



Bibliographic researches

Online dictionaries

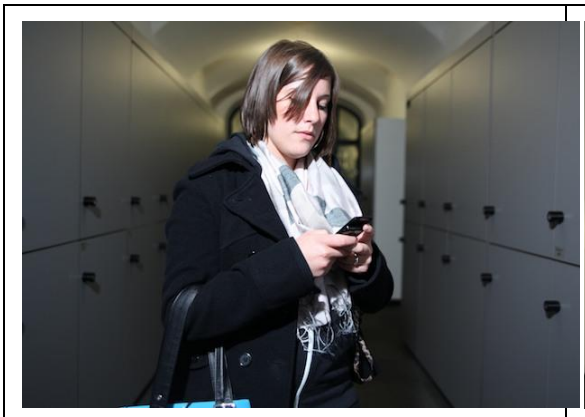
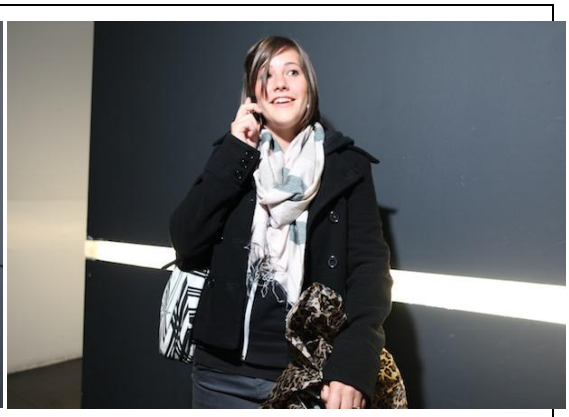
ATM (Bancomat)

Interestingly, among the relevant technologies appears the ATM, which is somehow close to computer.

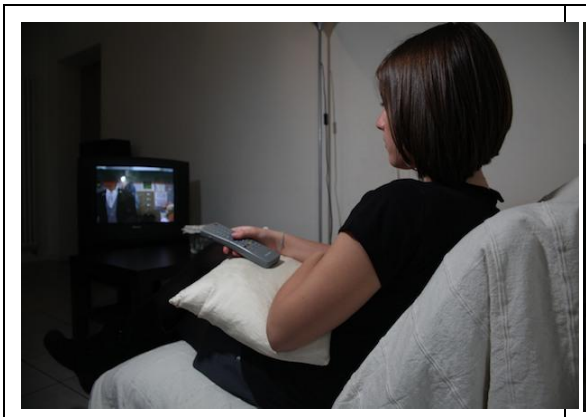
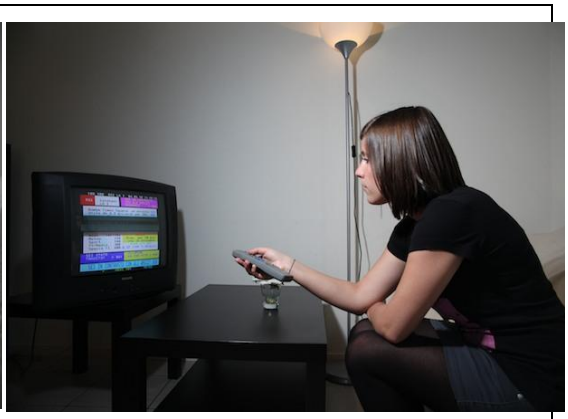
Using ATM

Cellphone

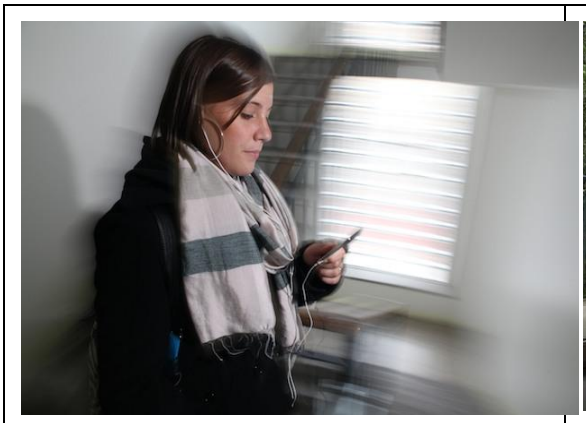
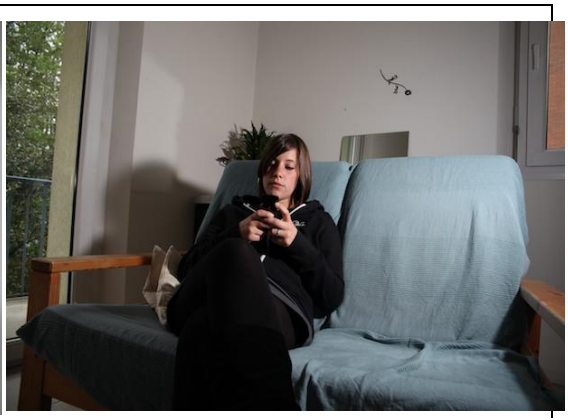
The second tool is cellphone, very massively used by the student.

	
Texting SMS	**Phoning**
	
Taking pictures	**Listening to music**

Television

	
Watching films, news, and listening to music (on specific channels)	**Using teletext**

IPod

	
Listening to music	Playing

Video beamer

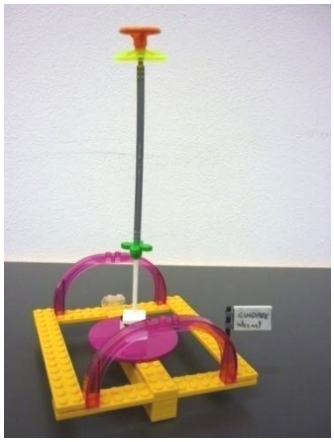
This last chosen ICT is (excluding ATM) the only one non owned by the observed person.

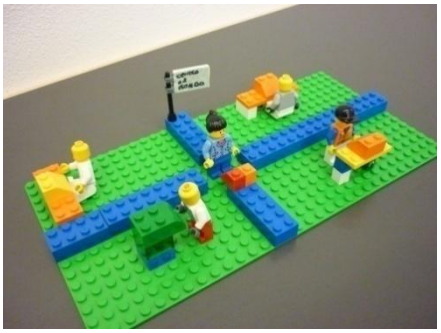
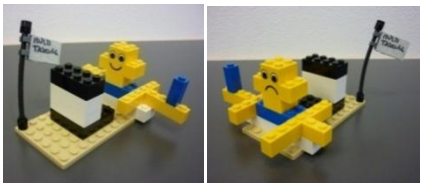
	
Learning	**Showing presentations**

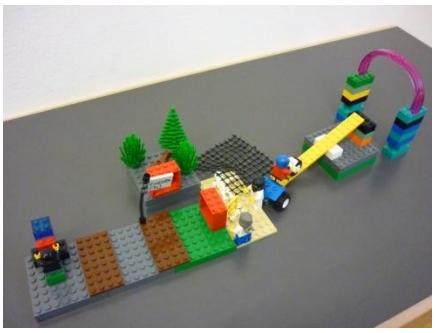
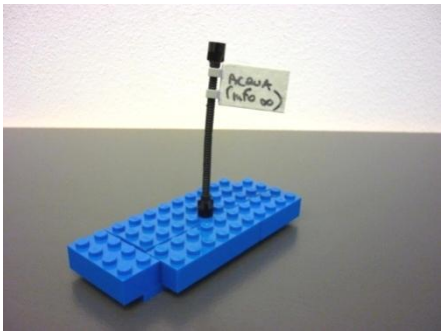
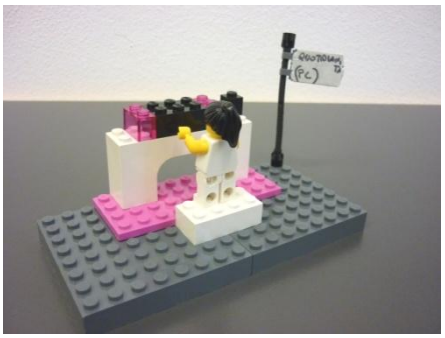
9.1.3: LEGO session @ communication sciences

Tab. 75: LEGO session @ communication sciences – 1st step

Build yourself using ICTs (language: Italian)

KEYWORD	**ARTIFACT**	**COMMENT**
Comunicazione (communication)		Due persone che sono a casa ma geograficamente si trovano in due posti diversi possono comunicare tra loro. Queste due persone diventano quasi uguali, si sentono unite perché hanno le stesse conoscenze di base.
Guidare (driving)		I modi per accedere alla conoscenza sono Internet e il metodo tradizionale. La meta è l'informazione! I limiti della nostra conoscenza sono dati dal tempo che abbiamo a disposizione o dalla possibilità di avere il materiale (magari voglio vedere fisicamente una cosa).

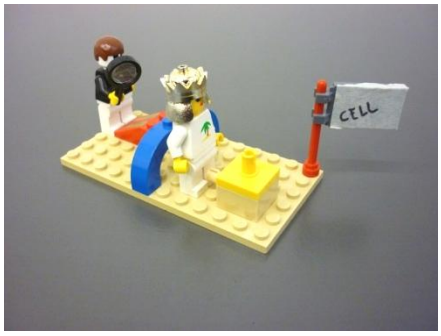
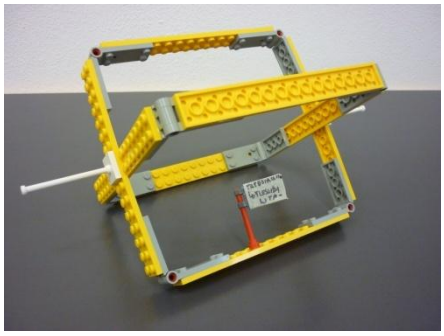
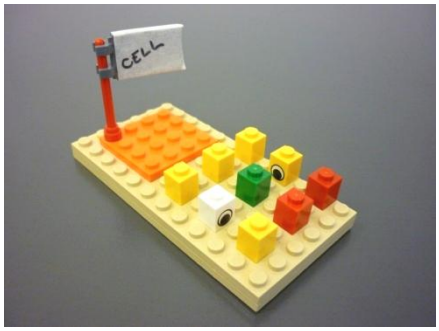
Il centro del mondo (the centre of the world)		Posso comunicare con tutte le persone del mondo trovandomi nella mia stanza. Ci sono cinque posti diversi e un'unica cosa in comune sono i computer. Io nel mio mondo sono al centro e di conseguenza anche gli altri quattro nel loro mondo sono al centro.
Multitasking (fast-switching)		Quando uso il computer ho la sensazione di fare tante cose assieme (anche se non ho la certezza che le faccio al meglio), ma in realtà faccio un fast – switching (le faccio velocemente ma comunque in modo separato). Ho la sensazione di felicità quando le faccio assieme, ma quando non riesco a finirle tutte sono infelice.

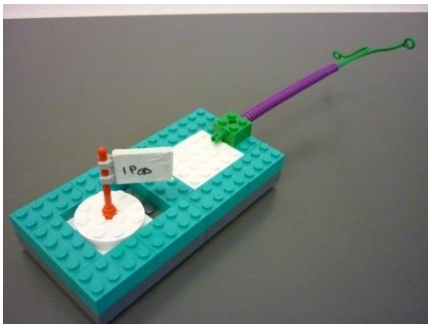
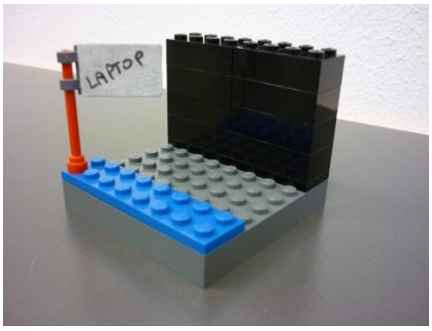
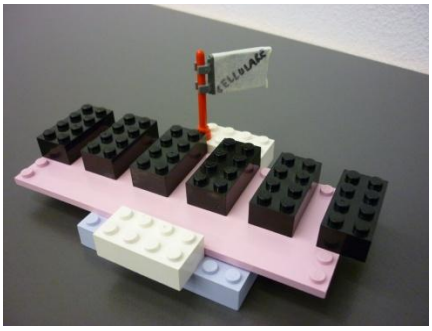
Finestra (a window)		Il computer può essere visto come una finestra sul mondo (sia reale che immaginario) → tramite Internet io posso avere le informazioni che voglio. C'è comunque uno spazio tra me e le informazioni: ad esempio non uso per forza il computer per cercare delle cose che posso trovare vicino a me.
Acqua (water)		Pensare al mare le da la sensazione dell'infinito. Computer = tantissime informazioni, ma io sono limitato per il tempo, non vado a cercare tutte le informazioni. Cosa si trova nel mare (computer)? Da tutte le informazioni, che sono strutturate poiché ho una visione più completa, rispetto alla biblioteca. (es. cercare un libro in biblioteca)
Quotidianità (daily life)		Ha rappresentato sé stessa nella stanza mentre usa il computer. C'è la possibilità di raggiungere la realtà anche se è impossibile da raggiungere fisicamente in quel momento.

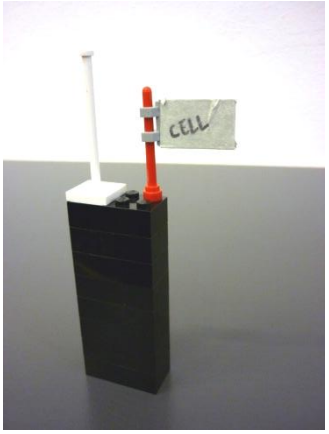
Socializzazione vs. isolamento grazie a Internet (socialization vs isolation - because of the internet)		Due vicini da casa che comunicano con il computer, socializzano attraverso il computer, ma è anche una forma di isolamento. Sono presente tutte e due le forme di comunicare, basta sceglierne una. Anche se ci sono persone in casa non comunichiamo, preferiamo comunicare attraverso il computer (spesso i giovani). Meno persone sono abituate ad avere un contatto fisico → aspetto negativo. I due vicini posso uscire di casa e comunicare.

Tab. 76: LEGO session @ communication sciences – 2nd step:

Build your favourite/most used ICTs (language: Italian)

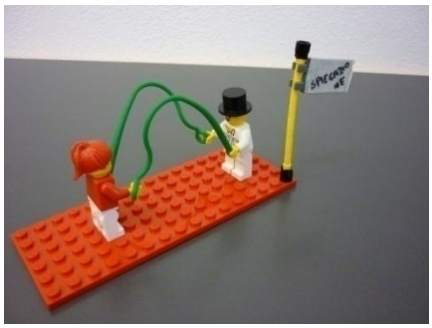
KEYWORD	ARTIFACT	COMMENT
Cellulare (cellphone)		Due persone possono comunicare tra di loro anche se fanno un'altra cosa contemporaneamente. Di fronte alle tecnologie troviamo i processi e gli oggetti stessi.
Trebbiatrice (threshing machine)		Flessibilità, adattabilità → scovare altre soluzioni che non siano quotidiane e tecnologie che si adattano alle persone.
Cellulare (cellphone)		Usa il cellulare come sveglia, per inviare sms e telefonare. Senza il cellulare avrebbe la sensazione di aver perso qualcosa e avrebbe paura che qualcuno la potesse cercare in quel momento senza poterla raggiungere. Il cellulare le serve da connection.

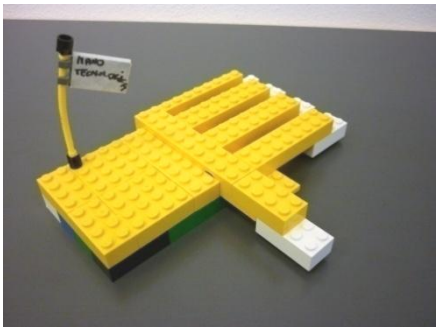
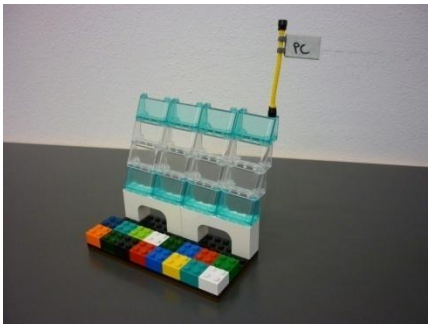
Motore diritrovo (meeting/gathering engine) [pun based on double meaning of "ritrovo"]		Molti cadaveri → si perde tempo, truffa (bisogna fare attenzione quando si naviga). Tutti quanti possono trovare i diamanti (informazioni) ed è proprio questo bello di Internet.
Ipod		Può portarlo sempre con sé ed è la tecnologia che preferisce in quanto la può controllare.
Laptop		Può fare tutto con il lap-top: musica, video, immagini, ricerche, telefonate, e-mail, compiti, ecc…
Cellulare (cellphone)		È la cosa che porta con sé maggiormente, la tecnologia che usa di più, che le piace di più ed è molto dipendente da essa. Portandolo con sé si sente sicura.

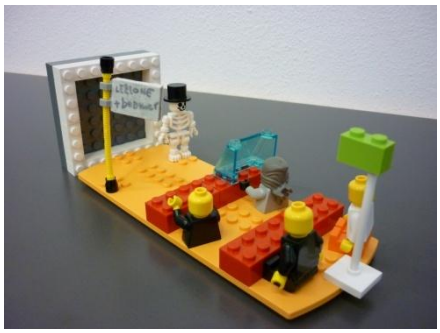
Cellulare (cellphone)		Se dimentica il cellulare si sente isolata. È la tecnologia che usa sempre di più, ma per piacere piuttosto che per bisogno.

Tab. 77: LEGO session @ communication sciences – 3rd step

Build your favourite technology to learn (language: Italian)

KEYWORD	ARTIFACT	COMMENT
Computer		Grazie ad Internet e ai suoi motori di ricerca può trovare tutte le informazioni necessarie. Il computer lo usa da sola, preferisce fare le ricerche a casa. Eventualmente se ha bisogno si sente con le amiche attraverso l'e-mail.
Libro (book)		Si può interagire con il libro, prendere appunti, raccontare la storia ad un amico, tornare a una pagina quando si vuole. Il libro è come un insegnante portatile e personale
Spiegazione (oral explanation)		C'è uno scambio di informazioni, uno ha le informazioni e l'altro le chiede

Mano tecnologica (technological hand)		Prolungamento della mano → la mano rappresenta il fare l'esperienza, mentre il prolungamento sono le esperienze in più. Fino al colore giallo è la persona mentre dal colore bianco in su sono le informazioni in più (tecnologie). La tecnologia quindi se è fatta bene permette di toccare le cose con mano, ma ci comanda rimane sempre la persona.
Computer		A livello di utilità il computer è la tecnologia più comoda visto che raggruppa canali diversi, ma può essere anche uno svantaggio ad esempio quando si deve leggere un testo lungo si preferisce sulla carta.
Lezione in aula (lecture in classroom)		Durante la lezione si può intervenire, fare domande, quindi c'è dialogo e secondo lei in questo modo si impara di più.

Lezione classica (classical lesson)		La qualità è maggiore. Ritiene che in futuro non ci saranno di più, ma è pronta a ricredersi.
Lezione classica (classical lesson)		Preferisce la lezione classica perché c'è il beamer, una persona più colta che trasmettere dei saperi. Preferisce prendere gli appunti a mano (tramite parole chiave) poiché il computer lo vede come una distrazione. Ritiene che una lezione senza la slides si possa fare.

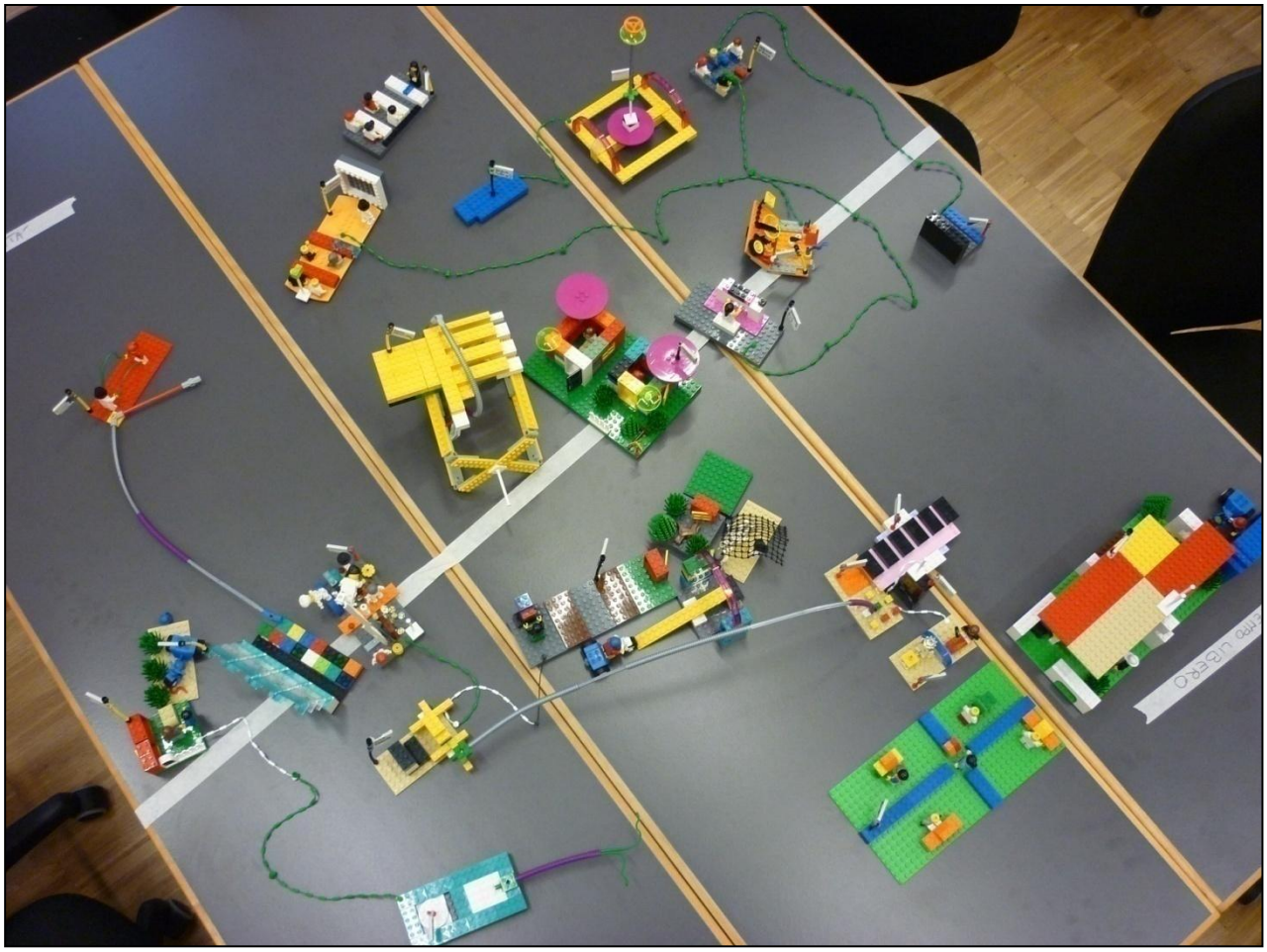


Fig. 77: LEGO session @ communication sciences – 4thand 5thsteps
share your creations on a common landscape – split between "learning" and "leisure"; then connect the two most relevant artefacts for you (language: Italian)

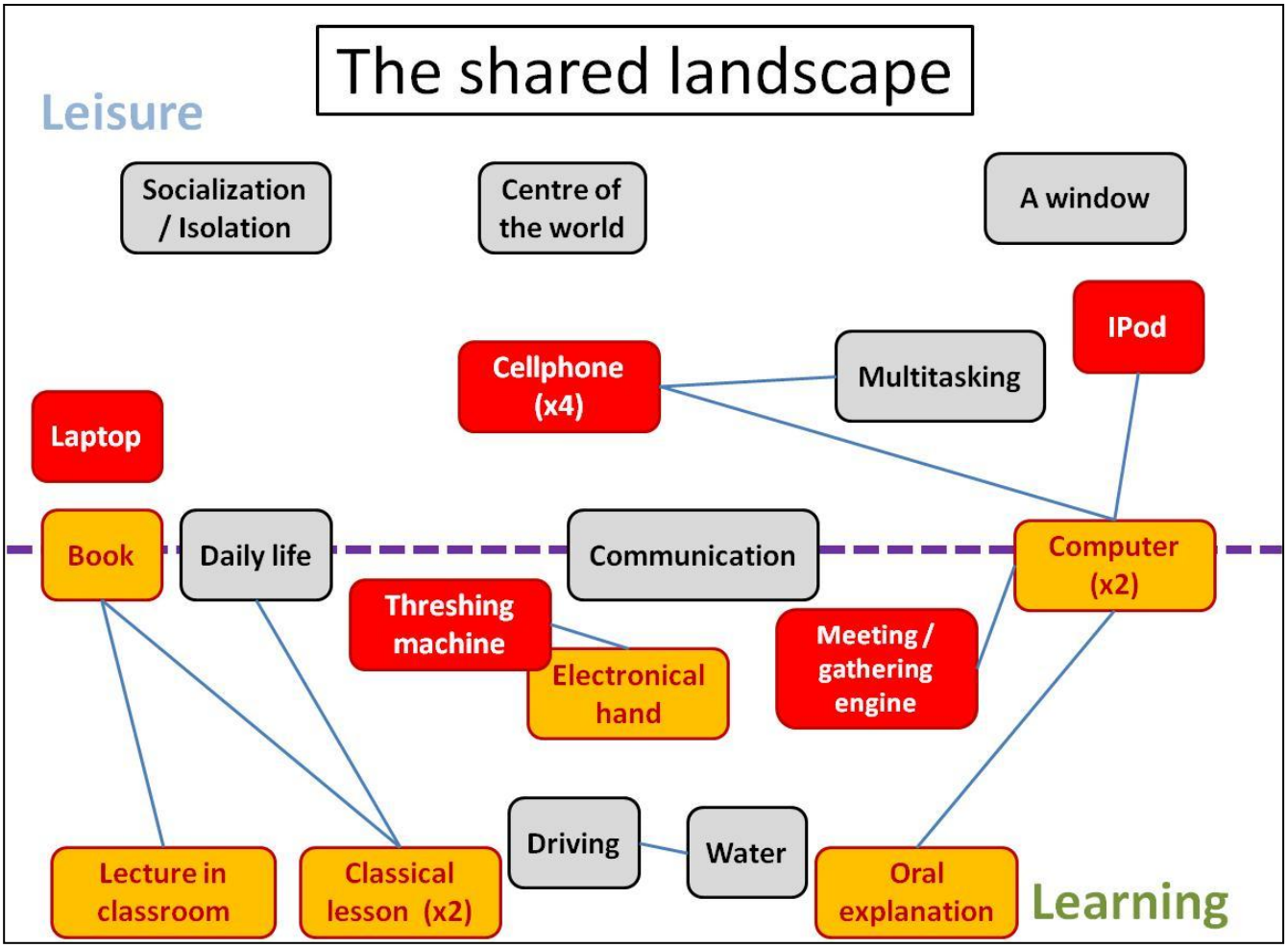
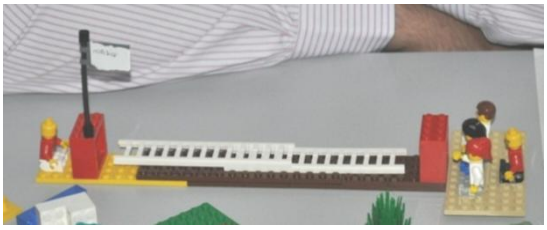


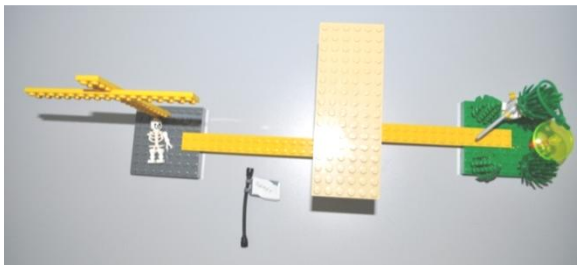
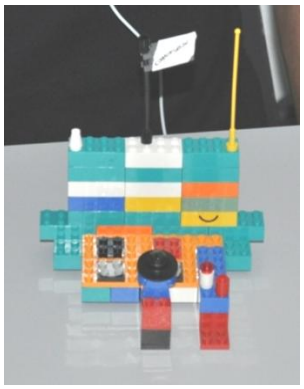
Fig. 78: LEGO session @ communication sciences – synthetic version of the final landscape

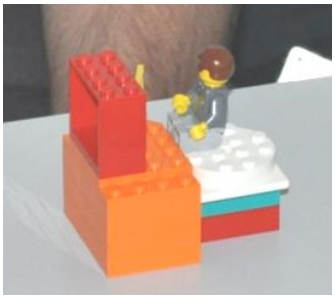
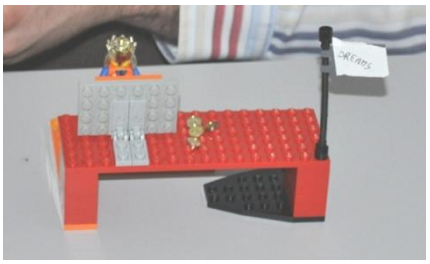
9.1.4: LEGO session @ informatics

Tab. 78:LEGO session @ informatics – 1st step

Build yourself using ICTs (language: English)

KEYWORD	**ARTIFACT**	**COMMENT**
Future		Using ICTs, to me, is working... is preparing my future.
Homesick		I'm studying here, far away from home. Technologies are necessary to stay in contact with my relatives and friends.
Service		My goal is to invent some tool or software which can improve public services, for example the queue at supermarket.

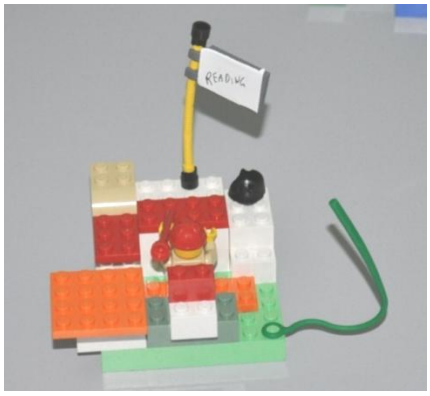
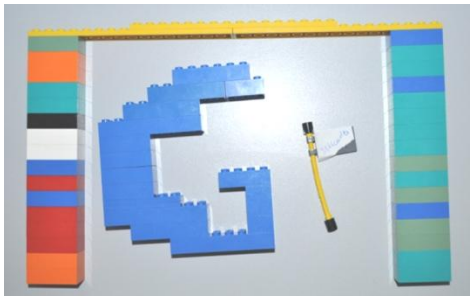
Mobilization		Today, thanks to mobile technologies, you are “mobilizable”,and knowledge is mobile
Slavery		Me, using ICTs? It’s slavery! Everything is asked to me, I have to provide... it doesn’t mind where and when. The skeleton is me.
Communication		ICTs reshaped completely and improved communication. Now, it would be impossible to me to live without.

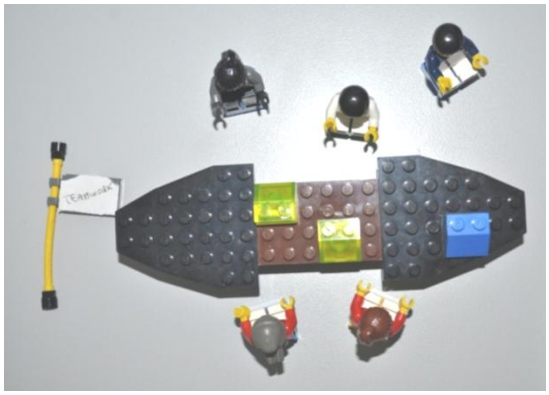
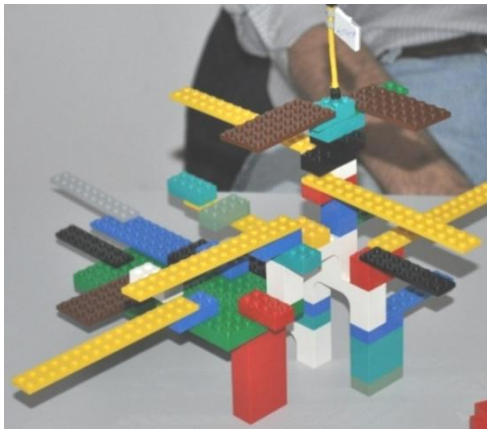
Night-work		Well, technologies are great. But they are driving me to be a zombie: I almost spend all my nights programming codes... yeah, by night, because of quietness.
Games		The best I have ever get from ICTs is playing. My play station, my pc for gaming online, and so on and so forth ☺
Concentration		I use a lot my computer connected to the net, it's great to work, for studying, whatever. But I need to be alone.
Dreams		I decided to study informatics to make my dreams come true. This is me, with my laptop, my ideas, and – hopefully – a lot of money.

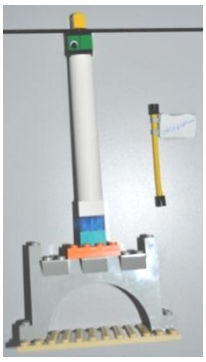
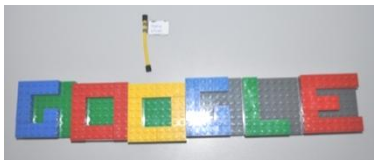
Access		You can’t help to use new technologies: they allow you everything. You have access to knowledge, information... other people.

Tab. 79:LEGO session @ informatics – 3rd step

Build your favourite technology to learn (language: English)

KEYWORD	ARTIFACT	COMMENT
Reading (media convergence)		Reading means: having the book on the desk and an highlighter in my hand, checking on the net what I do not know, using the phone when a I need help, printing materials which are useful for me.
Searching		Google is the faster way to gather whatever information I need.
Inspiration		If I have to study, and to create something, I need to think a lot. Inspiration means my ideas are my favourite way to learn.

Team work		Working together with other people is enriching. Around the table many and different ideas arise. You learn from others' points of view.
Abstraction		What I need is to abstract. To have in mind the best of what I need.
Reading (treasure)		My favourite way to learn is reading. I collect information I need from a jungle of data. The little suitcase is the treasure I get when I find was I was looking for.

Observation		Observation means I can see many things so I can choose what I want to learn.
Search engines		I use to type in the search engine the string of code which does not work. Or the problem I have in understanding something.
WWW		The web is an infinite source of knowledge.
Explore		Learning means exploring. Like an hunter you look around you and you find your learning. And when I got what I was searching I feel like a king.

Thinking		My favourite way to learn is thinking. From my mind an uncountable number of thing can be elaborated.

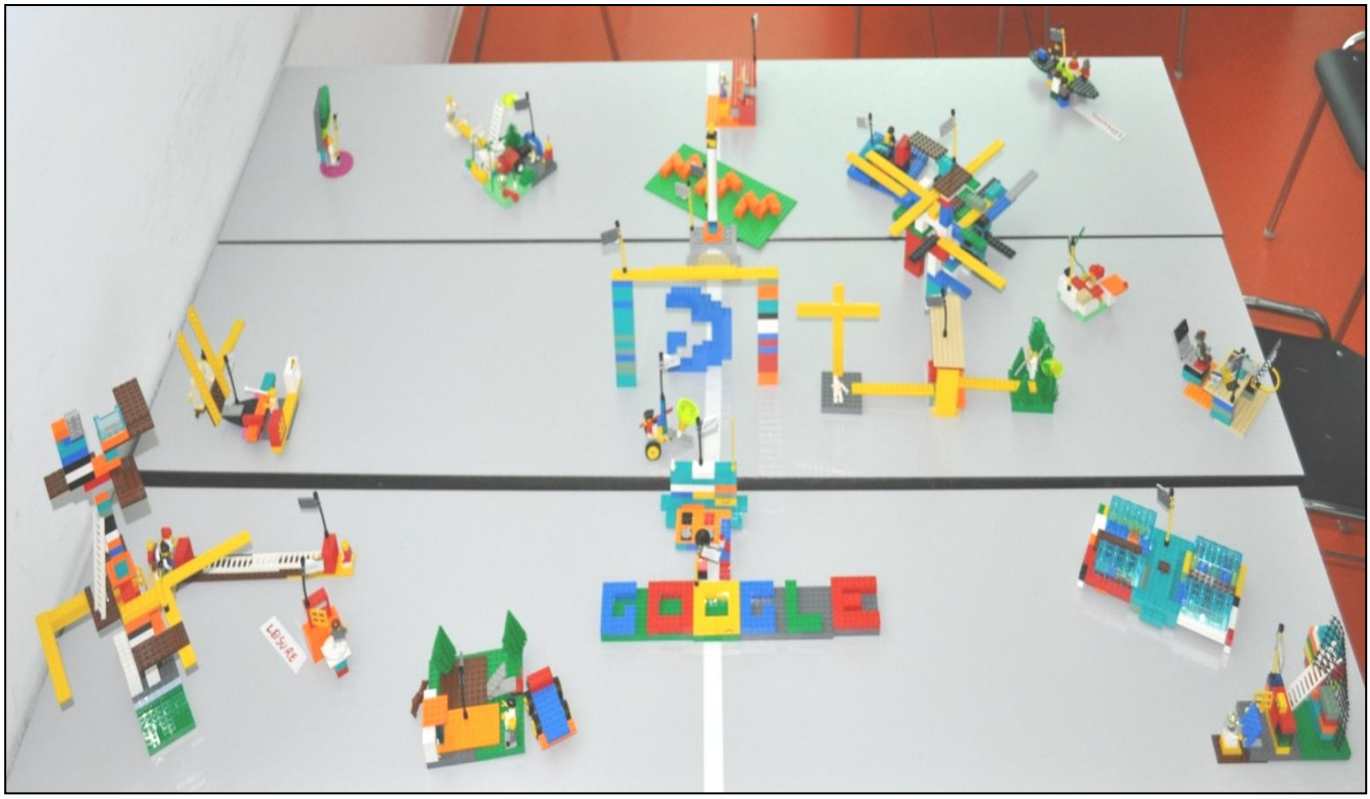


Fig. 79: LEGO session @ informatics – 4thstep

share your creations on a common landscape – split between "learning" and "leisure"

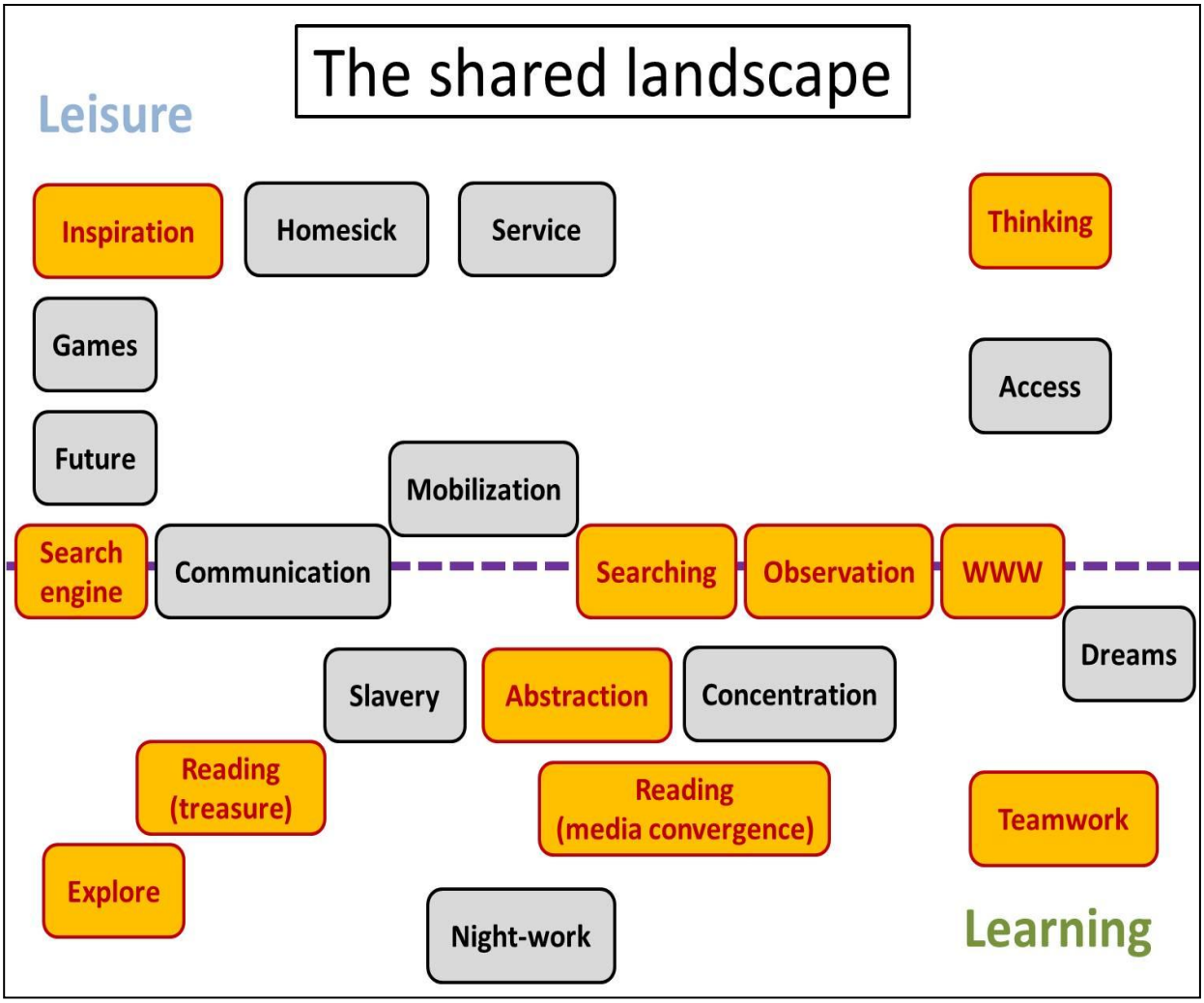


Fig. 80: LEGO session @ informatics – synthetic version of the final landscape

9.2: Materials for quantitative analisys

9.2.1: The final version of questionnaire

The following screenshots show how the final version of the questionnaire looked alike.

As said, itwas created with SurveyMonkey.com because knowledge is everything.

Fig. 81: final version of the online questionnaire – page "1. Introduction"

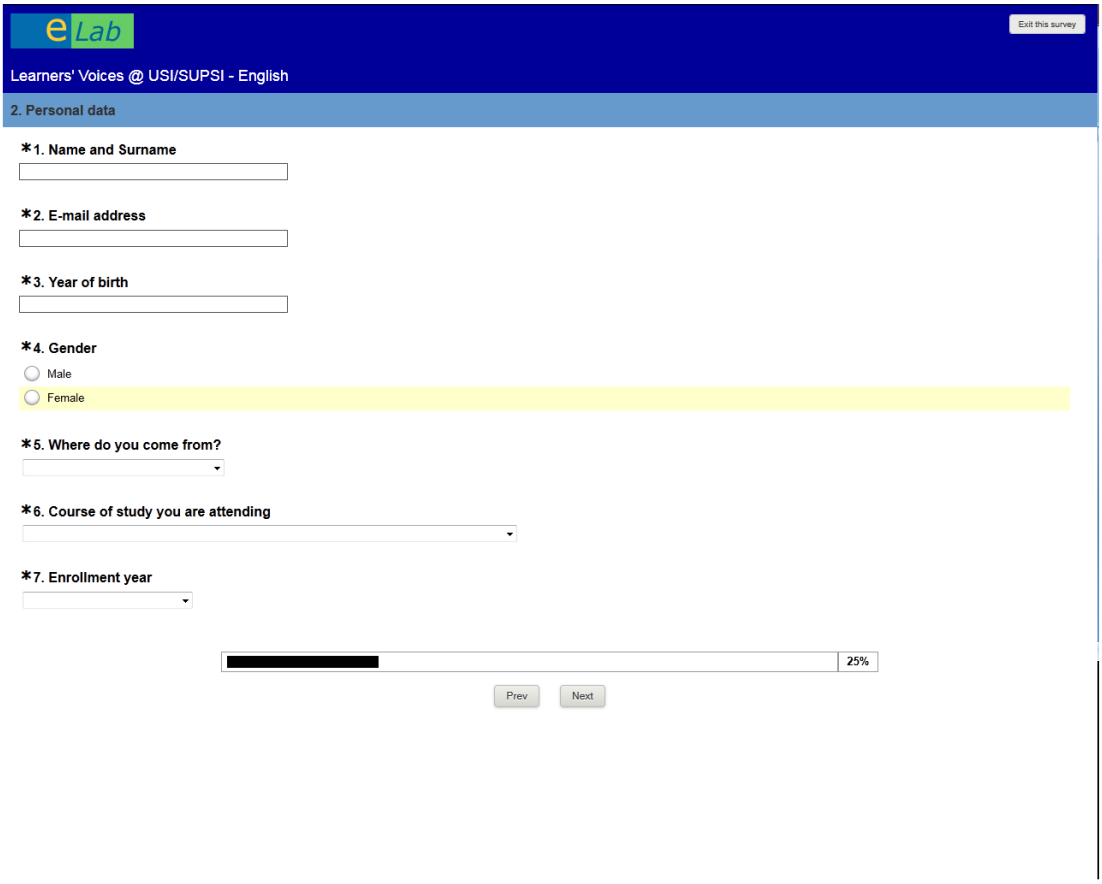
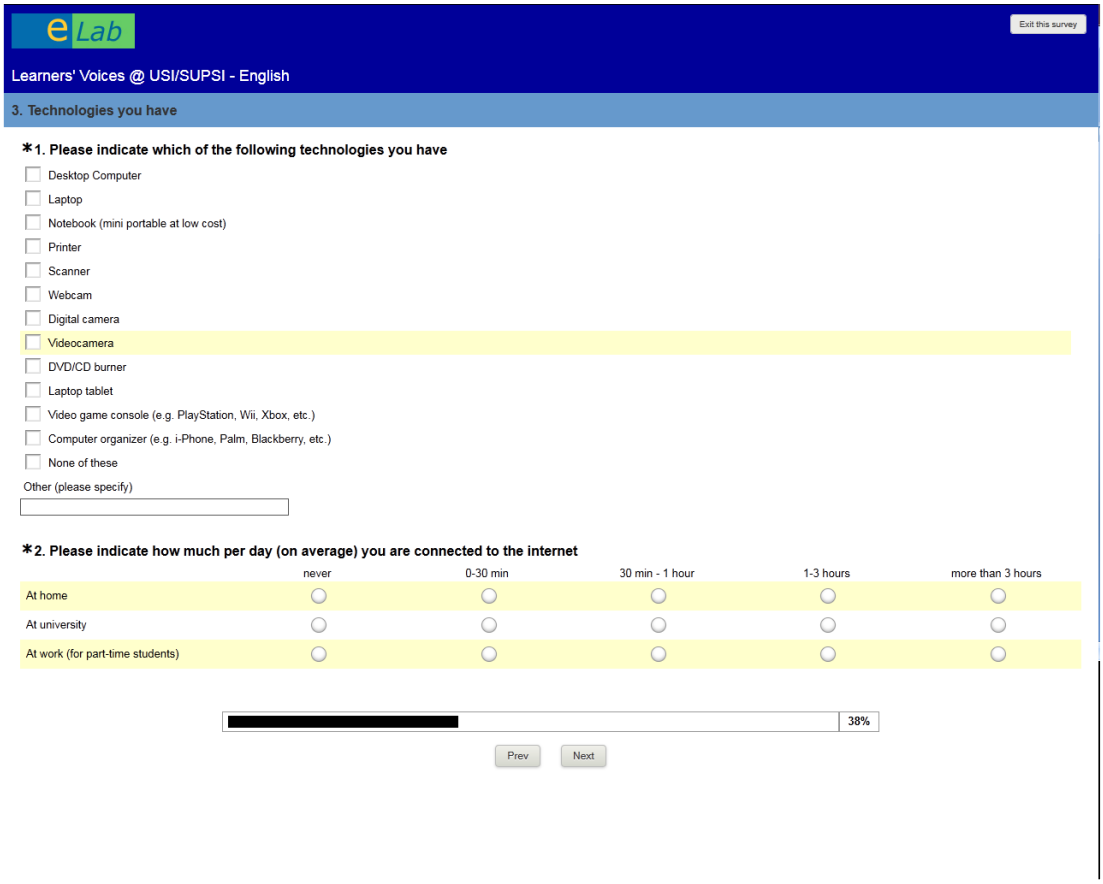


Fig. 82: final version of the online questionnaire – page "2. Personal data"



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Exit this survey

Learners' Voices @ USI/SUPSI - English

3. Technologies you have

*1. Please indicate which of the following technologies you have

- Desktop Computer
- Laptop
- Notebook (mini portable at low cost)
- Printer
- Scanner
- Webcam
- Digital camera
- Videocamera
- DVD/CD burner
- Laptop tablet
- Video game console (e.g. PlayStation, Wii, Xbox, etc.)
- Computer organizer (e.g. i-Phone, Palm, Blackberry, etc.)
- None of these

Other (please specify)

*2. Please indicate how much per day (on average) you are connected to the internet

	never	0-30 min	30 min - 1 hour	1-3 hours	more than 3 hours
At home					
At university					
At work (for part-time students)					

38%

Prev Next

Fig. 83: final version of the online questionnaire – page "3. Technologies you have"

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Exit this survey

Learners' Voices @ USI/SUPSI - English

4. Online activities

***1. Please indicate how often you do these activities online**

	Every day	Every 2/3 days	1 time per week	Every 2/3 weeks	1 time per month	Never
Downloading podcasts						
Downloading music						
Downloading film/video						
Downloading widget/gadget						
Downloading games						
Downloading images						
Downloading software						
Watching a film / listening to an audio						
Writing on your blog						
Reading blogs						
Editing your personal website						
Adding comments to what you read/see or taking part in a forum						
Creating/updating your profile in social networks sites like Facebook, MySpace, Flickr ...						
Tagging contents						
Signing/reading RSS feeds						
Reading/writing e-mails						
Reading newsletters e-mail or alerts						
Grading a product/service						
Using search engines						
Selling						
Buying						
Reading newspapers						
Reading eBooks						

***2. How often you read:**

	Every day	Every 2/3 days	1 time per week	Every 2/3 weeks	1 time per month	Never
Newspapers						
Books						

***3. Please indicate how much time per week you do the following activities**

	Never	Less than 1 hour	1-5 hours	5-10 hours	More than 10 hours
Watching television					
Listening to the radio					
Listening music (cd, i-Pod, mp3 player)					

***4. How much ICT have improved:**

	A lot	Fairly	A little	Not at all
The way you practice your hobby or interests				
The way you do your student's tasks				
The way you learn				
The way you have relationships with your friends or your family				
The way you share your ideas or creations				
The way you collaborate with your peer				

Fig. 84: final version of the online questionnaire – page "4. Online activities"

5. Learning preferences

***1. Please indicate in which of the following places you usually study**

- [ ] At home
- [ ] At home and using a computer connected to the Internet
- [ ] At university, in the studying/computer rooms or in the lab
- [ ] At university, but in unconventional places (in the canteen (mensa), in the court...)
- [ ] Public transport (bus/train...)

Elsewhere (please specify)

***2. When you learn, you prefer:**

	A lot	Fairly	A little	Not at all
Lectures in classroom	○	○	○	○
Individual study (book, classeur, etc.)	○	○	○	○
Individual lesson (face-to-face)	○	○	○	○
Printed dictionary/encyclopedia	○	○	○	○
Multimedial supports (CD-ROM, didactical videogames)	○	○	○	○
Online platform (eLearning)	○	○	○	○
Search engines (Google, Yahoo!, etc.)	○	○	○	○
Websites/specialized blogs	○	○	○	○
Social networking sites (Facebook, etc.)	○	○	○	○
Wikipedia	○	○	○	○

***3. When you have to choose some classmates to collaborate in a group project, which of the following variables are important for you?**

- [x] Competence in the field of study
- [ ] Ability in using new information technologies
- [x] Professional/educational background
- [ ] Previous experience in working together
- [ ] Personal knowledge of the classmate
- [ ] Gender
- [ ] None of these

Other (please specify)

***4. When you interact with your group project, which type of technologies do you use?**

- [ ] E-mail
- [ ] Instant messaging (e.g. Skype)
- [ ] Chat
- [ ] Mobile phone
- [ ] Learning Management System (e.g Moodle)
- [ ] None of these

Other (please specify)

Fig. 85: final version of the online questionnaire – page "5. Learning preferences"

6. Technologies you use for learning

***1. Please indicate what kind of digital technologies and online learning facilities you use in your studies**

- [ ] Digital audio
- [ ] Digital Video
- [ ] Podcast
- [ ] CD/DVD
- [ ] Electronic whiteboard
- [ ] iPod/Mp3 players
- [ ] Laptop computer
- [ ] Desktop Computer
- [ ] Mobile phone (including text)
- [ ] Memory stick
- [ ] Digital camera
- [ ] Scanner
- [ ] Electronic library
- [ ] Search engines
- [ ] Online assessment
- [ ] Video conferencing
- [ ] Learning management system – Learning platforms (e.g. Moodle)
- [ ] Database (e.g. Access)
- [ ] Presentation editors (e.g. PowerPoint)
- [ ] Spreadsheet (e.g. Excel)
- [ ] Word processing tools (e.g. Word)
- [ ] Mind mapping software
- [ ] Modeling software
- [ ] Graphical packages
- [ ] Project management software
- [ ] Simulation software
- [ ] Statistical software
- [ ] Audio Editor
- [ ] Video Editor
- [ ] HTML Editor
- [ ] Image Editor

Other (please specify)

***2. Please indicate what kind of online communication tools you use in your studies**

- [ ] Microblogging (e.g. Twitter)
- [ ] Social networking (Facebook, MySpace, ...)
- [ ] Forum
- [ ] Collaborative documents editing (e.g. Google Docs)
- [ ] Social bookmarking (e.g. Del.icio.us)
- [ ] Photo sharing (e.g. Flickr)
- [ ] Video sharing (e.g. YouTube)
- [ ] Music sharing
- [ ] Documents warehousing (e.g. Box.net, Dropbox, etc.)
- [ ] 3D Virtual community (e.g. Second Life)
- [ ] Blogs
- [ ] Chat
- [ ] E-mail
- [ ] Instant messaging (e.g. MSN, Skype, ...)
- [ ] Wikis
- [ ] None of these

Other (please specify)

Fig. 86: final version of the online questionnaire – page "6. Technologies you use for learning"

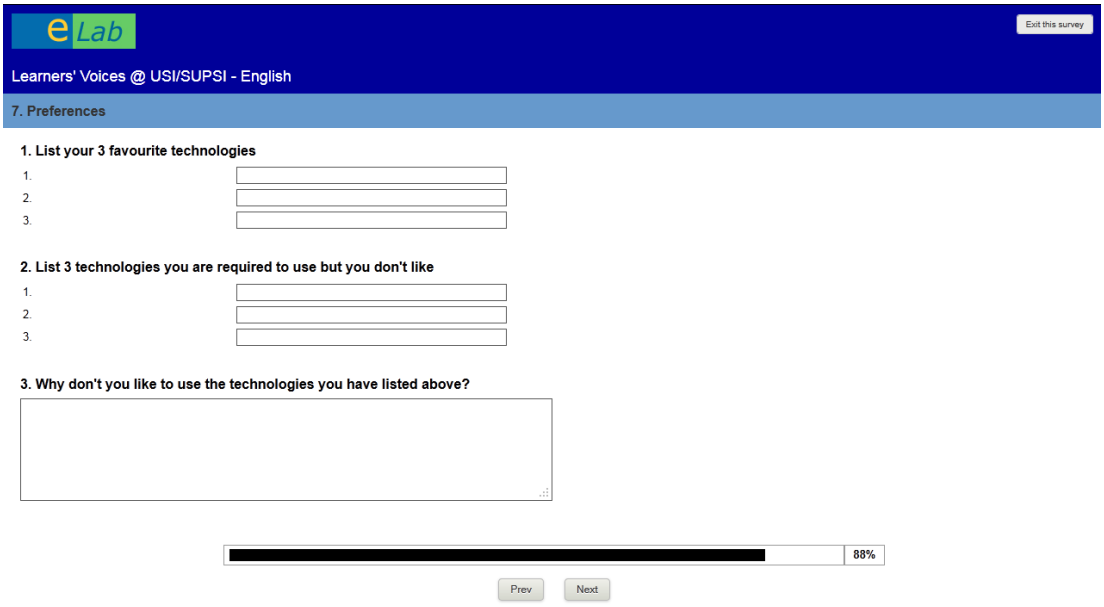

Fig. 87: final version of the online questionnaire – page "7. Preferences"

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Learners' Voices @ USI/SUPSI - English

8. eLearning

With eLearning we mean the use of any kind of internet or online communication services as well as electronic devices that support you in a learning activity.

***1. Please indicate whether you agree or disagree with each of the following statements**

	Agree	Partially agree	Disagree
eLearning is an important element of my courses	○	○	○
Without eLearning I would be unable to study	○	○	○
eLearning is one of a number of important components of my courses	○	○	○
eLearning makes courses more enjoyable	○	○	○
My university is not very smart in the way it uses eLearning	○	○	○
With eLearning I interact more with other students	○	○	○
I find difficult to use a computer	○	○	○
I find difficult to use technological devices (e.g. Pda/mobile phone/mp3 player)	○	○	○
Having access to a computer connected to the internet is a problem for me	○	○	○
eLearning makes learning easier for me	○	○	○
It would be good if there were more eLearning in my courses	○	○	○

***2. In your study you use ICT (Information and Communication Technology) for:**

	A lot	Fairly	A little	Never
Communicating with colleagues	○	○	○	○
Communicating with friends	○	○	○	○
Communicating with tutors/teachers	○	○	○	○
Doing a learning task collaboratively	○	○	○	○
Doing a learning task individually	○	○	○	○
Gathering information	○	○	○	○
Listening to course material	○	○	○	○
Managing information	○	○	○	○
Preparing oral presentations	○	○	○	○
Planning a group learning task	○	○	○	○
Reading course material	○	○	○	○
Revising for an exam	○	○	○	○
Self assessment exercises	○	○	○	○
Viewing course material	○	○	○	○
Writing an assignment	○	○	○	○
Sharing materials	○	○	○	○
Downloading materials	○	○	○	○
Doing purchases online (e.g. books)	○	○	○	○

***3. How much relevant are the following characteristics of a new learning tool for motivating you to use it?**

	Very important	Important	Not so important	Not important at all
Easy to learn/use	○	○	○	○
Opportunity to interact with other people	○	○	○	○
Possibility to share documents	○	○	○	○
Possibility to study/work at distance	○	○	○	○
Easy to access	○	○	○	○
Possibility to use it with the mobile phone	○	○	○	○

Fig. 88: final version of the online questionnaire – page "8. eLearning"

9.2.2:Other graphs

9.2.2.1: USI and SUPSI population

Tab. 80: USI and SUPSI population at the moment of LV@USI-SUPSI

USI population		
ECO	35,1%	814
COM	29,4%	683
ARCH	29,0%	672
INFO	6,5%	152
SUPSI population		
DSAS	29,0%	617
DACD	23,7%	504
DSAN	18,2%	388
DTI	15,7%	334
DFA	13,4%	285

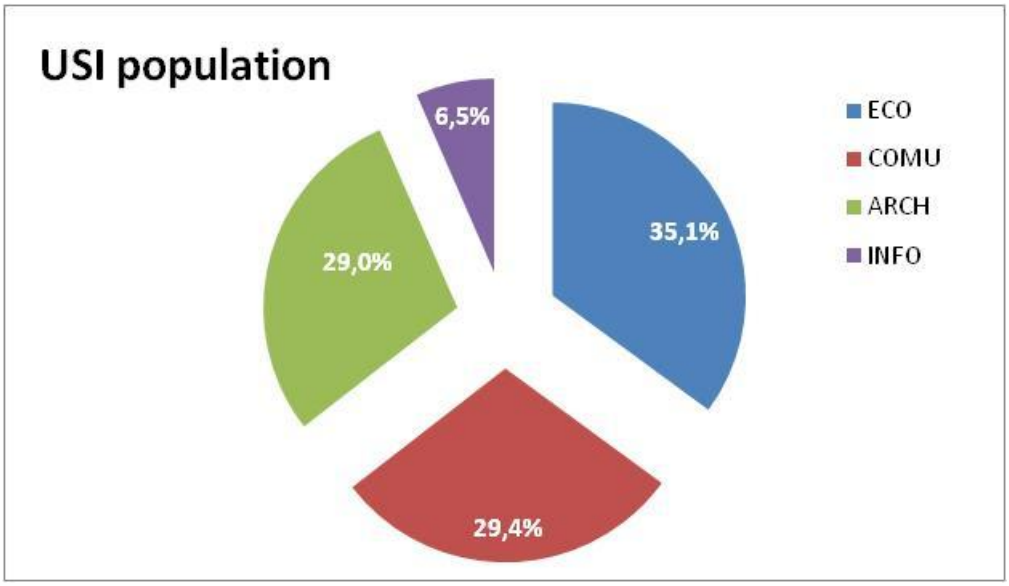

Fig. 89: USI population

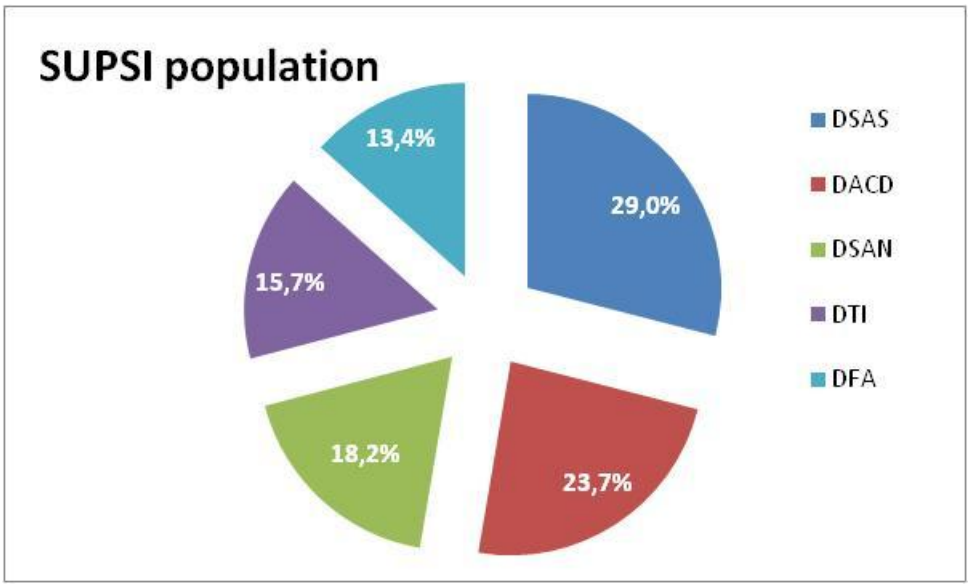

Fig. 90: SUPSI population

9.2.2.2: Frequency of online activities – details area by area

Tab. 81:frequency of online activities – details area by area (q.4.1) - total 517 (45 missing); data expressed in %

	Area	activity	frequency					
			everyday	every 2/3 days	once week	every 2/3 weeks	once month	never
1	Downloading	d. podcast	1,5%	2,9%	6,0%	2,9%	14,5%	72,1%
	Downloading	d. music	6,2%	11,0%	13,5%	17,8%	25,3%	26,1%
	Downloading	d. film/video	6,0%	9,5%	8,5%	10,4%	19,1%	46,4%
	Downloading	d. widget/gadget	0,8%	1,9%	2,5%	4,4%	10,3%	80,1%
	Downloading	d. games	0,8%	0,2%	3,7%	4,3%	13,7%	77,4%
	Downloading	d. images	10,1%	18,0%	16,2%	13,5%	17,0%	25,1%
	Downloading	d. softwares	2,3%	7,2%	11,2%	11,2%	36,8%	31,3%
	Downloading	watch/listen to movies/music	38,5%	20,1%	13,3%	8,1%	9,1%	10,8%
2	producing contents/blogging	write your blog	6,8%	7,2%	4,4%	1,9%	7,5%	72,1%
	producing contents/blogging	read blogs	17,0%	11,6%	8,5%	7,7%	13,7%	41,4%
	producing contents/blogging	update/modify your website	3,3%	4,1%	3,5%	2,5%	7,4%	79,3%
	producing contents/blogging	feed RSS	6,6%	2,7%	4,8%	4,1%	9,9%	72,0%
3	socio-relational use	participate forum	12,0%	15,7%	10,8%	7,5%	15,7%	38,3%
	socio-relational use	social networking	30,9%	19,0%	8,5%	5,8%	13,5%	22,2%
	socio-relational use	tagging	10,3%	13,7%	10,3%	10,6%	11,4%	43,7%
4	comm.inf. retrieval	e-mailing	78,1%	15,7%	2,5%	2,3%	0,8%	0,6%
	comm.inf. retrieval	newsletters	36,6%	23,2%	12,4%	6,0%	7,0%	14,9%
	comm.inf. retrieval	search engine	79,3%	14,7%	2,5%	1,0%	1,0%	1,5%
	comm.inf. retrieval	read newspapers	34,8%	20,5%	12,8%	5,0%	7,5%	19,3%
5	commercial use	sell	1,5%	1,5%	1,0%	4,4%	13,3%	78,1%
	commercial use	buy	1,0%	1,9%	4,6%	10,4%	36,6%	45,5%
	commercial use	evaluate products/services	5,0%	11,6%	13,7%	10,3%	24,4%	35,0%
	commercial use	eBooks	6,8%	5,4%	6,6%	4,3%	13,2%	63,8%
		45 missing						

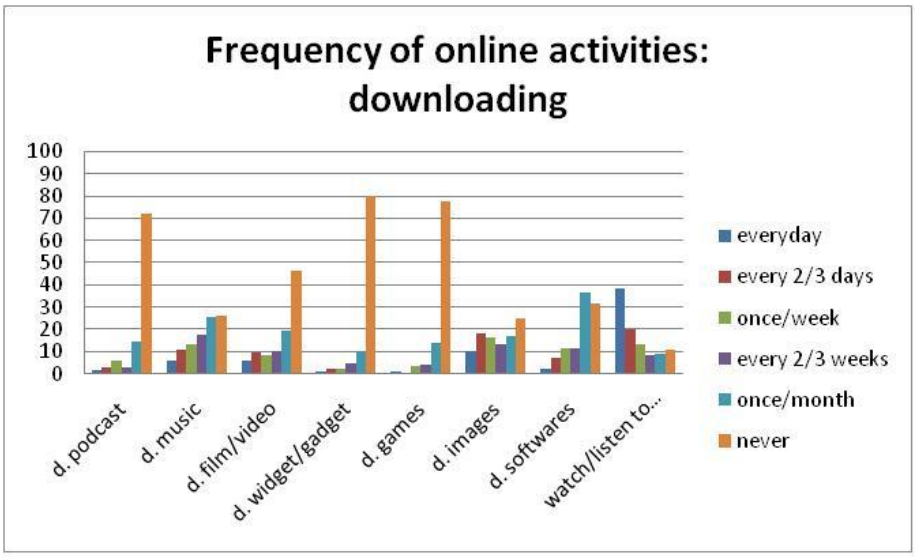

Fig. 91:frequencies of online activities –(q.4.1) downloading
total 517 (45 missing); data expressed in %

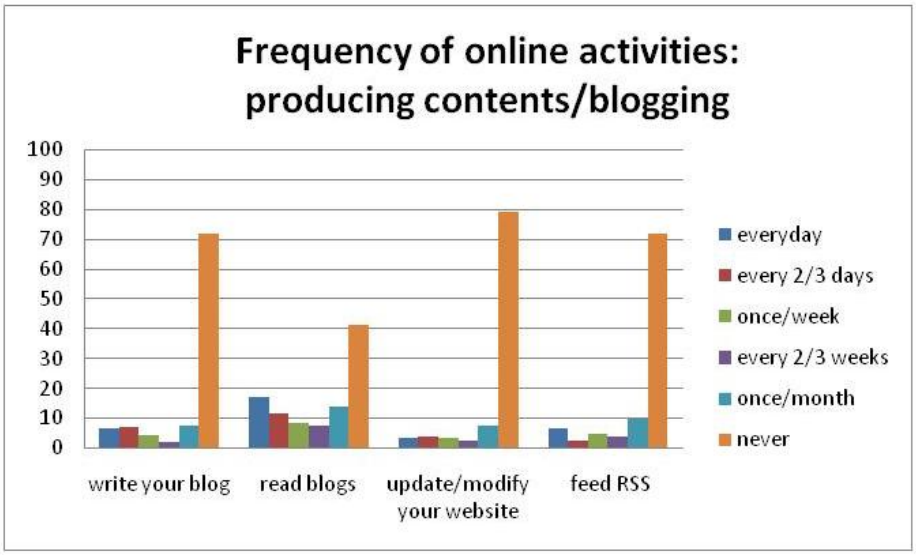

Fig. 92:frequencies of online activities – (q.4.1) producing contents/blogging
total 517 (45 missing); data expressed in %

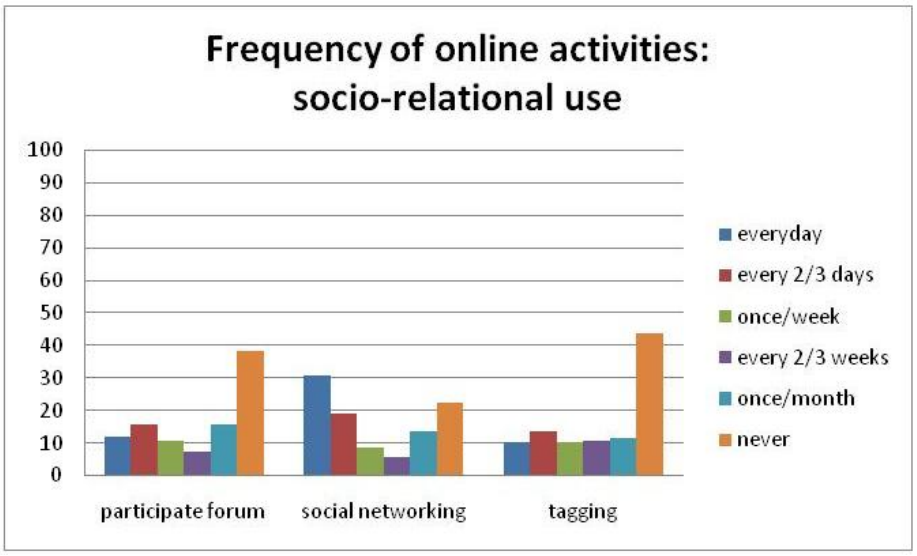

Fig. 93:frequencies of online activities – (q.4.1) socio-relational use
total 517 (45 missing); data expressed in %

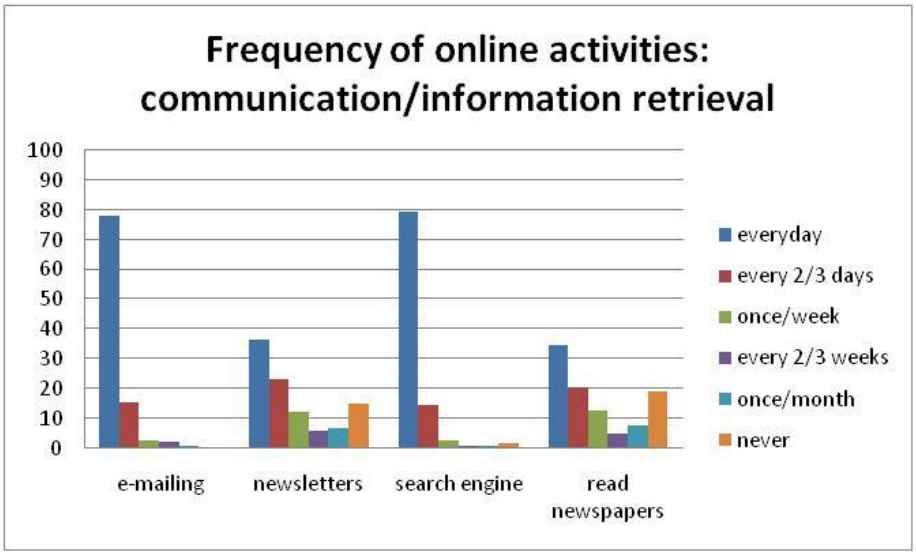

Fig. 94:frequencies of online activities – (q.4.1) communication/information retrieval
total 517 (45 missing); data expressed in %

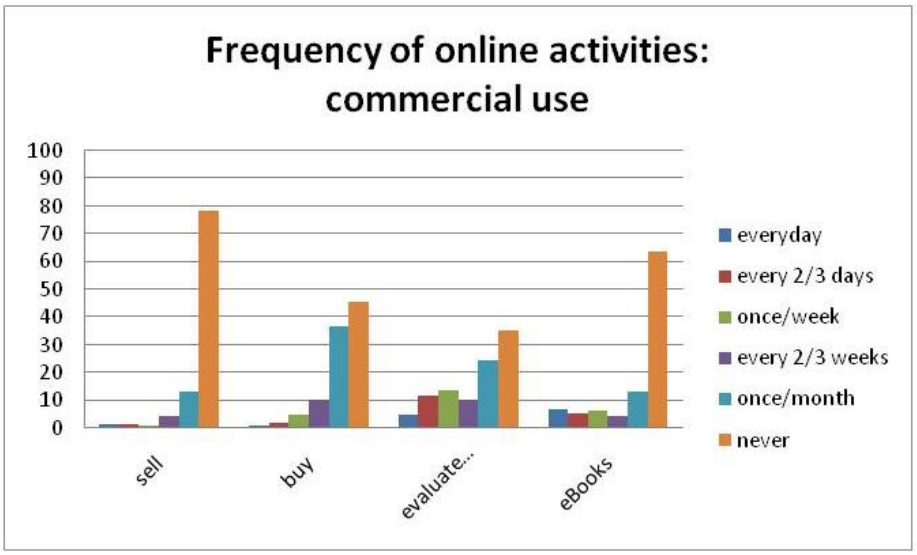

Fig. 95:frequencies of online activities – (q.4.1) commercial use
total 517 (45 missing); data expressed in %

9.2.3:Deepening of some statistical procedures

9.2.3.1: Variables description for factor analysis

Tab. 82: variables description for factor analysis

	Dimension	Variables	Variable description
Socio – demographic	***Demographic***	Age	Age
		Male	male = 1, female = 0
	Countries	Swiss	Respondent comes from Switzerland
		Italy	Respondent comes from Italy
		Fr+De+Ue	respondent comes from France or Germany or other Eu countries
	Education	Humanities	respondent attends a humanistic faculty
Individual characteristics	***Attributes***	Advanced	respondent deals with advanced skills frequently
		Medium	respondent deals with medium skills frequently
		Ictlearning	respondent possesses ICT learning related
	Study preferences	Class lessons	Respondent favours class lessons
		Individuallessons	respondent favours individual lessons
	Behaviour	Commercial	respondent buys or sells products online frequently
		Download	Respondent downloads software or tools online frequently

9.2.3.2: Crosstabulations

At the following list of links it is possible to retrieve all the statistical materials elaborated for crosstabulations:

1. Crosstabs_variable AGE http://db.tt/h3VekljK.
2. Crosstabs_variable COUNTRY http://db.tt/PWuu7dRj.
3. Crosstabs_variable FACULTY http://db.tt/2ZkJdI01.
4. Crosstabs_variable GENDER http://db.tt/J5H9v5Yr.

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