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Perspectives of university teaching  
in Costa Rica in times of digital media

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# Abstract / Thesis in a nutshell

“Perspectives of University Teaching in Costa Rica in Times of Digital Media” examines an educational approach to understand the space of learning that takes place in higher education. For that, a selection of viewpoints of digital media and university teaching are discussed in the light of a tradition: the Journeyman Years. The key research question is: what is a “space of learning” in higher education from the students and professor's perspectives at the Universidad de Costa Rica?

Pertinent to this topic, other sub-questions are: what kind of “spaces of learning” are being offered at the Universidad de Costa Rica? How to reconsider the “space of learning” at a university?”

Chapter Two introduces the ‘Wanderjahre’ [Journeyman Years] story, a leading metaphor for this manuscript where an approach to learning in terms of space is presented.

Chapter Three examines two different knowledge approaches: first, mechanistic thinking is highlighted in relation to digital media. Humans learn of natural phenomena through rational means, seeking to demystify and unveil a true world. Second, romantic thinking is featured in relation to higher education. Individuals learn about the world by engaging in practice while being social, experiencing directly the world in continuous change.

Chapter Four presents an interpretation of the previous theoretical perspectives. After a selection of reviewed concepts, “Learning by Wandering” is proposed, a structure to analyze the construction of the space of learning in higher education.

Chapter Five describes an ethnographic case study of the space of learning at the Universidad de Costa Rica, where 150 students and eight university teachers throughout different contexts are studied.

Chapter Six features the major relevant findings in my thesis to analyze university teaching in terms of space. In this chapter, a list of recommendations for the Universidad de Costa Rica is offered, in order to foster higher education in terms of space.



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## CHAPTER 1. INTRODUCTION

One can only lose one's way if one diverges from a certain path.  
But anyone who has no particular destination cannot take the wrong path.  
(Bollnow 2011)

University teaching is a rhetorical activity, where teachers seek to persuade learners to change the way they experience the world. (Laurillard 1993, 27) To attempt this, our model of education privileges academic knowledge, where students do not learn of the world directly but instead, they learn about descriptions of an *outside world*.

In times of digital media, this model of education seems to have good prospects in technology. Keeping in mind that computers are capable of producing *unlimited* descriptions of the *outside world*, and that their presence among people grows faster, university teaching appears to find in computing machines a useful resource for its activity.

According to UNESCO, by 2013 connected mobile devices were to surpass the number of humans in the world, (UNESCO 2013) and “by 2016, there’ll be so many videos put online every month that it would take 6 million years to view them”, (Ars Electronica 2013) But facing these conditions, what is the relation between university teaching and digital media? Is our education model limited to using representations of the world to have an impact on learners?

In the meantime, it is known that students move on with their lives and experience the *outside world*. Immersed in altering contexts, activities or hobbies, they are natural learners, yet, “those things are rarely acknowledged in educational environments.” (Thomas and Brown 2011, 57)

Is university teaching changing the way these students experience their everyday?

This thesis analyzes the space of learning being constructed at a university in its relation to digital media. In the light of a qualitative ethnographic case study, the space of learning of students and university teachers throughout different contexts at the Universidad de Costa Rica (UCR) is studied.

For this, I first introduce “*Learning by Wandering*”, a metaphor that depicts an educational configuration where learning is closely related to space. Different knowledge perspectives related to digital media and higher education are then presented, focusing attention on key aspects to comprehend different approaches to the way humans deal with natural phenomena.

In the closure, “*Learning by Wandering*” is described in the light of my empirical research, this to introduce an educational approach to examine university teaching, using space as the focus of attention.

The key research question is *what is a “space of learning” in higher education from students and professor’s perspectives at the Universidad de Costa Rica?* Moreover, other sub-questions are of



importance: what kind of “spaces of learning” are being offered at the Universidad de Costa Rica? How to reconsider the “space of learning” at a university?

This exploration is necessary seeing that a good deal of the educational sector raises questions about its endeavor in times of digital media. There is a clear indication that research on teaching and learning methods in higher education is rather new in comparison to other types of formal education, and began only in 1978 (Gros 2007, 3). Thus, this field may be lacking in established experience to treat ongoing discussions related to issues like technological development, in awareness that “potentialities within educational structures may not be as promising as they seem, and the increasing use of the Internet doesn't necessarily imply changing practices or new dimensions of learning” (Gros 2007, 5 own translation) <sup>1</sup>.

In the middle of this challenging environment, the concept 'space' of learning is queried by authors such as Milrad et al. (2013, 107) when they recognize that there is “a shift in our sense of the spaces and contexts in which education takes place”; or Lave (2012a, 167), who discusses the importance of context for the understanding of the creation of knowledge. Others, like Ahola and Hoffman (2012, 205), say that “learning environments are increasingly open and borderless”, and Thomas and Brown (2011, 78) declare that “learning is happening outside”. Sharples, et al. (2009, 246) warn about tension over the existence of “schools being unable, or unwilling, to adapt to the new patterns of learning and social interaction outside the classroom, with young people seeing school learning as irrelevant to their skills and interests”.

Ito, et al. (2013, 87) on the other hand, express that there are emerging yet unfinished approaches to understanding digital media in connection with universities, a work in progress, such as *Connected Learning*, and an invitation to participate in researching, articulating, and building this movement; and Chan, et al. (2006, 6) who in previous years questioned “how will classroom life and everyday life be connected?” All of them insist on the important relation between the notion of *space* and *learning*.

Complementing this, other authors report the necessity of research beyond our current understanding of the topic. In 2013, UNESCO makes clear that “most ICT in education policies were articulated in a ‘pre-mobile’ era, they do not seek to maximize the learning potentials of mobile technology. The rare policies that do reference mobile devices tend to treat them tangentially or ban their use in schools.” (UNESCO 2013).

In addition, the Royal Society (2012, 16) stresses the importance of terminology related to

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<sup>1</sup> “La utilización de las tecnologías de la información y la comunicación (TICs) es un buen ejemplo. A pesar de la potencialidad de las TICs en la formación, la realidad no siempre es tan prometedora como parece. El uso cada vez más generalizado de la red no necesariamente implica la modificación de prácticas ni de nuevas dimensiones del aprendizaje.”

*Information and Communication Technology* (ICT). Although their focus is schools in Britain, it is important to notice their global consideration, stating that “terminological issues in this area and attempts at solving them are nothing new, or indeed restricted to the UK. [...] the problem exists on a global scale, and has no simple solution.” Furthermore, Sharples, Taylor, and Vavoula (2007, 222) disclose that a few educational thinkers have developed theory-based accounts of learning outside the classroom, [...] but none has put the mobility of learners and learning as the focus of enquiry.

Earlier, this breach was obvious to McGregor (2003, 357), who pointed out that “the notion of space being created by social interaction is almost absent in literature about education with the most common understandings of space being the fixed material environment (a container for social processes) or as social space”. In spite of this, reports seem limited to referring to the topic, or describing isolated experiences on how someone has approached the topic in a given environment.

Nevertheless, it seems that with mobile and connected computers a large portion of these considerations becomes noticeable. Therefore it is mandatory for digital media to extend guidelines and define what learning spaces are, and thus clarify its participation jointly with higher education.

Currently, it does appear that in order to construct educational instances, unclear concepts are being shared by universities and digital media.

To illustrate this, a fair level of contradiction emerges as soon as we think of the teacher's role: while it is shown that actions performed by educators are of valuable importance in most backgrounds, some of the latest learning approaches that match technology in relation to space conclude in favor of a self-directed, “teacher-less” model.

Along this line, it is highly questionable to call for a discussion on 'learning' at universities while thinking in terms of “gradually transforming learners into more self-directed individuals being able to carry out learning tasks not just anytime and anywhere, but perpetually and across contexts with and without external facilitations” (Milrad et al. 2013, 96), or to conclude that new developments in digital media should explore gesture-based interaction since “when a learner holds a mobile device, the device will read the physiological state of the learning to detect the learner’s emotions. Based on the emotion of the learner, the device will decide on what the learner should do next” (Ally and Prieto-Blázquez 2014, 147).

Other views reproduce this perspective as they reduce understandings of mobile learning in terms of “usage”, “consumption” and “time”. They describe “an interaction or activity of an individual who uses a mobile device, capable of having a reliable connection to communicate with a mobile learning platform, with the main goal to handle or consume information in an interactive or creative way. Learning is normally done on-the-fly, this means it is very fast and mostly during spare time” (Thüs et

al. 2012, 334). Others also promote Cartesian approaches seeing that “virtual collectives are not bound by physical or geographic constraints, they are generally available to anyone who wishes to participate.” (Thomas and Brown 2011, 53).

Indeed, some other incompatibilities are present within the analyzed literature specially in cases where based on certain terms, learning is considered something to be “delivered” or “transmitted”, hence objectifying a process that cannot be compressed into a tradable good. Not all is conflicting however; other authors such as Sharples, Taylor, and Vavoula raise the core of our task here by questioning “where the ownership of learning lies” just to think later on in terms of shared responsibilities:

“The agency is not with a single individual, nor with the technology; it lies in the democratic synergy between the different parts of the system with the aim to advance knowing. Learning needs to be conceptualized in terms of interactions between individuals, humans or non-humans, which take place in order to achieve evolving states of knowing as they are shaped by mutually (and continuously) negotiated goals”. (Sharples, Taylor, and Vavoula 2007, 244).

In Costa Rica, the lack of literature is proportional to the trend. This shortage becomes even more crucial at the University of Costa Rica where few references appear and basic information is missing. The Programa Estado de la Nación (2011) informs in their national report that “due to insufficient information on private universities, it was not possible to know much about ICT uses in that sector”. This could be attributed to the current national effort in the technological sector, which is mostly interested in first “promoting technological infrastructure by equipping not only computers, but also complete platforms, networks, dedicated staff and other resources” (Programa Estado de la Nación 2011,195 *own translation*).

In documents at the UCR, García, Marín, and Viales (2008, 13 *own translation*) report on the management and employment of TICs at the University of Costa Rica, where they talk of “obstacles for TICs development: lack of clear philosophy about it, inequity in the distribution of equipment among different disciplines in the institution, [...] and for the necessity of policies to prioritize TICs development”.

All in all, the aimed context reflects fairly the tendency in Latin American as Prados and Rivera (2008, 303) report, where “evidence of reflection on ICTs and their impact as mediators in the educative development is non existent.” It is agreed that research is needed to better conceive frameworks able to “integrate diverse communities, to clarify concepts and to promote emergent

spaces able to enhance reflection relevant to the mentioned topic.” (García, Marín, and Viales 2008, 17 *own translation*).

Finally, to explain prospectively in section 5.1, a series of approved motions presented at the 7<sup>th</sup> University Congress at UCR is commented upon. As official documents that explain the line of development for UCR, they are valuable references that demonstrate coincidences with core aspects highlighted in this thesis.

Altogether, it is known that most of our educational institutions plan to include computer usage in hopes of improving practices. However, this initiative seems insufficient. Studies inform us of numerous discussions where digital media itself makes no significant difference, aside from its popularity. Examples of this kind are to be found in Clayson and Haley (2013), who demonstrate problems in students’ performance in a classroom where multitasking and texting occur. Cristia et al. (2012) report on the first large-scale evaluation of the One Laptop per Child project in rural Peru, where no evidence of significant improvement is found. The David et al. (2014), publication on the effects of mobile phones and the interference created when studying or doing homework is on the same line of analysis as McCoy (2013).

In a broader sense, there seems to be a contextual moment that urges reducing gaps in society. Thus, being able to access educational structures becomes fundamental since ideally it embodies a social vehicle for providing paths towards better life conditions. Nevertheless, chances for many are vague and access to social-mobility platforms remains alien to most.

It is peculiar that in times of connected computers, distances of social inequality increase. In Costa Rica for instance, just over 60% of active employees and persons seeking employment for the first time have not completed secondary education and the schooling average for persons between 18 and 64 years old is only nine years in total. In addition, equity gaps based on geographical reasons are noteworthy: while the central region of the country holds 78.7% of university students, no more than 6% of this population remains in the peripheral regions (Estado de la Nación 2013, 205 *own translation*).

With higher education as a social-mobility platform, is there a chance with relation to digital media to reach these left-aside sectors? Should we think in terms of “better technologies” or instead, deepen our understanding of existing technologies and their spaces? (Dahlbom and Mathiassen, 1993, 193) Bearing in mind a growing tendency in favour of tools capable of enhancing mobile experiences, it is also valuable to find out aspects such as “how learning can be managed across life transitions, and how new technologies can be designed to support a society in which people on the move increasingly try to cram learning into the gaps of daily life” (Sharples, Taylor, and Vavoula 2007, 223).

In practical terms, this thesis takes aim at university teaching, specifically to teaching personnel at the Universidad de Costa Rica. By exploring the construction of learning spaces at some UCR scenarios in their relation to digital media, university teachers can enrich their understanding of teaching by recognizing the set of opportunities in digital media for each of their contexts.

Another contribution for university teachers is my “Learning by Wandering” approach, a construct to analyze the construction of educational structures, taking space as the center of attention. With this framework, university teaching may find a new approach to reflect on the kind of learning being promoted throughout university classrooms, and especially at the Universidad de Costa Rica.

Moreover, as teachers are confronted with alternative criteria in terms of learning spaces, new perspectives can be assumed in order to conceive alternative scenarios for learners who live in times of digital media. It is important to note that teachers are directly approached on a first level exclusively because of their current position in the higher education structure, placing them in the role of planners and architects of their lessons. However, it is fundamental for this thesis to reach other actants<sup>2</sup> in the learning space also: students, other communities, stakeholders and professionals in different fields. Once aware, members belonging to these learning scenarios can better understand their crucial role, and with it collaborate with the construction of their learning spaces.

Another level of impact is related to designers, programmers and informatics professionals, since their understanding about the space of learning is key in terms of how harmonic their technical decisions become. To the extent that higher education and digital media draw closer in understanding, the better the experience will be along their trajectories of learning.

The final audience I approach are university authorities. As they explore the topic and the potential dimensions of a learning space beyond its understanding inside the structure of higher education, necessary institutional support must take place, and thus change the current policies which are reducing the learning space in times of mobile, connected and personal computing machines.

## 1.1. An overview on the theoretical foundations

Arguments in this thesis are constructed based on foundational concepts related<sup>3</sup> to the fields

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<sup>2</sup> *Actant* is a term used to expand the notion of individuals beyond the anthropocentric approach. According to Latour, “*it does not limit itself to human individual actors but extend the word actor -or actant- to non-human, non individual entities.*” (Latour 1996, 370)

<sup>3</sup> Whenever I introduce special concepts important to remember, I highlight them in the following way:

Lets think of a relevant concept, I take **space** as instance.

1) *If the concept has not been yet introduced in terms of its meaning, it will appear in the following way:* “The telegraph eliminated in one stroke both time and ‘space’ as dimensions of human communication.”

of *digital media* and *higher education*, both closely related to the construction of spaces of learning at a university. Both are presented assuming two different knowledge perspectives, on the one hand, the stance that tackles the world by fragmenting it, the analytic approach that is well explained in terms of the computing machine and, on the other hand, the viewpoint of a world of natural phenomena to be actively experienced, where human beings are considered holistically, engaged in altering activities as social beings.

To clarify this tendency towards fragmentation, I feature the arguments of the following authors: Bo Dahlbom and Lars Mathiassen (1993) to introduce the computer based on a dialectical analysis between romantic and bureaucratic thinking; Denise Schmandt-Besserat (1997) to explain the origins of calculation as a natural feature in humans; Ernst von Glasersfeld's (1996) learning theory in Radical Constructivism, and Ronald Barnett (2010), in order to discuss the characterization of universities in today's scenario.

These discussions are relevant to explain the rise of computing machines, a tool that came to remediate natural operations within the human mind. To delve into it, the topic of digital media is unveiled on the lines of Marshall McLuhan (1994), Frieder Nake (2008), J. David Bolter, Richard Grusin (2000), Neil Postman (2011) and Peter Weibel (2006), who discusses the post-medial condition based on the historical evolution of tools, remediated into machines and automata.

Relevant to higher education, the work of Otto Friedrich Bollnow (2011) is taken up primarily to define the notion of space and the importance of context. Additional approximations closer to education are integrated: Jean Lave and Etienne Wenger's debate on 'Legitimate Peripheral Participation', a first input that later evolved into new ideas, specifically Lave's 'Situated Learning' and 'apprenticeship' approach, and Wenger's 'Communities of Practice'.

Supplementary arguments to construct a better understanding of *Bildung* are presented, emphasizing Gert Biesta's texts. Yrjö Engeström's Activity Theory is later taken in consideration particularly because of its fundamental role in the 'theory of Learning for the Mobile Age' proposed by Sharples, Taylor, and Vavoula (2007). Moreover, selected notions obtained from Ronald Barnett's analysis of the idea of a university become essential. Also significant is the early work of Diana Laurillard rethinking the 'framework for an effective use of educational technology'.

Other reasoning such as John Seely Brown's is suggested correspondingly with grounding concepts

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2) *To formally introduce a term, its shown in the following way:* "The telegraph eliminated in one stroke both time and »space«. When I write about this term, I understand that..."

3) *If the concept has been already introduced, it will continue appearing in the following way:* "The telegraph eliminated in one stroke both time and *space* as dimensions of human communication."

emphasized here. Finally, other ideas like Richard Sennet's Craftsmanship, and Hartmut von Hentig are included as part of the analysis in the upcoming sections. In all of their cases, experience becomes a fundamental element.

Authors such as Lave are significant, as they present an extensive debate on topics such as trajectories and contexts. She considers that "knowledge" or "knowledge-ability" *must be understood as part of, and as taking meaning from and for, persons engaged as apprentices to their own changing practice across the multiple contexts of their lives*" (Lave 2012a, 167).

Complementary to this position, Lave's interest in space is explicit as we follow her argument inspired by Ole Dreier, where everyday life is transcendental and how "tracing persons' movements across the various contexts of their everyday lives is necessary for understanding how participation changes in changing practice." (Lave's 2012a, 162)

Moreover, Wenger's (2000, 45) reasoning on Communities of Practice is also considered, taking into account that "collective learning results in practices that reflect both the pursuit of our enterprises and the attendant social relations. These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise". One acknowledges then that the learning process develops as a complete manifestation exclusively within social structures.

We understand this social character of learning in its intimate relation with the individual dimension of humans when constructing knowledge. This dialectic relation is significantly described by Glasersfeld (1996, 1), who states in his Radical Constructivism that it "starts from the assumption that knowledge, no matter how it be defined, is in the heads of persons, and that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience".

On the other hand, the argument offered in this document isn't intended to be grounded on approaches based on psychological, cognitive or system theories. While this theoretical "disclaimer" may sound daring especially after the great success of fields devoted to it, I do acknowledge that there is importance in their reflections, specially in fields such as environmental psychology, where the idea of surroundings is paramount in its interplay with humans and objects.

The claim presented by Greeno is also acknowledged with a proposal for a situational perspective in favour of contributions coming from diverse areas and by means of a synthetic effort, to conceive of an agenda in view of theoretical frameworks and principles of practice together. This recognizes that "research on human activity and the practice of education move along separate tracks [...] we should try to integrate the findings, concepts, and explanations of research and practice into as coherent an account as we can achieve" (Greeno and Group 1998, 23).

These possibilities are to be taken more seriously in the near future, this time much more in

connection with the contextual situation at the Universidad de Costa Rica and research communities active there. This thesis is meant as a door to open new debates about the contextual reality of the academic life at UCR.

## 1.2. An overview on the method

Given that (a) the research problem for this study lies within a shared area between higher education and digital media, a method appropriate to free exploration and analysis becomes of importance. As the central phenomenon is highly contextual because of its affiliation to education in its social character, the ultimate aim of which is preparing individuals to become active members of communities, the existing literature is lacking perspectives to better explain research problems and questions. Therefore, the study depends strongly on active setups where participants at the Universidad of Costa Rica interact; (c) it relies largely on collected data that later is organized on key concepts known for both sectors, (d) and relies importantly on my experience collected during five years of effective labour performed within the Departamento de Docencia Universitaria<sup>4</sup> (DEDUN), at UCR.

This thesis then is of an *exploratory* kind. More concretely, the research design is *qualitative*, shaped on the *ethnographic* method, understood by Goetz & LeCompte (1984, 2) as “*analytic descriptions or reconstructions of intact cultural scenes and group*”. Creswell (2011, 462) in his book on research methods considers that researchers using this research design aim to understand a given phenomenon in relation to cultural aspects such as “*language, rituals, economic and political structures, life stages, interactions, and communication styles*”.

Others such as Taylor and Bogdan (1987, 20) identify the ethnographic method as a qualitative trend. For them, ethnographic researchers follow a holistic perspective: they think of people, scenarios and groups as wholes not reduced to variables to analyze. Consequently, the qualitative researcher studies persons linked to their past and the conditions they experienced.

Because of this, the *case study* is chosen to be the type of ethnography able to best deal with the subject matter in this thesis, where the single case study was selected. Savenye and Robinson (2004, 1047) indicate that:

“early efforts often use qualitative methods to evaluate and describe the use of media in the classroom. [...] Researchers often conduct case study to learn more unobtrusively about students, teachers, and trainers who use new technology. Case studies present detailed data that create a picture of perceptions, use, attitudes,

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4 University Teaching Department, own translation.



reactions, and learner/teacher environments. Case study data cannot be generalized; however, they may be used to derive questions later to be investigated in an experiment.”

To collect data, I conducted eleven weeks of fieldwork on the spaces of learning at The Universidad de Costa Rica. The sample covered courses of different fields throughout the Pacific, Western and Central campuses. To collect data, I chose three different instruments namely *participative observation* sessions, *questionnaires* and *semi-structured interviews* aimed to document different perspectives in each of the locations.

To ensure a flexible scheme, I organized short stays in each of the locations, in an effort to improve the understanding of community characteristics at each venue and implement the strategy with this in consideration. This action was of benefit as well since it allowed me to keep in contact with relevant actors, spaces and follow further interactions occurring after official university times.

Most of the records were in written form. To assure academic procedures, different permissions and allowances were consistently issued for each of the visited spaces.

In terms of the observation phase, Brugnoli et al. (2007, 323) mention two types of observation: non structured and structured. In the case of my chosen option, *non-structured observation*, they explain their experience in the sense that non-structured observation allowed them to observe “*participants in a completely “open” manner without the use of timetables or checklists. This form of observation allowed researchers to gather information flexibly, and to extract the richest possible data from the field*”. Reporting on the advantages of this instrument, they indicate the following:

The advantages of participant observation are immediately clear when we compare this option with other methodologies. [...] anthropological research gathers information on the same subjects using direct observation. This avoids the noise produced when obtaining the same opinions through an interview. Another important advantage is that interviews and questionnaires typically gather information from individuals isolated from their social environment. Participant observation allows researchers to consider (and collect data on) individuals as actors and integrated components in their social environments (Brugnoli et al. 2007, p.322).

In total, data was collected out of eight courses from four different study programs. My study is based on one 171 questionnaires, applied and processed, 21 recorded interviews and 22 participative observations attended.

# PART 1 – On Mediating and Wandering

Learning happens naturally in humans. From the day we are born, we experience learning ultimately by *living*. Many times we don't even realize it. Other times, something catches our attention for some reason and we get curious. In that instance, we pay attention and some *mysterious* event occurs inside of us. Then, we learn something new. Yet, learning isn't complete without *wandering* into a new situation.

Learning is heavily contextual. This is why *space* plays a crucial role. When we are in the outer world, we are social animals in danger. Nature suggests that we have better chances to survive in collaboration, being social. Moreover, in the case of humans this possibility elevates them into 'semiotic animals'. In presence of another one like me, I am able to reify into a *thingness* any experienced incident. Thereupon another one like me offers a *thingness* in return. We now *negotiate meanings*. Active, back and forth, I will have new clues that will encourage me to *wander* back into new instances to pay attention to and to reflect on. In this becoming, life goes by. Learning.

Teaching, on the other hand, is not learning; nevertheless, it is known that teaching is one of the activities where we learn the most (Biggs and Tang 2007, 96). When I teach or educate, I intend to change someone I consider equal to, or different from me, by persuading that person to adopt my perspective of the world instead of the one he has. Teaching is carried out by showing *thingnesses* to students who perform within a place I have previously designed. Educating increases the level of intervention by *leading* another to a known point, often constrained within a controlled structure. In their slight differences, teachers or educators share one aspect: both aim to influence learning within others by *mediating* the experience of the world.

Often, it is possible to identify university students unable to relate to passages of 'informal learning' with learning. Enjoyment isn't necessarily associated with any kind of learning; some might even say "not serious". This necessarily changes as soon as one enters a campus, a classroom or a school. The university is the institution where one goes to learn, where learning events are prepared that present

us with formal episodes, *descriptions of the outside world*, experienced by someone else. This might be one of the greatest and oldest challenges for any educational system: how to create spaces of learning intimately related to student's everyday life? It is by no chance a simple task as the space of learning refers to a world of constant change, happening ubiquitously, contextual. How are these spaces connected?

To embark further into details, I introduce a story to begin my reflection<sup>5</sup>. In it, you will find plenty of illustrative concepts that describe the basic configuration of the 'Wanderjahre' [Journeyman Years]. Some will be clear; others will be explained later on.

## CHAPTER 2. LEARNING BY WANDERING: A METAPHOR FOR CHANGING PERSPECTIVES

It is 2015 in Germany. A journey of a special kind is about to begin: away for no less than three years and one day, sometimes even longer; a time span to grow into a craft beyond limits, to learn new lessons, a challenge to test the human, the craftsman, the wanderer. A *Geselle* [Journeyman] sets out on *Wanderjahre* [Journeyman Years] to discover new, beneficial scenarios.

Beyond his town, new *Schächte* [guilds] will be present, however, neither plans nor routes are fixed, save for learning on the move. It is a tradition that dates back to medieval times, the original form of "Work-and-Travel". The *Geselle* is different, true to a free work life with neither mobile phone nor home.

It is time to depart. Family, friends, brothers and sisters from the guild gather in the outskirts of town. The tradition involves climbing over a street sign, not any but one that indicates the town's boundary. The *Geselle* ascends from this last piece of land he belongs to, where everybody stays behind, and then falls into no one's land, alone, single with no children crying in farewell. From here on, he will walk or hitchhike, no public transit is allowed.

Among the few elements he carries a *Geschenk* [gift] in his pocket. It is a limited amount of

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<sup>5</sup> This story is an adaptation created after different sources. I got to know of the 'Wanderjahre' [Journeyman Years] during my time of studies in Germany, as the traditional 'Geselle' [Journeyman] walking the streets of Bremen, or any other city, are quite noticeable because of their clothing. Through informal contact with friends and families born in Germany, all of them aware of the tradition, I came to collect a bunch of complementary descriptions. My main sources to create this piece however, come from an article written by Oliver Hollenstein (2013) and a documentary filmed by Julia Daschner (2009). In a later stage, I came across the Hessischer Rundfunk website (Vogel 2013), where they have a rich collection of information around this topic. In all of the cases, sources are available in the German language.

currency to be used strictly in case of emergency. He is also equipped with a map, on which a 50 km radius is clearly drawn. He is not supposed to cross into that circle, at least not during his Wanderjahre. It would be considered too close to home, the place he must stay away from. After this, he won't return the same.

This map also contains other information. In it, the Geselle is shown key locations of interest suggested by the guild. He is told that work opportunities and new communities are to be discovered there. In these places, alternative practices and techniques are being implemented, a precious lesson for a craftsman.

The wanderer relies on his senses and intuition during the journey. As he strides determined, he remembers that day of initiation back home. Sitting on the river bank, two brothers and one sister of his guild cast primary elements: earth to water, fire to air. This is a reminder to them all, because one who builds with the knowledge of his hands must be aware that raw material is about properties.

In the hands of a craftsperson, raw material is never silent; it has a story and is full of affordances. In the wild, he must be able to discover it, acknowledging its unique nature in the process. Each stroke has a rhythm, a hidden melody. Craftsmen do not just produce; they also make something unique out of the many possible. Two brothers and one sister repeat this to a new brother. But among them only one is in charge of casting the words of initiation.

*“You'll give up your name  
from now on your name is your skill.  
Your comrades are your family  
I'll honour them as brothers and sisters.  
I won't make judgments about the life nor faith  
nor the origins or religions of other people.  
You'll realize that travelling will  
become part of you.”*

Each Geselle learns a craft. A roofer for example, can't perform his work during winter because weather does not allow it. This is why summer means hard work in order to save money for the road. Winter is for travelling.

Along the path, the Geselle sees the world. Some contexts will create stronger impressions, where impoverished people suffer under desperate conditions, for instance. However, times can be merrier, such as when they meet others of their kind and share the road. Together, Gesellen sing special songs as they enjoy and share the road. In this tradition of decades, they meet and belong.

Along the uncertainty of the journey, a Geselle does not carry much. This is a rule from experience,

because one on the move bears no heavy burden; just what is necessary to learn beyond. In a knotted *Charlottenburger* [shoulder bag] everything fits: a compass next to his map will show the way, a set of tools to work a craft are included, along with some fresh socks and underwear, a couple of t-shirts, one swimsuit and trousers on the bottom. These are fundamental conditions for undertaking a journey on foot, aware of a physical frame. By the end of the *Wanderjahre*, the burden on his shoulder will be half its original weight. The *Stenz* [wanderer's staff] in his hand will nevertheless remain.

Depending on a guild or their craft, each *Geselle* has a special *Kluft* [clothing code]. External signs become narrations, readable for those able to read.

Strictly, the colour of their coat, pants and jacket announce the material they are devoted to.

Black is for woods.

White or brown is for stones.

Blue is for metal.

Attached to their outfit, the number of buttons represents time.

Eight are for the working hours a day, fastened to their coat. Six come attached to the jacket, because these are the workable weekdays. Three are still to be seen on their right sleeve, the same as with the left one. They speak of the number of years as apprentices, followed by another three when they embrace a journey; times of *Wanderjahre*. Initiated *Geselle* will have a tie. A red one for instance, is known for a certain guild.

But red means honourability likewise, and honour must be earned. The chance to prove it comes shaped as a rite, one they must surmount to deserve this distinction.

This brave *Geselle* with a red tie was worthy of it during a farewell party. That day, a guild brother dressed in blue came along with a self-made nail. It ended up drilling the left earlobe of the tested one. Honour in red was immediately granted.

On the road, working for shelter is a common event. But shelter, home, is a non-fixed element. Their belief in their craft is their house, and through the journey they get to learn what this means. The world is their house. But there are others, different for them. In the world, they coexist with it, and even though they may be *fremd* [foreign], they treat everyone respectfully.

All *Gesellen* are learners. When they meet in community, old and young, *Meister* [master craftsman] and apprentices share their interests in a craft. A master will look after the apprentice; he takes him under his wing and he shows him of dealing with enterprises. At other times, a *Geselle* leaves for new places, not necessarily under the guidance of someone belonging to his or her guild.

Once their work is over, *Gesellen* know the special places where they can trade, make new contacts, learn of job offers and places to sleep. In a *Herberge* [Hostel] they can meet other brothers and sisters

who share a life of craftsmanship. They often live in special accommodations meant for the labour force. They pay taxes and receive a fixed wage for their services. Many years ago, they performed their job mainly as a requirement to be promoted to become masters. Now, the tradition has caught up with the reality dictated by a context. But not all is just work or sleeping. In every city, special pubs are known where most of them go and share drinks. There they belong to communities, they laugh and celebrate.

On their trajectories, their paths may change suddenly. Sometimes a Geselle will decide to take a road into the woods. Or sleep alone in a valley.

The Geselle will also go overseas. No harbour in mind. Maybe even a job on board, offering maintenance to the watercraft.

If they know of an opportunity, they will stay in foreign lands, where people unable to speak their language will try to communicate. The Geselle will try to answer. When the attempt turns into tribulation, an illustration is always a way out. Their journey is shared with daring situations. To be secure is not their ultimate desire.

Each Geselle carries a *Wanderbuch* [travel book]. It is a record of all their experiences. Within the pages of this diary one will find new understanding, discoveries, what the Geselle sees and what he or she is acknowledged for and worthy of. It is an official document, where employers and teachers testify to the evolution of the moving learner. This will be a memory device to be saved. Once the journey is finished, all notations are revealed to brothers and sisters. This is then a collection of signs and reflections, a sequence of fragmented scenes, which with any luck, will serve as landmarks to later reify the experience through words.

During their *Wanderjahre*, Gesellen dwell in their rituals full of codes. There, they belong with brothers and sisters in their journey. Exposed to what may be foreign and uncomfortable, they retain a special system of signs and sounds some called *Zinken* or *Gaunerspache*: special symbols recognized just by them, a semiotic layer, shared and disguised in current society: marks in the ground, on a wall, in front of a friendly house. They share their discoveries for others to continue on their way.

Sunbath in July. Over 100 people gather, and waiting patiently they smile and chat on the same spot where it all began. Three years and one day of *Wanderjahre* come to an end. Today one of their own returns home. The tradition involves a last effort. The Geselle approaches the town's boundary sign but this time, differently, he will be assisted by brothers and sisters of the guild. Over the street sign he does not fall alone, but into the arms of the family and friends. They all now celebrate his homecoming.

At night, around a bonfire they all reunite. Curious and excited they become silent. The wanderer

inhales a deep breath of air and smiles. He is now ready to read aloud his Wanderbuch. Every single detail recorded in his travel book is finally revealed. Everyone listens carefully, from the beginning to the end of his pages. It's time to celebrate life.

The "Learning by Wandering" metaphor should be kept close, entwined throughout the lines of my manuscript. Little accents of it may grow into bigger discussions, in the light of a figurative vision for the space of learning. It stands for a possible educational structure, strategy or initiative able to support the process of the apprentice. He is that student we know well, trusting his education in one place of learning at a university.

In an early state, after engaging in new attempts and altering scenarios in life, the learner determines a cause to follow. Home and security are already known. It is where he belongs and his bed will always remain. But now a thirst for *natural learning* grows in the learner who passionately embraces certain enterprise(s) to experience them further. This is his journey now.

The spirit of the "Learning by Wandering" metaphor finds its core in the German concept of *Bildung*, as the ideal of education formulated by scholars like Wilhelm von Humboldt (1767 – 1835). He proposed a model for the creation of a humanistic system in Prussia. In *Bildung*, the one who wanders is the humanist, a human constructing himself in knowledge and wisdom. Johann Wolfgang von Goethe (1749 — 1832), another influential figure who contributed to the construction of the humanistic project during German romanticism, explored the topic in his famous *Bildungsromane* [novels of formation], where he deliberately linked the idea of *Bildung* with *Wanderjahre*. In *Wilhelm Meister's Apprenticeship* and *Wilhelm Meister's Journeyman Years*, Goethe investigated the concept as he proposed "a form of human cultivation that takes full cognizance of the worth of the individual, refusing to subordinate that individual to external ends" (Cusack 2008, 24).

This historical Geselle appears foremost in our metaphor, an allusion to consider when we think later on about the importance of educational approaches in the mode of student-centered learning. On the other hand, considering his origins, this figure is to be found in different manifestations throughout Europe. For it, Germany's *Wanderjahre* (or *auf der Walz* [on the tramping]) is the portrait this research pays attention to. In general, the Geselle belongs to the structure of *guilds* and *journeymen* that existed in Europe since medieval times. From country to country, they present unique characteristics that are highly dependent on their affiliations to crafts communities. Wadauer (2006, 180) describes the essence of the Journeymen's travel and their General Education system as follows:

"A journeyman had to cope with partly contradictory requirements: to act as part of a collective and yet simultaneously to operate as an individual in the right way. He had to gain experience as a craftsman, and also achieve knowledge of human nature

and the world. This required prior knowledge and some freedom from material constraints.”

To understand properly the idea of the Geselle, it's necessary to mention the notion of *Wanderung* [wandering], as it comes intimately related with the spirit of the epoch. Studying the West Germanic origins of the word “wander”<sup>6</sup>, we see that it is connected to *wend*, a word that has associations both with English and German. In the first case, it means “*to go in a specific direction, typically slowly or by an indirect route*” while in the latter it refers to *turn -something- around*.

On the other hand, “wander” is connected to ‘wind’, another term related to English and German. In the first case, it refers to move in or take a twisting or spiral course: *the path wound among olive trees*, while in German it means to *spin, to turn something around repeatedly*. Otto Friedrich Bollnow (2011), one of the main theoretical referents for my study of *human space*, expresses that *wandering* is related “to a leisurely, lengthy and coherent movement on foot from one place to another, not driven by urgency or undertaken for some external purpose” (Bollnow 2011, 106), a *leisure* that I echo in the original sense of the Ancient Greeks, as their word for *school* indicated *leisure*, as I will later discuss. In short, Bollnow describes the wanderer's spirit by quoting Manfred Hausmann:

The wishful dream of all travelers is the arrival. Being on the road is unimportant, indeed superfluous, indeed positively wretched. The wanderer on the other hand knows nothing of arrival or of a destination. Whether he strolls through Norway's windless valleys or through the cities' allotment gardens ... He knows neither why nor whither. Wandering is subjective, aimless and uncertain. For the wanderer, it is not the arrival that is important, but the wandering, being on one's way, the road. (Bollnow 2011, 110).

A fundamental difference has to be noted. Every Geselle is in a way a wanderer; yet not every *wanderer* is a Geselle. The romantic wanderer remains lost in reflection, uninterested in reasons or destinations because “wandering is a purpose in itself” (Bollnow 2011, 108). On the other hand, the Geselle is a wanderer within a cage of rules, codes and old traditions. Guilds, as communities of practice in Wenger (2000), are a fabrication of man to condition the terms of this learner's expansion, but there is enough place for him to perform. In this case, in Wadauer we notice the difference with the loner, because for him two dimensions of mobility are to be described. He understands *travel*, associated with “tramping for general educational aims” different from wandering, in his mind, the

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<sup>6</sup> The series of meanings around the word wander were collected from the Oxford Dictionary. (Oxford Dictionary 2013)



dimension related to “tramping to gain craft skills” (Wadauer 2006, 175).

My idea of wandering also takes ideas from Wadauer’s analysis, since with the Geselle, wandering is not necessarily aimless but engaged in meaningful practice. Our learner in the story is comfortable in situated ways of learning in the outer world, where the social is fundamental according to Jean Lave and Etienne Wenger. However, a vital characteristic of wandering is the possibility to shrink back into oneself, as the journey is not one that takes him to the next city on the map. In this possibility he can escape into his experienced space, away from “the over-increased purposefulness of his existence” (Bollnow 2011, 112).

These passages of retreat are easily achieved while immersed in the joy of all senses, recognizing himself in a direct relationship with nature, a state of *intimacy* that is “ascribed to the countryside itself” (Bollnow 2011, 114). In rapid times of digital media, this “retreat” of intimacy must be provided by *any* design of men.

Our Geselle prefers the paths described by Bollnow. When there is no ride to take the quick way, the wandering learner prefers quiet meadows. This exercise is useful to engage in reflection, different from a loud and fast road. Learning moves time aside anyway, for experience is always in need of space. But one always has to keep in mind that both a path and a road, are *human manufactured*. They serve well as networks in favour of civilizations prosperity. In fact, many routes were there before papyrus and alphabets, and they were built to speed-up human life (McLuhan 1994, 90).

The Geselle, unfortunately, isn’t concerned about speed. He cares about roads only in the sense that they are networks connecting him with others in distant communities. Roads in a way are close to those places of learning designed by teachers and educators, for they are not natural but manufactured. However, it may be that certain designs connect us from one activity to the other, where a new guild developing exciting techniques is.

In Germany, the expression *roter Faden* [red thread] refers to a traditional expression meaning “the guiding idea”, which indicates the importance of a red path, a metaphor that stands for a guiding idea that crosses throughout a text in order to assist the reader not to get lost in a jungle of ideas and words. Notwithstanding, a trail fits better the wanderer pace. While on it, he cannot “lose one’s way if one diverges from a certain path, [...] as anyone who has no particular destination cannot take the wrong path” (Bollnow 2011, 111).

But what is it that vitalizes the spark that sets this Geselle into motion away from home? Certainly curiosity and thirst to expand his practice play a decisive role, but there is one fundamental element: longing for distance. When the learner expands, he aims for that which is distant, potentially in reach but manifestly not here. Never at home where security is assured.

There, in the distance, hidden scenarios are happening next to intimidating alien elements glowing in the outer world. He doesn't know it yet, but on the journey these are important for his Wanderjahre. What is distant lies beyond the boundary of his community, a place that now becomes too narrow. Beyond the surface of comfort, in his skill he finds a new home in change and being active. The system of learning is capable of supporting this, but for that, the individual is the only one able to set all in motion. Bollnow describes the idea of such a system as follows:

Space acquires objectivity by becoming a common system of relationships. The relationships of nearness and distance that are attached to things, permeated with emotional values of the most various kinds, fade into the distance that changes according to where one finds oneself at a particular time. (Bollnow 2011, 99)

The human design will be there to support him, to serve and to fuel his decision. Control is not necessary, as the path of the wanderer is limited by the terrain he confronts in connection to his own physical possibilities. Such a frame is always a condition for the changing pace one can have, always overpowered by both the path and his stroll. And when walking under the blue vault, night will fall and he will be forced to think about shelter. Time is a clear sequence, as it is imposed by our nature. Under such conditions, this learner may avoid suffering from any social *jetlag*, where no speculation will affect the natural synchronization of "clocks" between the *body* and the *sun* (Roenneberg et al. 2012). The Geselle is therefore analog, one experience in front of a phenomenon. His mental processes take care of the digital. A new day will come in just a few hours, where a craftsman's atelier awaits.

Throughout these trials a wanderer expands, and continuously aims for the distant, one that can be either 50 km away from his hometown or in the tropics, overseas. The expanse of the learner grows and shrinks as desired by him. All the same, the path may be full of detours leading to unknown places of potential interest, he is up to exploration. These decisions cannot be made under a narrow *curriculum*, but on a movable platform that assists learners on the go.

A *map* and a *compass* are in terms of Marshall McLuhan, *cool mediums*<sup>7</sup> in need of human intervention. Since they present so little information, active interpretation of humans is needed. However, both of them are highly effective in their aim: support the Geselle in his sense of location whenever needed. They are the threshold to commute between reflection and practice, individual and collective or reification and participation, in terms of Wenger. These tools are meant to augment the experienced space, one that is lived, body and mind, doing and reflecting. The "learning by wandering" metaphor couldn't exist without the clear integration of a learner's physical dimension. It was with his

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<sup>7</sup> A term to be discussed in p.59

senses that he felt the water when initiated, and his physical features allowed him to climb over a street sign into wandering.

The learner experiences a world in constant change. He is sovereign in every decision, every detour or enterprise he undertakes, behind each are potential lessons as he goes. With all senses attentive, the Geselle writes regularly in his record machine, whenever he feels it necessary. A Wanderbuch is not just a diary. It is the arena for him to practice written code. In it, he may collect and prove later to others the marks of a trajectory, but most important, inking memory on paper.

Simple and customized, this element will preserve other valuable documents as well. Both an employer or master may contribute a letter of recommendation to his Wanderbuch. They will write about his duties, and of what exactly he did, his skills, his commitment. This is an official document to be examined later by the guild, not to be traded as a grade, but to tell a story for the full, active members of the community. It is recognized by official institutions of the country, connecting the privacy of the Geselle with the standards of the social structure. It is a powerful boundary object, based on the concept of Star and Griesemer (1989)

The learner as an official figure, meets all the regulations demanded by the system. He follows every rule asked by authorities as any other professional in their field does. In this sense Gesellen are entirely recognized in the light of every formality available, something that grants them citizen rights. This is the important reason why guilds came to exist: economy. As Wadauer 2006, (171) explains, “from an economic perspective, this high degree of mobility is connected with the changing demand for skilled labour within the system of small-scale production”. In times of uncertainty, in many societies and economic systems where professionalization systems aren’t answering the deep crisis, these structures may be able to provide some hints in the fashion of the ‘makers movement’, where community, exclusivity and customization acquire a different kind of value.

In such settings, the mere idea of not having a mobile phone could cause many to shiver. However, altering our perspective, we might find that the Geselle has plenty of tools while in Wanderjahre. The road is already one of such, designed and constructed to match human intentions. But so are his shoes, protecting his naked feet from harm. This stance makes the Geselle a political agent. He travels with those items he is able to carry, in action, on the go. This is a statement about ‘de-growth’, ‘the ‘return to the ancient inward happiness’, the return to the ‘basis of all things’, the ‘way back’ that leads to the ‘familiar home’” (Bollnow 2011, 114).

A system with this view, instead of explaining human evolution in terms of *technology*, *language* and *intelligence*, is eager to explain it as *mind*, *body* and *imagination* (Thomas and Brown 2010, 325), *craftsmanship*, *song* and *imagination*” (Ingold 2000, 407) or even in terms of *cooking* (Wrangham

2010) as the driving force to explain our nature. This interest may have played a role in John Dewey's Laboratory School: whenever children attended the Cooking Lab, one of Dewey's obsessions in his curricular design, the central metaphor for most of science was there to be learned (Seigfried 2001, 246); (Menand 2002, 323).

The wanderer of my story acknowledges occasions where it is necessary to speed up and take the highway. The learner must be careful though, because such roads can take hold of wanderers, "who -unfortunately- cannot find a permanent resting place" (Bollnow 2011, 101). The trick appears to be that on the road, the only sense is development, speed, moving forward. It is silly to think about going back. These features call for immediate excitement, one that can end up convincing us there is nothing out there more than the future this highway is leading us towards. If we accept it, we are forced to become "road users" as Bollnow explains, and in such a setting there is no chance but to follow the rules. They are necessary to assure a fast life on the highway.

This applies exactly in such fashion, when in the 1990s, they used the terms "highways" or "superhighways of information" (Sawhney 1996) to announce telecommunication systems, and the Internet. Similarly, educators are always at risk of building syllabus, lectures, programmes, academic terms and research projects comparable to roads and highways. They ask learners to jump into the superhighway of information where they must hurry, (dead)lines, regulations. Our Geselle is aware of all these alien threats. His, is a journey of contrasts. Soon he shall find another path into the openness of the landscape, where he will be able to reflect.

This constant movement between home -his skills- and the distant, is presented by Bollnow (2011, 116) when he explains the concept of wandering as a "holiday occupation", one that rejuvenates. Strolling a path, the wanderer observes the amount of buttons on his jacket. They remind him of the workdays, while the ones on his coat will stand for each hour of work. In practice he will be at home, dwelling in his skills. Later, reflecting on the path or a pleasant meeting with other Gesellen will heal all sore muscles. It is about the essentials, as he is a minimalist designer. Not much about stocking, instead it is about experiencing trajectories that grow and grant access to new scenarios. His craft and actions will always speak for quality, his value as individual is carried by becoming, ready to integrate into new communities of practice.

Experiencing the outer world, material is meaningful in his work. He is not producing. He shapes material while being himself shaped by communities: transformation and change. He proceeds full of respect for the alien, for the material, with the landscape. Each object has affordances that tell of other ways of dealing with the world, away from standards.

For longer or shorter periods, depending on their kind of work or project, they stay in town. Having

a structure that is in constant flux, there must be common spaces to meet other Gesellen or guilds. The interaction between students in these spaces is ephemeral and unique. It comes and goes. A drink with fun. They play and sing. They trade information and negotiate meanings. Someone who was exposed to a special experience may suggest it to others. All of them focusing on a different material or earthly element, get a chance to share. These neutral and exclusive places can also be understood as 'boundary objects' (Star and Griesemer 1989).

The importance of guilds is that they are communities where activities expand, in the sense of (Engeström 2014), and create a fluid interface between individuals, work, travel, learning and society. It may resemble the academic travel Barnett (2010, 80) speaks about, one that requires readiness to live under uncertainty. The kind of life Barnett identifies with the university is one where we push ourselves "forward into new spaces" (ibid., 80), but this raises a challenging situation as there will be "continuing resistance" (ibid., 80).

The community of practice in "Learning by Wandering" is open, historical and embraces the trajectory preceding any learner into consideration. It is transdisciplinary, interconnected, enhancing altering contexts, where old and young share activities. A bed will be ready in special places, and periods of time change with the nature of each of their projects. Experience is lived in a convivial state with rules.

Coincidentally, Wadauer (2006, 180) raises the observation that a guild system of mobile agents can be seen "by scholars as analogous to higher education, a 'University of Craft' (*Hohe Schule des Handwerks*)". In such sense, my thesis aspires to clear up some space in order to imagine initiatives, to transform the space of learning at the University of Costa Rica. The space of learning that shall be established in the "Escuela Postmedial"<sup>8</sup>, shares much of what Wadauer describes as needed for the construction of a space that takes up the historical lesson of the Wanderjahre:

[...] analyzing the basic principles of variation and hierarchy allows one to gain a better overall sense of individual cases, details and episodes and how they contributed to the structure and maintenance of the tramping system. In this way we can leave behind the opposition of objective models of migration as simple effects of labour markets and subjective descriptions of individual motives and decisions.

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<sup>8</sup> Aware of the existence in the German context of a "*Campus Handwerk*", which is a financed initiative being developed in Bielefeld (Krause 2013) and as well of a tertiary educative system that offers technical programmes in Panama (Centro Superior de Postmedia in Medina Anria 2005, 22), I clarify that my understanding of the term 'postmedia' differs importantly to theirs, as I find it problematic to speak in terms of "formal", "informal" or "technical" education. I suggest this name inspired in Peter Weibel's Post-Media Condition (Weibel 2006). To my mind, the word 'postmedial' is a 'boundary object', as it enhances integration of different practices, languages and humans.

Perceptions, interpretations, ambitions, and strategies can all be understood as constitutive parts (Wadauer 2006, 184).

Thinking of *higher education* and *digital media* in terms of *Wanderjahre* and *guilds* can also serve to bring into discussion key elements concerning the space of learning at universities. It is fundamental to remember however, that *education* and *digital media* are distinct fields of knowledge, where each focuses attention on a given description of the world. Human beings commit to one or the other, in hope of being assisted by them in the middle of their everyday practices. These fields, e.g. engineering, mathematics, carpentry and medical sciences are merely structures that offer us different perspectives to deal with our world.

While many of these perspectives are exciting and bring important lessons in clarifying aspects of life, to concentrate exclusively on practices within them endangers its becoming a trivial exercise, fragmented and isolated. Such effort may become interesting again, as soon as we realize that these specificities belong to bigger, shared instances. In the wider background, a more intricate social constellation contains them for their interrelated condition in persistent change. But being interested about any extended approach to explore phenomena often brings a known reply. Bannon and Bødker (1989, 4) indicate that “this call for a richer understanding of human cognitive functioning from others in the community has been to claim that we can’t study everything at once, that we have to decompose problems, and simplify situations so that the power of our experimental methods can be brought to bear on these issues.”

Just as the authors continue explaining I agree that such positions -favouring the old tradition of parcelling out aspects of given 'problems' in order to explore them- respond more to an attitude of “divide and conquer” (ibid.,4) which enhances greatly the creation of knowledge as a sort of competition in selfishness and ignorance, a known issue described in the works of Snow (2013), Kuhn and Hacking (2012) and Gibbons et al. (1994).

From a more official position, the same concern is hinted by Meek, Teichler, and Kearney (2009), who demonstrate the existence of a ruling trend that favours the production of knowledge in higher education as the result of certain disciplines in their combination with institutional policies towards “innovation” -a rather politicized term-, in detriment of other university initiatives. Ahola and Hoffman (2012, 112) talk about uncertainty at universities based on a market-orientated strategy, a sort of academic capitalism (Dias 2008, 138). They tackle the topic in the sense of private universities in Latin America, warning us about conceiving education as a trading object, a commodity to buy or sell, so it turns into customized private property used exclusively to aim for the “best” job offers and higher

profit.

In the light of the previous issues, university teaching becomes an interesting middle point: a medium that extends itself over all these various parts.

In this research I propose to address a research topic while positioning oneself in a realm of mediation, thus avoiding the traditional disciplinary approach. This is interesting insofar as movement becomes the core of such an exercise. While in movement, »perspectives« take place and there is no 'belonging' but instead brokering actions<sup>9</sup> emerge; in addition, there should not be 'hard' nor 'soft' sciences – here offered as example of fixed postulations – but instead we should think in terms of instances and »metaphors« towards the construction of common meadows. In times when “education finds itself under attack from two different directions” (G. Biesta and Säfström 2011, 540), a way between populism and idealism is certainly needed.

Given that “the essence of a metaphor is understanding and experiencing one kind of thing in terms of another” (Lakoff & Johnson 2003, 5), it is conceivable to think that whatever we understand as 'reality' is something »dialectic« and not of an isolated or 'true' value. It is only through metaphors that we can explain anything of an experiential kind, and that is precisely the scenario I am striving for. In it lies the opportunity for units to come together as freely as possible, loaded with metaphors to negotiate and jointly approach all those inquiries that emerge naturally in each of our shared contexts. Under these approaches we might have a chance to access a wider view of a given problem, hence aim for the whole instead of any exhausted, fragmented knowledge.

When I speak of 'reality' as something of a dialectical kind, I mean to stress once again the condition of movement as we learn, understand, communicate or even create knowledge. Explained by Dahlbom and Mathiassen, “the dialectical approach is based on the idea that the world is always changing, and that we cannot understand it unless we understand what change is and why it occurs. The claim of the dialectical approach is that we must think in terms of contradictions in order to understand, explain, and control change” (Dahlbom and Mathiassen 1993, 59). One of the understandings of the essence of metaphors, I maintain, is to be found through the dialectic approach. In both cases, reality is only perceivable in terms of moving relations and is built out of different nodes of individual experience. »Perspectives«, the third term already introduced in this thesis title, comes closely related to metaphors and dialectics: I define it as a collection of metaphors:

A perspective is a way of ordering the world, a highlighting of certain differences into fundamental distinctions. It is a conceptual framework of basic categories, a

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<sup>9</sup> *Brokering* is a term explained by Etienne Wenger in his book “Communities of Practice: Learning, Meaning, and Identity”, published in 1998. It is further discussed in section 2.2.2

taxonomy enabling us to group and classify phenomena in the world, ordering them according to their relative value and importance. It is a few fundamental beliefs about what is and what is not, about what is important and what is not (Dahlbom and Mathiassen 1993, 251).

All in all, metaphors and perspectives appear throughout this whole document. They are sorted in different ways; sometimes they appear briefly to create certain accents in a passage; some others are more extensive and are elevated to become case studies at the end of each sub-chapter.

Ours is a world of metaphors, where one can “enable conceptual osmosis between every-day and scientific discourses, letting our primary intuition shape scientific ideas and formal conceptions feed back into intuition”, and just as Anna Sfard (1998, 4) continues in her reflection, I believe there we have good prospects “by concentrating on the basic metaphors rather than on particular theories of learning.”

By presenting the “Learning by Wandering” metaphor, I discuss certain key debates on space that have been going on for years. The challenge to access a new level of attention isn’t that complicated however, because there seems to be a trigger that makes it unavoidable for us to notice the growing gap between learning and teaching. Digital media achieves this, as it “negates the need for wandering because everything becomes instant. By negating wandering, it also negates dwelling” (Wolford 2008).

That being so, I invite you to read the following, keeping in mind that my conviction is that education happens in metaphors, engaging in action and doing, and in reflecting about how our reflection is largely organized. *Learning by Wandering*.



## CHAPTER 3: THEORETICAL FOUNDATIONS / LAND OF 1000 IVORY TOWERS

...mathematics -and indeed science in general- is not intended to describe reality but to provide a system for us to organize experience.  
(Glaserfeld 2013, 186)

In early May 1959, the famous physicist and novelist Charles Percy Snow (1905-1980) was invited to the University of Cambridge, one of the oldest universities in the world. Following an annual tradition that has been running since 1859 (held regularly since 1706), a public Rede Lecture was about to take place. His intention was to contrast what was obvious for him as he himself was an outgrowth of both groups: the noticeable western intellectual's gap between the humanities and natural sciences.

His argument was remarkably critical of both sides, slightly harsher towards one of them. Talking about his contemporary top-of-their-class scientists, discovering their ignorance on literature and general culture in connection with their interests, Snow asserts "*they are, of course, dead wrong. As a result, their imaginative understanding is less than it could be. They are self-impooverished*" (Snow 2013, 15).

On the other hand, the "non-scientists" were scrutinized even more fiercely, absolutely unaware of the "*edifice*" of science, where "*the majority of the cleverest people in the western world have about as much insight into it (the great edifice of modern physics) as their Neolithic ancestors would have had*" (Snow 2013, 16). Whether his claim was right or not, Snow's critique raised an ongoing debate that apparently had been going on for a long time, since earlier prominent writers and scientists had made public claims about this topic.

Thomas Henry Huxley in 1880 in his University of Birmingham lecture, "*Science and Culture*", and intellectual Matthew Arnold's lecture in 1882, "*Literature and Science*", both at the University of Cambridge, offered a warning about our society's condition decades before.

As Baroness O'Neill of Bengarve said in 2010, the topic "still resonates pretty strongly" (O'Neill 2010). Although it was clear that the Snow critique was bluntly bitter about those non-scientists (humanists), in his final remarks he offers a clear hint to them. "*There is only one way out of all this: it is, of course, by rethinking our education [...] Nearly everyone will agree that our school education is too specialized. But nearly everyone feels that it is outside the will of man to alter it*" (Snow 2013, 19).

Another perspective that captures the essence of Snow's *Two Cultures* is offered by Precht. (ZAK 2013). His exercise endeavors to explain a historical divorce that leads us to examples occurring from 1754 to 1784, a 30-year span that is of special relevance to the process of division between both approaches. A first sequence involves Immanuel Kant and his theory and explanation of the cosmos, leaving aside measuring devices and mathematical calculations. His work "Universal Natural History and Theory of Heaven" [Allgemeine Naturgeschichte und Theorie des Himmels] was nevertheless not taken in consideration the way it should have been, maybe because of its novelty. It aimed to change the traditional approach to cosmology, explaining it without experiments or measurements.

Further considerations appeared according to the model developed by Pierre-Simon Laplace, a scientist and contemporary of Kant. In 1796 he introduced the same concept. Known as the Nebular Hypothesis, it paralleled the Natural Sciences paradigm and thus did not take risks with the unorthodox and novel claim that Kant presented from the philosophical realm. This was acceptable in most European countries, but not in Germany, where philosophical reflection was valued as equal if not more important than the natural sciences.

A second example, depicted by Precht, occurred in 1784 when Johann Wolfgang von Goethe, a lawyer and Minister of Finance in Weimar, who was interested in multiple fields such as medicine, proudly discovered both a new theory of colour that defied Newton's position and the Intermaxillary bone, which was soon to be the key to explaining human evolution.

However, four years before him Vicq d'Azyr, a French physician, had already written about the same key bone and history portrays him as the study's discoverer. According to Precht, between 1754 and 1784, when both stories take place is when Snow's *Two Cultures* finds its dawn; from then on, natural sciences and humanities split from each other.

At Enlightenment's epilogue, the natural sciences were based solely on the mechanistic belief. From then on, non-scientists such as Kant or Goethe weren't likely to contribute as easily to the popular field of natural sciences. Both humanism and the natural sciences were shaped separately into "Ivory Towers", two distinct edifices where human knowledge occurs out of different ways of grasping our world, soon to fragment into more.

Thinking of this historical crossroads, two cultures divided scientists and non-scientists, natural sciences and humanism. »Mechanists« and »romantics«. Dahlbom and Mathiassen (1993) present a broader more appropriate argument to frame our forthcoming discussion: in a general sense we can conceive both as »bureaucratic« and »organic« structures.

Bureaucratic and organic structures have rich historical background. Tracing other western theoretical developments, we may find cornerstone ideas in the inspiring society of Greece. In their

model of philosophical becoming, a dualistic legacy grew between the lessons taught by Plato and Aristotle.

Then concepts related to bureaucracy and organic natures were constructed. According to Dahlbom and Mathiassen (1993, 36), the Aristotelian line of thought was conceived in terms of clear distinctions in order to confront the world's phenomena using absolute instances, sharp concepts and categories. Aristotle led us to think in terms of theoretical knowledge that allowed us eventually to "*recognize the powerful idea of formalization in the mechanistic struggle to arrive at clear and exact ideas. But the mechanists wanted to formalize not only the ideas of symbols we use to represent the world, but also the process of thinking itself*" (Dahlbom & Mathiassen 1993, 10). This could have easily been the driving force that escorted humanity into modernity and there, new physics were established. This powerful setup proved that we were often naïve, thinking of a world through inaccurate perception. Natural sciences disclosed a hidden world on the shoulders of methods and factual theories.

In the meantime, the romantic view inspired us to favour subjectivity expressed through "*ideas about interpretation, uniqueness, chaos, and change*" (ibid., 8) over practical knowledge. Plato referred more to a world of shapes and shadows, a blurry scenario where phenomena were perceived ambivalently, something between instance and concept (ibid., 36). The romantic approach came forth interested in "*daringly courting the monster*", in contrast to the mechanistic approach that "*wanted to see only the surface*" (ibid.,40).

In this fashion René Descartes (1596-1650), a French philosopher and mathematician, originated an idealistic theory to explain the human being in terms of a 'mind and body' dual relation. Also interested in mathematics, he delved into explaining our thinking -a mental substance- as something that performed a "*rational manipulation of symbols by means of rules*" (ibid.,7), a principle that years later was applied comparing early computers to our brains; machines able to think as a result of an inner cerebrum.

This strong metaphor of the human body as dual machine was complemented by Gottfried Leibniz (1646-1716) who not only accepted Cartesian thinking, but also collaborated towards a tuned society better able better understand each other through his universal calculus. Dahlbom and Mathiassen described Leibniz' vision with hope "*that such a language, used both locally and in international diplomacy, would put an end to conflicts of all kinds, based as they were on misunderstanding due to the use of inexact, informal language. Indeed, this was a powerful dream in the seventeenth century, in a Europe ravaged by wars and religious conflicts*" (Dahlbom and Mathiassen 1993, 8).

Struggles are found between romantics and mechanists, yet the latter controls the prevailing layer that organizes most of our social extensions. Rational thinking emerges as a fundamental element to

uphold the public order created by a bureaucratic structure which puts confidence in “*the conscious, competent administration of ideas, aided by a method. To rationalize is to rely on rules, to develop methods, write up programs. To be truly rational, we need not only to follow rules but also to know and be able to state and defend the rules we are following in our thinking*” (Dahlbom and Mathiassen 1993, 16).

Of course, it would be highly naive to speak of our society in terms of two ruling approaches; it would be equally mistaken to talk about ‘good’ or ‘wrong’. Embedded among us are mechanistic and romantic ideals that interweave in deep negotiation and analysis. These principles give us a sense of order the way things happen when we follow a colorful agenda during a week packed with meetings; we do this always in hope of a joyful get-together, going out dancing, laughing side by side with friends.

*What is the difference then? Why is it that bureaucratic structures seem to be more fashionable?* One may keep wondering, but in the meantime bills aren’t getting paid by dancing with friends nor are we closer to the certainty granted by order and prediction. Deadlines must still be met and work done; to be part of our society means that humans need to cope with the protocol requested by the bureaucratic structure. To the extent that rules are not obeyed, our organizational design trembles. A clear and concrete perspective of hierarchical dimension leaves little space to question given order. It is just the way it works.

The beauty of our social constellation, one might say, surfaces by virtue of the tension between two cultures. But to begin our journey, another feature must be stressed while thinking of our last metaphor: the structured busy week with plans to go out dancing with friends. We could go on explaining the differences: how both structures and mindsets can be approached and how our behaviours are shaped in situated setups. Nonetheless, it is my plea to look beyond and notice contrast, and in the light of that, decide and comprehend. Equally important, if not mandatory, is to study the “moving in-between”. It is on the move that we come to be a whole, not while thinking, fragmented, passively standing in one *ivory tower* watching the other from a distance.

We think of the computer as the mechanistic masterpiece, a fine artifact that comprises a vast range of possibilities that are each of them, as McLuhan (1994, 90) insists with all technologies, “*extensions of our physical and nervous systems to increase power and speed*”. If so, the original question may broaden. Instead of trying to predict, for instance, how to effectively introduce information and communication technologies (ICT) in our classrooms, it might be more interesting to understand the nature of human learning, where it happens and what existing conditions there are to be matched with computing machines. Instead of time and effectiveness, we may talk about

'experienced space' and negotiated emergence.

The machine is a fascinating device *of* and *for* metaphors; at the same time "*it is a perfect bureaucrat, and it invites us to think like bureaucrats. We cannot use it without formalizing*" (Dahlbom and Mathiassen 1993, 16). In it, a dual legacy comparable with that between Plato and Aristotle, romantics and mechanists (non-scientists and scientists) in each of their towers, is that knowledge takes place. Today, as a teacher lectures in front of the classroom, students are forced to meet the bureaucrat-dictating humanistic lessons. A curious event crops up: they sneak into their metaphor devices, longing for what is distant, glancing at instances closer to actual life, where learning finds its natural space. For the strict bureaucratic agent this is a disturbance to extirpate, for an optimist, it is an opportunity to take up and profit from, part of didactic strategies. All the same, their reactions will stick to a curricular design, a syllabus or a class plan, pieces of control necessary for bureaucratic thinking.

### 3.1. TIMES OF DIGITAL MEDIA / UNFINISH BUSINESS

Shortly before the new millennium, Peter Lunenfeld (1999, 7) wrote provocatively on the naïve idea of finishing a job. In his argument, he meant that "*the business of the computer is always unfinished. In fact, "unfinished" defines the aesthetic of digital media*". Certainly, an assertion of this kind calls for conjectures, questions even; but to really understand Lunenfeld's presumption avoiding the obvious connection with the computer wonder, we remember influential Marcel Duchamp in his remark about the creative act. In times before the advent of the personal computer he expressed:

"All in all, the creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act" (Duchamp 2015).

Before pervasive computers, this declaration forces us to step back and reconsider our first impression, as in Duchamp's times, society was triggered by the aesthetics of the *unfinished* already. On the one hand, we could conclude that the advent and success of the computer artifact indicates the beginning of a dramatic social change that will take us dangerously into the limited realm of mechanism.

On the other hand, it is more enlightening to explore the meadows in between our *ivory towers*, where different perspectives are to be found. In constant movement we experience contrast and

because of that, we come to perceive, understand and create a different kind of knowledge, closer to the whole instead of fragmented 're-presentations' of our world; this was part of the lesson in radical constructivism<sup>10</sup>.

With Duchamp, we can imagine an epoch where humans plunged, agreeing on active interaction and continuous construction, hungry as they were for something beyond the obvious and static. Those interested were close to the *romantics*, who pursued a world beyond the information collected by our senses; for they avoided the figurative deceit. In the twentieth century they dreamt of reaching further with extensions of mind, movement and secrets to be deciphered.

Now the *unfinished* aesthetic appears, owing to the fact that Duchamp's creative act was attainable exclusively through formalizations. This is the reason why Duchamp forced the spectator inside the creative formula. He thought of a procedure standing for what was previously achievable by plainly staring and thinking of the passive object. Now, an in-between activity connected the surface with extensions of a changing nature. With it, understanding became an *unfinished* process in need of mapping changes in pursuit of immediacy. This is the same situation Lunenfeld speaks about, an insinuation to decipher.

Consequently, there is a great challenge whenever our position is *against* or *on the side of* computers, digital media, ICTs or technology. It could be comparable to missing the point when Lunenfeld speaks of the "*unfinished*" aesthetic in digital media. His message is only an indication of a larger metaphor that is portrayed also on the surface of the computer artifact. The sign constructed with computers assistance is partially perceived if we remain benumbed spectators; beyond lies an intricate sign with important implications in relation to the rules to be followed in benefit of the bureaucratic structure. This dimension is identifiable by those aware of how the illusion is being created. In 1962, maybe trying to favour non-scientists, C.P. Snow's critiques significantly touched scientists:

Gadgets are the greatest single source of misjudgment that I have ever seen, or that anyone has ever seen in scientific decisions in our time. People get fascinated by gadgets. They love them. They want everything to be explained in terms of their gadget. They think it is the answer to everything on heaven and earth. All the bad decisions I have seen have some element of gadgetry in them. And I suspect that computers in government are going to get into the hands of persons with mildly defective or canalized judgment and become gadgets. It will be astonishing if that does not happen (Snow 1962, 12).

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<sup>10</sup> To be discuss in section 1.1.

We find ourselves in the crucial moment when the flickering screen stands opaque, preventing most of us from seeing the growing number of operations happening simultaneously within the artifact. A mechanist perspective in the Human Computer Interaction (HCI) field would explain that it is a “gesture” to make its use easy for non-technicals, and they offer “user-friendly” designs with which to interact (Stevens 1983). Furthermore, it is naive to think that the beauty of the machine matches Duchamp’s formula, where the creative act is filled with interpretations and deciphering processes out of the spectator; this applied then.

In our day, most of the encrypted meanings in the machine are far from our reach, a kind of literacy that is not necessary to have when we linger with the traditional concept of interaction. What it does is describe our relation to different sorts of software being pushed onto a surface by the machine; this only means we aren’t aware of the encrypted world within the machine, as it is unnecessary. Seen this way, an important dimension remains hidden from us and the gap grows larger between humans in their relation to computing machines.

Revolutions take place without our noticing, said Peter Weibel in 2004, as an introduction to an exhibition entitled “The Algorithmic Revolution, the History of Interactive Art”. He announced that “»the Algorithmic Revolution« lies behind us and nobody noticed it. That has made it all the more effective – there is no longer any area of social life that has not been touched by algorithms” (Weibel 2015, 1). Moreover, in 2009 UNESCO defines it as the “Knowledge Society” and “Knowledge Economy” after the 1990’s Third Industrial Revolution (Meek, Teichler, and Kearney 2009, 13).

Lunenfeld wrote about the *unfinish* work in reference to digital media, Duchamp read out loud to explain the creative act being performed by artists and spectators. The metaphor did not belong to fragmented disciplines, but to the spirit of an era and the changing nature of meanings. A third instance could help us further. “To put it cryptically, being a university is always unfinish business. Being is always active. Being a university, therefore, is not a passive existence” (Barnett 2010, 62).

### 3.1.1. The artifacts of media

In *Understanding Media*, Marshall McLuhan discusses processes in our society where humans support their way with technology. He presents a collection of historical lessons and after them, different media were associated. He offers a powerful message that influenced some sectors, despite critics like Finkelstein (1968), who accuses his book of being driven by his personal and skewed perspective.

To a certain extent, some of the accusations against McLuhan’s work in 1963 are right, it is as clear that his style does not seem to aim for rigorous academic realms; it is an unorthodox way of writing

that finds strength in the arms of historical examples and clear statements. What he does successfully is to bring on certain relevant core concepts, such as his definition of media and media categorization.

Relevant to my debate, McLuhan defines »media« as “*extensions of man*”. However, it is important to pinpoint that his notion of media emerged intimately related with the corporeal realm of human beings. He talks about our “*physical and nervous systems*” and next to this, he states “*increased power and speed*” (McLuhan 1994, 90) as the ultimate goal pursued by such extensions.<sup>11</sup> For this claim, I find it interesting to offer a complementary idea underscored by Hall (1966, 178):

“However, when an organ or process becomes extended, evolution speeds up at such a rate that it is possible for the extension to take over. This is what we see in our cities and in automation. This is what Norbert Wiener was talking about when he foresaw dangers in the computer, a specialized extension of part of man’s brain. Because extensions are numb (and often dumb, as well), it is necessary to build feedback (research) into them so that we can know what is happening, particularly in regard to extensions that mold or substitute for the natural environment”.

In Hall <sup>12</sup> we encounter some concerns being raised precisely around the concept ‘speed’, which acquires other connotations in terms of “dangers”. Facing this condition, *research* is emphasized as a key component to obtain awareness of the relation we have with media as *extensions* of human beings. This stance is probably shared by Jay David Bolter and Richard Grusin, who conducted in 1994 a revision of key concepts on ‘remediation’. Already in the introductory chapter, they offer their understanding of »medium«:

...a medium is that which remediates. It is that which appropriates the techniques, forms, and social significance of other media and attempts to rival or refashion them in the name of the real (J. David Bolter and Grusin 2000, 65).

For them, as it was for McLuhan, a medium exists always in necessary connection to a previous one; therefore, their interest underscores the process of »remediation«. To explain the term, they

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<sup>11</sup>–In this explanation offered by McLuhan, a clear association is underlined between digital ‘media’ and ‘speed’, a fundamental dual relation to pay attention when later on, I explain the relation between higher ‘education’ and experiential ‘space’. If this was the case, the nature in media appears to be in deep conflict with the perspective of education, specially if we comprehend it after the *Bildung* concept.

<sup>12</sup>Interesting enough, it was Hall who in the same text coined his proxemic theory (further mentioned in section 2.2.1 in this thesis), that studied the meaning of space as “*people’s use of their sensory apparatus in different emotional states during different activities, in different relationships, and in different settings and context*” (E. T. Hall 1966, 171)



remind us of its Latin origin “*remederi* -to heal, to restore health” (J. David Bolter and Grusin 2000, 59) and with it, a straightforward intention is drawn to create a link with a meaning accepted by society for ages.

As shown, *remediation* denotes a vision of reformation and improvement of something, this remains the leitmotiv along their arguments. For them, each new medium is erected on top of an earlier medium. “*Each new medium is justified because it fills a lack or repairs a fault in its predecessors, because it fulfills the unkept promise of an older medium. (Typically, of course, users did not realize that the older medium had failed in its promise until the new one appeared)*” (ibid., 60).

In addition, a relevant clarification between both terms -*media* and *medium*- must be stated due to multiple meanings available in literature. This multiplicity could potentially mislead debates about the two.

A *medium*, in the conceptualization offered by the previous authors, matches fairly the first description stated in the Oxford Dictionary (2013) namely, “the word *media* comes from the Latin plural of *medium*. The traditional view is that it should therefore be treated as a plural noun in all its senses in English”. Moreover, a second understanding of *media* in relation to the field anatomy<sup>13</sup> is indicated, in terms of an “intermediate layer in the blood or lymphatic vessels”. This claim is related to the “late 19th, *media* being a shortening of the modern Latin *tunica* (or *membrana*) *media* ‘middle sheath (or layer)’”.

For this thesis, the understanding of *media* is closer to this second description. Consequently, in this document, to speak of a *medium* is to think of an »instrument«. Mediums, instruments and human beings are immersed in »media«, a term that here should be understood as the layer that mediates the world between phenomena and actants. In it, an active system of objects and processes takes place and out of them, data is collected with our senses, sometimes as well through instruments (mediums) of various kinds.

It is of further help exactly as we did with the *instrument* concept, to analogize mediums with »artifacts«. Ultimately, their function is to mediate between actants and objects or events outside, as part of a perceivable world where *media* expand. We apply different instruments immersed in *media*, thus accessing a rich environment full of data. The result is that after being collected, this data is interpreted in various ways and even by computers. We all profit from it, despite our contrasting natures.

This scenario becomes more complex when we reflect on the possibilities we have at hand when using instruments; they influence the world we grasp as for the transformations we perform by acting

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13 The branch of science that focus on bodily structures of humans, animals and living organisms (Dictionary)

back. These mediums are *extensions of men*, sure, but they are neither equal nor neutral. Their characteristics determine experiences full of contrasts and for that reason it is very valuable to be aware of the kind of reality we are shaping whenever we use an artifact. It is not the same world we perceive while using a candle, a street light or a light-responsive control system.

Previously I discussed different categories of instruments. Based on Nake (2012), we identify three of them, (a) »tools«, (b) »machines« and (c) »automatons«. Roughly, they differ from each other in terms of their relation and dependence to humans.

In the first type, the bond between humans and *tools* is highly intimate; in it humans perform the largest part of the process and must get actively involve as physical beings, in the meantime *tools* assist us to maximize achievement. A circus announcer in front of a crowd uses a megaphone to project and amplify his voice.

On a second level, *machines* to some extent need the influence of men, however the amount of physical energy invested by the individual while performing, demands less commitment in comparison to when a *tool* is being used. The *machine* is a medium made of different parts, where each follows orchestrated protocols and performs in physical contexts using mechanical power; their physical actions substitute the earlier effort carried out by humans to reduce strenuous activity. A teenager listens to a transmission at home that is originally being broadcast 100 miles away by someone she doesn't know; for that she uses a medium called radio. It works only after she places four big energy units (batteries) that she bought around the corner. Her favorite song is being played and she quickly reaches for an external recording unit (cassette) lying under her bed. She inserts it into a special compartment of the radio and pushes an orange button.

In the third variety, *automatons* are instruments in less need of human presence to achieve their functions, in fact, they tend to disappear completely from our sight to let us concentrate on a 'surface'. *Automata* execute a series of instructions that are precisely followed to accomplish tasks, and depending on the complexity of such programmatic commands, they can perform automatically.

A person drinks coffee away from his work station, where a personal computer is turned off. As he looks away, a cat walks on top of the computer and presses the power button. Not a human, but the family pet initiates an internal process of the highest level that makes that passive object change its state, since "*working as a machine, it is executing a program. It is doing this under the control of an operating system. The operating system is itself a program. The program, that the computer is executing, takes data and transforms it into new data*" (Nake 2012, 82). And maybe if the human continues enjoying his beverage careless of this automaton, a formal procedure will be followed inside the artifact in order to execute more rules. Without the human, and the cat even, the computer will

now “sleep”.

After considering these cases, we infer that *remediation processes* work not only in terms of improving technical characteristics along technologies, but also by “*healing*” what according to *mechanist* criteria is delaying the optimal state of such artifacts. They assimilate and reinterpret characteristics that are not exclusively technical, but as seen, processes from which these mediums are constructed upon. Human beings and their social constructions are implicitly included.

To understand this idea better, we recall the telegraph, the main purpose of which was to remediate an old tool, the letter. As is normally the case among early examples of technologies, we can identify the immediate relation to our physical condition. Concerning a *mechanist* approach, our bodily capabilities do not contribute to the optimization of tasks being carried out in comparison with improved instruments:

“Prior to the telegraph, all messages, including those expressed in writing, could move only as fast as a human being could carry one. The telegraph eliminated in one stroke both time and space as dimensions of human communication, and therefore disembodied information to an extent that far surpassed both the written and printed word” (Postman 2011, 70).

After a chain of *remediations*, it may result awkward to think of email software as an “updated version” of an older, analog sequence which involved human bodies delivering physical letters, which in a way is what happened. We can certainly understand why the new mobile application tool in our smartphones is better than the old desktop-computer version, but the image wouldn’t be really complete without uncovering the missing links of this trajectory of artifacts being *repaired*.

The reason for the absence of these associations is that once hindering conditions become healthy circumstances, such hints are removed from our attention to allow us to better concentrate on specificities towards the acceleration of the *bureaucratic* process, largely concerned with quantity, data and control. The interpretation here is that the human mechanism is not as reliable nor efficient, different from the machine that offers better conditions to meet certain results. The artifact is assembled to fulfill predictions; human hardware is not as predictable.

In the telegraph example, we can also easily identify two important concepts that are valued in artifacts as they appear: *standardization* and *efficiency*. Both are achievable only after the formalization of processes that are characteristics of a *mechanist* nature. With the telegraph, not only the letter medium was remediated, but also the conditions surrounding its social function.

To further understand artifacts, Dahlbom and Mathiassen (1993, 140) open new lines of debate

stressing the difference between instruments as »manufactured objects« and »natural phenomena«. Different from the latter, *manufactured objects* are created by men to accomplish purposes, and since they have known trajectories these objects are to be analyzed on whether or not their qualities meet the purpose originally drawn for them. Nevertheless, qualities and measurements of these kinds are also applicable to *natural phenomena*, such as our learning processes, which as soon as they are assessed for qualities and purposes, become *manufactured objects*. In these terms, there are three standards to apply to artifacts:

When we evaluate artifacts, the basic question is always the same: "Is it good?" But different types of artifacts are evaluated by different standards. Technical artifacts, artifacts for everyday use in, or outside, working life are, in principle, evaluated by three different standards: functionality, aesthetics, and symbolism. With functional standards, we evaluate the practical use of an artifact; aesthetics is a matter of how it looks; and symbolism has to do with its social use, what it means to us and signals to others (Dahlbom and Mathiassen 1993, 147).

Understanding artifacts this way, makes clear to us the reason for evaluation, usability tests and argumentations on the quality of an instrument, every time new technology hits the market. These mediums appear in society with declared purposes, and they should meet the drawn qualities in order to be successful and functional. However, we see that this tradition does not apply simply to *manufactured objects*, but extends further to the *organic* structures of *natural phenomena*.

Within learning spaces at higher education for instance, we evaluate all the time and standards that exist everywhere, normally dictated by international institutions of serious work. Does it mean we twist education into a *technical artifact*? What do we mean when we talk of functionality of higher education? When incorporating a technology into our classrooms, do we do it because of a symbolic value, becoming empathetic with students, or because of functionality?

Often as I walk around the Medical Faculty at the Universidad de Costa Rica, I meet people dressed with white lab coats discussing their evening class and the course evaluation to come. Looking so different from the rest of the non-uniformed students on campus makes one wonder; is this laboratory garment still functional outside the lab or, differently, does it have a symbolic value?

These become relevant debates to clarify our research question, and in Diana Laurillard's arguments on the educational realm, we encounter digital media as the meeting point. For her, the relation and the conditions to be met at our institutions are clearly *manufactured objects* instead of *natural phenomena*. She states the following:

“No matter how democratic we are about respecting the student’s point of view, there is always a pre-defined standard of answer. That is why our model of education at undergraduate level is more often didactic than negotiated, teaching methods are many-one rather than one-one, and we control rather than offer resources. And that is why as teachers we have the major responsibility for what and how our students learn” (Laurillard 1993, 2).

In her ideas, I want to draw attention to certain relations that are bound to the *remediation* processes of instruments. As she debates teaching methods, she conceives two models of education that remind me of our previous analysis of tools, machines and automatons. When she says a method “*many-one*” is different to a “*one-one*”, this can be interpreted as education happening either as “many fitting one” or “one in close contact to another one”. Similarly, we can express this about instruments. The *tool* is intimately related to the human, both physical bodies are close, while in the *automaton* they are distant, enough to let a cat do the human’s work and to initiate many processes to fit one program.

“One-one” is the formula for the *analog*, “many-one” is the ‘computable’, the »digital«. This basic concept is “*one of the most widely misunderstood concepts*” of our times, according to Neil Gershenfeld (Edge 2015). In his view, the confusion takes place whenever we fix our attention on the shape of formal processes to artificially describe natural phenomena. This shape comes as digital or physical.

The fact that his motivation in the topic is connected to identifying the boundary between both suggests the importance of conceiving them as a pair. This idea is strongly stressed by Nake (2015), as he acknowledges them as a dual relation, always between calculating and drawing, our two basic capabilities as human beings.

More precisely, Nake recognizes calculating (or *reckoning*) as the digital, while drawing stands for the analog: the discrete, the continuous. Already in the cave, at the beginning of our culture, humans used digital approaches as they fabricated marks on the walls where they counted; in addition, they followed rituals and they drew. The digital and the analog are not different, they belong together.

As it is with instruments, education takes place between the effective and standardized, or the not-so-certain but unique. This reflection serves well in considering the kind of place we are constructing at universities for instance, as soon as artifacts are brought into the educational design, computers among them. Are they functional for students throughout their learning events? Or differently, are they counterproductive to the educational project? Why would this be? This analysis is of paramount relevance to teachers, since with their actions they might be fostering “the symbolic and static qualities

of an artifact" (Dahlbom and Mathiassen 1993, 149), something that may interfere with functional qualities of their teaching designs.

### 3.1.2. Imitating immediacy

The *mechanist* belief about instruments does not dictate the way mediums are to be approached. Following a formal and structured perspective to explain the world, within this framework important and exciting developments have been described. But we have to be aware that instruments of the *tool* kind were with us before history. Yet is to be emphasized that our idea of humans and tools shape each other in various ways, and with it, their environment.

Bolter and Grusin (2000) offer an illustrative example of when the line between science and art blurred, remembering Nicéphore Niépce writings when he discovered a technique to obtain images, "*the Daguerreotype is not merely an instrument which serves to draw Nature; on the contrary it is a chemical and physical process which gives her the power to reproduce herself*" (ibid., 27).

This technique was a procedure to capture pictures with one-exposition per session, where a chemically curated layer of copper was taken in front of a reflected image to get it printed directly on the material. In Niépce's quote, the instrument Daguerreotype is described by his creator as of a kind that allows *Nature* to reproduce herself thanks to the mechanical carriage.

In this scenario humans are out of the scene: the fundamental description appears in relation to the concepts of "nearness" and "intimacy". The tool Daguerreotype is »analog«, because it allows one to reproduce itself in another one. Yet, this is not enough in the mechanist approach. Later, the captive principle in the reproductive action was taken up by photography and optimized into many-one. The Daguerreotype in its one-one method was healed by photography with a many-one method, but as the artifact was changed, so was society.

Explained by Lovejoy (2004), this event brought disturbance to the artistic scene, where the concept of something unique, of the »original« object was severely challenged:

"The copying processes of photography undermined the aura of the original and its value in the marketplace. Thus it threatened the existing foundations of the art establishment which were based on the hand skills, implying the genius of the artist. Photographic reproduction and the cinema raised social questions about the artist's role, about the audience for art, about art as communication rather than art as object, and thus brought into focus the social function of art" (Lovejoy 2004, 5).

In Lovejoy's idea, we can explore the complexity behind a remediation process. The instrument is not neutral but highly contextual: whenever a change is inflicted on it, it is imposed on the constellation of elements in relation with the instrument, humans being part of it. In her example, the new instrument remediates painting and with it the artist's craft. Behind this evolution, a series of implications affected economy and aesthetics. Most important for this thesis, this progress brought new dimensions to the world of manufactured objects -here understood as 'signs'- and their symbolic statement after representation, perception and interpretation.<sup>14</sup>

In the case of the photographic artifact, its social impact and the following debate may be explained with the effective omission of the human, who was originally related with the tool, and more precise in this context, the importance of the artist as the 'maker' of the original object being pushed away; it was a sort of new development never seen before in the history of human instruments.

In terms of Bolter and Grusin (2000, 25) "*photography was often regarded as going too far in the direction of concealing the artist by eliminating him altogether*". An inviting hint lies in the "*too far*" indication for it is interpreted as the medium that reaches "*too far*" in the direction of eliminating a human. It is the one that gets "nearer", "closer"; and "more precise" to the source-object or experience that originally inspired the creation of this manufactured representation.

In this case, the medium's outcome is a »sign« with known qualities, a unit able to stand for an 'actual experience' or an *original* object according to its specific qualities. What is remarkable about the photographic sign in its quality of nearness to the object it 're-presented'<sup>15</sup>, is that it was good enough to satisfy the quality of »immediacy« expected by us, provided with multiple senses for experience.

The photographic image fulfilled the *immediacy* needed to stand as if the real thing, only by producing a sign the purpose of which was to trick human vision with the old imitation deceit explained by Brunelleschi in early 1400<sup>16</sup>. This originally helped artists to develop a painting medium to be remediated by photography. It was a type of sign that approached one of our sensitive channels and by remediating our visuals, pushed aside the old, imprecise medium known as painting.

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14 The field of study is called »semiotics«

15 'Re-presentation' different to 'representation' is a concept developed by von Glasersfeld and it is further explained in the upcoming section.

16 *After an experiment carried out by Brunelleschi, he developed a graphical method to create flat images closer in representation to the way we saw images with our eyes. Greenberg (2007, 8) explains that "Filippo Brunelleschi (1337-1446) took up painting to apply his newly developed theory of perspective, based upon Greek geometry. Additionally, other major Renaissance painters including Piero della Francesca, Albrecht Dürer, and Leonardo da Vinci not only experimented and applied principles of geometry in their work, but also published treatises on mathematics. Dürer even developed several drawing machines that could be used to teach perspective."*

It is fundamental to be clear about the difference between terms. According to the Oxford Dictionary (2013), *immediacy* is that quality of bringing one into direct and instant involvement with a “something”, in this thesis understood as the »actual experience« or an »immediate« unit. This word finds its origins in late Middle English and stands for what is ‘nearest in space or order’, however it is referred also to Old French *immediat*, or from late Latin *immediatus*, from *in-* ‘not’ + *mediatus* ‘intervening’, past participle of *mediare*, which again, is fundamental because in Latin, *mediates* means ‘placed in the middle’.

To comprehend better, let’s think of the Geselle, learning by wandering, placed in the middle of a *landscape*. There, he has various ways to perceive and ‘accommodate’<sup>17</sup> all data being collected through a body and intellect, hence appropriate to the interpretation of the actual experienced *landscape*. The Geselle is there, in the middle of the scene. He crouches to take a different perspective and analyze what is happening, while being part of it. The learner notices a tiny little plant next to him and with perceivable characteristics that remind him of a special herb back in his village, traditionally in his mom’s kitchen used to prepare a special soup recipe. Just to be sure, he detaches a leave to bring it into his mouth to verify the taste, thus triggering his memory. In front of the Geselle, the wind blows between trees and plants, dragging along soft scents that are known or unknown. Suddenly he feels cold, right after noticing little tiny drops of water running down his forearms. Lighting and thunder shortly after announce that rain is about to take place.

Lakoff and Johnson (2003, 117) offer a definition on *natural kinds of experiences*, the origin of metaphoric thinking. For them, they are the product of “*our bodies (perceptual and motor apparatus, mental capacities, emotional makeup, etc.), our interactions with our physical environment (moving, manipulating objects, eating, etc.) or our interactions with other people within our culture (in terms of social, political, economic, and religious institutions)*”. In such terms, these instances are originated from and for the human, and it is as acknowledged that they will vary from culture to culture. (ibid., 118).

Different is the *medium*. Its purpose is to represent the same landscape in its complexity, a natural phenomenon which is traditionally experienced by each human being simply by being there. For this, a manufactured object will be produced and it will aim to contain the information in the landscape. If this were one of the Renaissance artists using the perspective method, the outcome of the artifact painting should evoke in a viewer the experience of being in the middle of that landscape, while not being there. The painter will make use of certain visual techniques to execute his interpretation, different from

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<sup>17</sup> *Accommodation* is a concept presented in von Glasersfeld’s Radical Constructivism, a term originally coined by Jean Piaget. This is explained in page 119



someone else's experience of that landscape. The artist will be supported by certain standards that if rigorously followed, will trick a human being into believing he is confronting the same landscape, a representation which is close enough to "reality".

It is agreeable that from individual to individual, the visual trickery will accidentally trigger memories of experiences in each person, but this is a personal process of a cognitive kind, strongly bonded to the uncontrolled context in each spectator. What painting and photography do, as for any other medium dealing with copies, is related to »imitation« (Oxford Dictionary 2013), where »imitate« finds its origins in mid-16th cent.: from the Latin *imitat-* 'copied', from the verb *imitari*; related to *imago* 'image'.

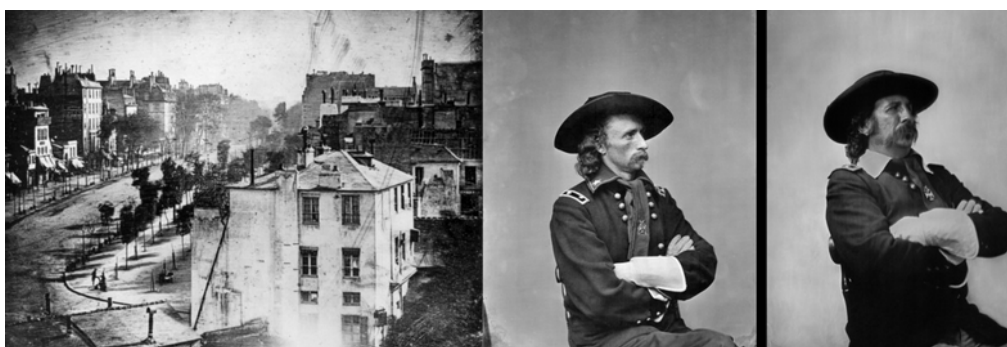


Fig.01. *On the left side*, one of the earliest images captured by Daguerre, in 1838, with his daguerreotype technique. *Centre and right* images are copies of a collodion process. This technique allowed the creation of negatives out of a projection, thus allowing the production of copies of that same image afterwards. The centre image is an 1865 portrait of General Custer and the right image is a reenactment image using the same technique in 2013. (Balkowitsch 2015)

In these pictures, we find an essential principle that is cornerstone for many other remediation processes, in times when Daguerreotype technology was overtaken by the photographic device. In terms of its purpose, the change appeared to be driven not by the aesthetic standard but because of its functionality (Fig.01).

As we study them, the resulting images appear to have similar aesthetic standards; however, their functionalities were different and allowed their *reproducibility* to become the focus of attention. With the daguerreotype, attention was on the *original* work. With the collodion technique, attention was on the many instances of an *original* work. The importance of the uniqueness as a symbolic value was shaken without many noticing, due to a technicality which was impelled by the purpose of imitating visual immediacy. In such terms is *reproducibility* close to »repeatability«, the concept referred by McLuhan to be "*the core of the mechanical principle that has dominated our world, especially since the Gutenberg technology*" (McLuhan 1994, 160). He offered an example:

Printing changed learning and marketing processes alike. The book was the first

teaching machine and also the first mass-produced commodity. In amplifying and extending the written word, typography revealed and greatly extended the structure of writing (McLuhan 1994, 174).

Among possible features, as with the printing machine of Gutenberg, the functionality of *reproduction* dictated an agenda of developments and changes throughout a trajectory of remediated instruments. Men and society came along. In McLuhan's idea of the printed book as the teaching machine, the concept of *repeatability* can be studied as a functional standard present since early stages of technology, and this is surely of relevance for most bureaucratic structures, higher education being one of them.

Hall manifests that mediums emerge as extensions of men with certain standards, and if agreed on assuming an agenda for them to "take over" and support us in our quest for immediacy, we rely on their mechanical characteristics whenever we use them to approach immediacy. As shown, this trade has certain conditions and most of the time, these signs we create with our instruments are reduced in their effort to get closer to immediacy and experience.

The artifact photography relies largely on the visual sign. Like with the automaton in no need of humans to work its processes, the data which is fabricated in the image do not depend largely on the human as a whole body, but first as a technical worker setting up the canvas, and then a visual perceiver with cognitive capabilities: a clear Cartesian approach. Surely imitation and repetition are fundamental, because as we have learned, these qualities belong to the mechanist realm that allows the medium to continue in its evolution to efficiency and certainty.

From here on, we can track a trajectory of remediation instruments intended to support us in perceiving *natural phenomena* but using a determined perspective. Instruments of the visual kind created signs with different qualities, functions, aesthetics and symbolism. But with them, standards emerged to determine how the original should be represented, and with it our understanding of 'immediacy', the actual experience. What happened is that some of these *signs* evolved into more intrinsic shapes and obtained a value of their own, not merely imitation. The imitation became just the hook for a new kind of sign that hides away, just as the automaton does:

Since existing French copyright laws applied only to the arts, photography had first legally to be declared as an art form before it could come under their protection. In a test case in 1862, arguments cleverly turned around the questions: Is the painter any less a painter when he reproduces exactly? Does not the photographer first compose in his mind before transmitting his perceptions via the camera? The court decision

granted full copyright protection to photography as an art form (although engravers were not equally served by this law). These questions about photography as a viable art form obscured the primary question. Photography, both as a tool for mechanical reproduction and as a medium for representation, had challenged the existing tradition for art (Lovejoy 2004, 30).

Lovejoy's recapitulation of photography in its debate against the artistic sector is reported accordingly. It illustrates remarkably the remediated artist, who after an official announcement was standardized by the structure of order. The mastery of the bodily painter is replicated in the mind process of the new photographer.

## 3.2. FRAGMENTED REALITY / TO PERCEIVE IS TO FRAGMENT

We have learned that all mediacy requires immediacy. For this, some arguments were raised to follow certain aspects of remediation process of instruments in given human contexts. Both, artifacts and humankind shape each other in a dialectic relation, not being determined solely by causes but by an interrelated constellation. To grow further into the dialectic relation of humans and their instruments, we are now in need of a theory able to explain human perception, thus understand better how is it that we come to create knowledge as for the role of instruments in this process.

Later, I offer some ideas in relation to our ways to operate experiences in terms of sequenced units, a theory introduced by Ernst von Glasersfeld (1917 - 2010) in his model of Radical Constructivism. In connection to this natural process, I will indicate a correlation with the appearance of early instruments and construction of the concept of time and speed as a result of further remediation processes.

First of all, we need to clarify new key terms for our discussion, thus distinguish differences between the meanings of 'data', 'information' and 'knowledge'. Concurring with von Glasersfeld (1996, 20), "*what we call knowledge is necessarily composed of subjective abstractions from experience and not the representation (faulty or correctible) of an objective reality*". In this sense knowledge can not be a standard object but the result of exclusive processes for each individual.

Information on the other hand, cannot be considered knowledge. Whenever we utter words, write messages or draw landscapes, this is all information. Inspired by our knowledge, human beings create symbols and signs to be able to refer to experiences lived in each individual's life. According to Bolter

and Grusin (2000, 26):

“Information comes in bits and pieces; knowledge and competence do not. Information is explicitly expressed in the form of signs and externally materialized as sound, print on paper, or electronically lit pixels on a screen. In contrast, knowledge and competence are personal and intrinsically related to each individual’s practice. Information is something we provide and receive; knowledge and competence are something we have”.

Finally, »data« is presented in this thesis as “*formalized representation of information, making it possible to process or communicate that information. Information is not the same as data*” (ibid., 26). In other words, data are known symbols and or characters that are comprehended within standardized sets of a known kind in order to construct information.

Presented this way, data are reliable and limited. With it, we can establish controlled and predictable strategies, allowing *cognitive* humans to share a common “language” with *automata* for instance, or even Sumerian kings to promulgate their codes and punishments<sup>18</sup> to citizens limited by ignorance. Data are not abstract but standard. In front of data, a person or an automaton equipped with the right protocol will decipher; yet in such a scenario computers are far more efficient than humans because their purpose is to store and manipulate data to the highest disembodied speed. By doing this, *information* is constructed, this time not as concrete as data but manageable enough to be interpreted through foreseeable methods. Order becomes information vital to construct *knowledge*, which is the active mental process taking place strictly as a result of experiences undergone in human beings. In view of the fact that it is an abstract, highly unpredictable process, automata are not able to construct knowledge:

“Turning knowledge into information and information into data is a difficult task as soon as we aim beyond anything but the most formalized and routinized type of knowledge. Sometimes it is even quite impossible” (Dahlbom and Mathiassen 1993, 33).

Although data may seem strongly bonded to computers and modern machine realms, it is interesting to realize that human beings have had a close connection to it since early times in their

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**18** The code of Hammurabi in 1754 BC is one of the oldest codes deciphered in the world. Using cuneiform marks, -the earliest known system for writing- the king Hammurabi announced to people in Babylon the set of laws by which they were governed. (“Code of Hammurabi” 2015)

relation with instruments. As we review the historical lesson revealed by anthropologists and other fields investing efforts towards our origins, it has been shown that this necessity to fragment experience into data emerged possibly after the natural act of *reckoning*, already present in people during ancient Paleolithic period.

According to the scientific work of Denise Schmandt-Besserat, until the 1950s the common belief pointed at pictographic theory<sup>19</sup> to be the closest mature theory explaining the origins of *data* systems (characters) and with it writing. However, the latest findings in archeology demonstrate that it is *reckoning* a verifiable antecedent of writing, and ultimately what came out of it: a system of manmade, clay tokens. Schmandt-Besserat (1997, 93) mentions:

“The Neolithic token system may be considered as the second step in the evolution of communication and data processing. It followed the Paleolithic and Mesolithic mnemonic devices and preceded the invention of pictographic writing in the urban period”.

As above indicated, related to the tokens system a number of discoveries indicate that people in the Middle Paleolithic period used certain techniques to keep quantitative records to support their track of memory, of their goods and maybe even because of ritualistic beliefs. One traditional example are notched bones that had tallied incisions with certain frequencies (ibid.,90). Schmandt-Besserat (1997, 91) indicates the following:

“This first step in “data processing” signified two remarkable contributions. First, the tallies departed from the use of ritual symbols by dealing with concrete data. They translated perceptible physical phenomena, such as the successive phases of the moon, rather than evoking intangible aspects of a cosmology. Second, the notched signs abstracted data in several ways”.

After these early attempts to keep track of experiences, the reckoning technology in notched bones was remediated. A great analysis is given by the author on foundational features that the newer data system had. For Schmandt-Besserat (1997, 97), the clay-token system emerged and grew into *standards* in terms of *semantics*, because each fabricated count meant and informed; *discreteness* because all units were unique to a meaning; *systematized*, where shape and meaning were kept the

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<sup>19</sup> William Warburton in the eighteen century indicated that primitive writing originated from narrative drawings observed along many different old cultures evidences. They were explained in a “three-step progression from ideographic to phonetic writing.” (Schmandt-Besserat 1997, 4)

same in any formation; *codification* in the sense of dealing with information in the same fashion, applicable to different items; *openness* seeing that new tokens could emerge if needed for new categories; *arbitrariness* in the light of token forms, at times abstract but also representations; *discontinuity* because related shapes could have been assigned to different concepts; *independence* of phonetics, as they referred to immediate goods and objects, independently of languages or prior representation systems; *syntax* being evidenced by use of rules and patterns and finally; *economic content* which was the specific human necessity in relation to goods. The key event is described once again:

“The tokens were an entirely new medium for conveying information. Here the conceptual leap was to endow each token shape, such as the cone, sphere, or disk, with a specific meaning. Consequently, unlike markings on tallies which had an infinite number of possible interpretations, each clay token was itself a distinct sign with a single, discrete, and unequivocal significance. While tallies were meaningless out of context, tokens could always be understood by anyone initiated into the system. The tokens, therefore, presaged pictography: each token stood for a single concept” (Schmandt-Besserat 1997, 93).

It must be noticed in this last passage, that the relation of clay instruments with the human body is fundamental. Different from a sign, they are graspable and represent in a one-one relation the existence of something in the realm of immediacy, a tendency that comes close to the view in Lakoff and Johnson (2003, 29) who express that “*there are few human instincts more basic than territoriality. And of exclusivity, the token system was highly accessible to people not aware of abstract systems; it was in a way self-explanatory because of its one-one correspondence, its tri-dimensionality and closeness to immediacy*”.

This allowed many to easily understand the system but precisely because of these considerations, their reckoning system was limited whenever it was confronted in quantitative terms. To solve this problem, the system became more formal and effective in terms of its computable principle. It went through a process of synthesis into pictograms, signs and codes in which it was necessary to be indoctrinated, to perceive the immediacy on what they were standing for. This optimization of the instrument brought changes into the society of men.

Neil Postman discusses in “The Disappearance of Childhood” (2011) the sense of literacy as a condition for decoding new data systems. There, he explores various perspectives on the relation between printing technology and the childhood concept after its appearance in the sixteenth and

seventeenth centuries. His basic claim is that in order to fit the structure of a new “print culture”, a break took place by declaring the existence of the childhood period. During this time, they, people of special needs and different nature, needed to learn how to read and write in order to join culture (Postman 2011, 37).

Being thus, it could be claimed that a basic cultural stage commenced after the introduction and extension of the “teaching machine” -using McLuhan’s term- when the popularity of the book rose pervasive. Owing to this setting, it was necessary to initiate people and lead them into interpreting the alphabet data system. Books such as the Bible were the first works to be massively printed. To access this kind of information readers had to make an important effort to decipher the complex sentences there recorded. To reach the completeness after the fragmented immediacy behind the sign, individuals needed to cross reference to provide further hints to construct better meanings. It was no easy task and for it, new mediations were necessary to accompany the medium. The church, schools and other bureaucratic systems worked accordingly in such terms.

All in all, the complexity created with the break improved the efficiency of the alphabet as a mechanical structure with a purpose. It allowed the construction of knowledge embracing the uncertainty behind existing concepts in each reader’s mind. As Dahlbom and Mathiassen (1993, 32) explain, “*these preconceptions will interact with the information we gain while reading, and they will influence our interpretation of the text*”. That meant that the major feature of ‘negotiation of meaning’ was considered, important because of being a key feature in knowledge construction according to authors such as von Glasersfeld and Wenger (2000).<sup>20</sup> However, it is clear that this remediation brought a challenge of fragmentation that separated those able to interpret the manufactured signs of special kind, and those who didn’t but still lived in the same society unaware of the hidden semantic world. Postman (2011, 13) explained the scenario:

“Literature of all kinds -including maps, charts, contracts, and deeds- collects and keeps valuable secrets. Thus, in a literate world to be an adult implies having access to cultural secrets codified in unnatural symbols. In a literate world children must become adults. But in a nonliterate world there is no need to distinguish sharply between the child and the adult, for there are few secrets, and the culture does not need to provide training in how to understand itself”.

Moreover, in another order of issues, it is important to notice the trade that was required in terms of physical characteristics. While with the token system of the Paleolithic the body was able to

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<sup>20</sup> To be further explained in section 3.7.

administer the instrument in an open manner, with the book as a remediated artifact the condition to access and construct processes of interpretation varies. In its formalized approach, the book detached itself from the human and acquired a level of mechanical independence without the need of humans' assisting its procedure.

To interact with it, the human physic is reduced to the visual channel and the mind. Postman indicates that "*with the printed book another tradition began: the isolated reader and his private eye. Orality became muted, and the reader and his response became separated from a social context*" (Postman 2011, 27). When reviewing such characteristics of the book medium contained in bigger bureaucratic structures, the correspondence reveals interesting perspectives where the shape and purpose define human spaces, as is the case with the use of the book in universities and their libraries, where it is still necessary and mandatory to remain silent inside the space designated for information of this kind. Kittler (2004, 245) offers his view:

"Most European universities came into being as extensions of former monasteries or cathedral schools. Therefore, they always possessed from the outset a library full of Latin manuscripts. This very wealth not only guaranteed the famous *translatiostudiorum*, transporting classical antiquity to the High Middle Ages, but also constituted a kind of hardware, a storage device just as precious as our hard drives".

With these examples, it is shown that intrinsic to remediation processes of human instruments, reduction and division are necessary to enhance development. This condition necessarily has an impact on human beings in their social formation. In *Tools for Conviviality* (1973), Ivan Illich highlights further examples fundamental to modern society, medicine being one of those. Since the artifact defines the boundaries of feasible standards in benefit of the mechanistic approach, he states that mediating structures such as medicine push back the native capacity of people to construct knowledge in those realms and grant the agency of interpretation to the bureaucratic system (Illich 1975, 35).

This instance illustrates rather clearly our previous claim because what it implies is that human beings are not entitled to interpret their own bodies without the medium of medicine. Processes related to intuition belong to a realm heavily questioned by our bureaucratic structure to approach natural phenomena, and allows few the space to go beyond the limits of the control range covered by the certainty of instruments. The analysis offered by Postman stresses the divide between illiterate and literate, childhood and adulthood, humans and mediums:



“From print onward, adulthood had to be earned. It became a symbolic, not a biological, achievement. From print onward, the young would have to become adults, and they would have to do it by learning to read, by entering the world of typography. And in order to accomplish that they would require education. Therefore, European civilization reinvented schools. And by so doing, it made childhood a necessity” (Postman 2011, 36).

In addition to our analysis, we address a second decisive reflection in the upcoming section. Keeping in mind our reckoning systems in early societies, we study the origin of ‘time’ not only as a formal structure, but also as a transcendental standard for instruments. While it is true that our natural mental process to break problems into units grew efficient in human practice, it was embraced as fundamental for artifacts. This was the predictable path to support the fragmentation of intuitive processes, to better trust our decisions in the light of that which is measurable and certain.

### 3.2.1. Reckon with time

In relation to instruments, humans attempt to bridge that which was never fragmented; *immediacy* that is. However, through layers of data, information and knowledge, individuals acquire a different experience of the same world, this time as a description. Artifacts become fundamental in this trade, because with their standards, descriptions can be coded for individuals to negotiate different perspectives.

Continuing with this idea, I have previously mentioned that to help us deal better with contents and information, our mediums are configured in obvious shapes for us to notice, but other times they tend to disappear. According to Bolter and Grusin (2000) this can be understood in terms of immediacy or »hypermediacy«. These categories are helpful because they describe media in terms of “*appeal to authenticity of experience*” (Bolter and Grusin 2000, 70). Moreover, to comprehend better the authors’ stance, both concepts are examined in the *psychological* and the *epistemological* category.

Thinking first of the term in its epistemological sense where cognition and mind are addressed, “*immediacy is transparency: the absence of mediation or representation. It is the notion that a medium could erase itself and leave the viewer in the presence of the objects represented, so that he could know the objects directly*” (ibid., 70), this would be the ultimate hope of virtual reality, for example, as their goal is to trick you into believing you have authentic interactions with authentic objects while in ‘reified’<sup>21</sup> environments.

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21 A concept to be further discussed in section 2.2.2

On the other hand, “*hypermediacy is opacity -the fact that knowledge of the world comes to us through media. The viewer acknowledges that she is in the presence of a medium and learns through acts of mediation or indeed learns about mediation itself*” (ibid., 70), in which case we should think of devices that augment our experience of reality such as the Google Glasses project (BBC, 2015) or using an interactive online application on your computer.

In terms of the psychological category, which alludes to the senses and emotions, Bolter and Grusin explain how “*immediacy names the viewer’s feeling that the medium has disappeared and the objects are present to him, a feeling that his experience is therefore authentic*” (J. David Bolter and Grusin 2000, 70); a description that could fit the sensation being caused if you close your eyes to be surprised immediately by believing a tiger is in the room, caused after someone or something played a high-fidelity sound of said animal.

*Hypermediacy* is distinct, where “*the experience that she has in and of the presence of media; it is the insistence that the experience of a medium is itself an experience of the real*” (ibid. 70). An illustration for this will be a massage chair in a VIP area of an airport. There you sit down to get a massage treat, knowing that there is no human presence doing this; you expect instead a mechanical medium to produce the exact effect as if a professional masseur were doing it. On account of this, Bolter and Grusin’s categories could be considered metaphors of different complexities.

In Ernst von Glasersfeld’s (1917 - 2010) theory on Radical Constructivism his profound study of human knowledge and its processes is known. Among the authors he followed closely, Jean Piaget was an important influence. Aware of von Glasersfeld’s warning (von Glasersfeld 1996, 58) on isolating key terms of Piaget’s knitted conceptual network, I refer to a general foundation that I consider basic to contextualize the understanding of my forthcoming arguments.<sup>22</sup>

Until now, we have talked about immediacy as the quality of bringing one into direct involvement with a “something”, and for this, I have introduced the concepts of *actual experience* and *immediate unit*. These notions match von Glasersfeld’s clarification, for he embraces knowledge not as a picture that improves by interacting more and more with the something, nor as plain stimulus-response mechanism. Instead, knowledge is a continual construction or a »reality« which is the experiential world (von Glasersfeld 1996, 57) being carried out by cognizant entities with a purpose, never random. This is explained in Piaget as a context of “action schemes” (ibid., 73).

Similarly, seeing that *immediacy* and *hypermediacy* stand for qualities of “*being immersed*” and

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<sup>22</sup> In page 62, I raise more considerations bonded to von Glasersfeld’s analysis on Piaget’s cognitive developmental theory, which he described as “a way of organizing an observer’s view of developing children”. I will cover concepts such as action schemes, individual identity, proto-space and proto-time, assimilation, perturbation, accommodation, equilibration among others.

“*being interrelated or connected*” (J. David Bolter and Grusin 2000, 232), the claims raised in this thesis are linked to the latter. As will be suggested, the intrinsic quality of instruments within learning spaces are not to abduct minds away from bodies, as it happens while immersed in transparent artifacts, but to augment the referential structure of data and information in the experiential space, that is, in the experiential world:<sup>23</sup>

The hypermediated self is a network of affiliations, which are constantly shifting. It is the self of newsgroups and email, which may sometimes threaten to overwhelm the user by their sheer numbers but do not exactly immerse her (J. David Bolter and Grusin 2000, 232).

In the spirit of adding new textures to the *immediacy* and *hypermediacy* concepts, I like to think of them in connection with two other classical perspectives for our further analysis: »transparency« or »opaqueness«. They can also be well understood in relation to McLuhan’s general classification of mediums. For it, he explained, there were two major categories denominated »hot medium« and »cool medium«. In his words:

A hot medium is one that extends one single sense in “high definition.” High definition is the state of being well filled with data. A photograph is, visually, “high definition.” A cartoon is “low definition,” simply because very little visual information is provided. Telephone is a cool medium, or one of low definition, because the ear is given a meager amount of information. And speech is a cool medium of low definition, because so little is given and so much has to be filled in by the listener (McLuhan 1994, 23).

To my mind, *transparent* instruments have a tendency to become hot mediums, due to the shared purpose of immersing individuals in a deceitful experience that brings immediacy to them. For it, large amounts of data must be fed into the confines of the artifact’s setting. The opposite happens with *opaque* instruments, still interested in efficiently meeting all standards towards formalization but next to it, such mediums are in need of humans being aware of them, agreeing with their presence on controlled terms. It is a trade that society must accept in order to make use of such instruments.

In this sense, they can be better understood as *cool mediums*, because their processes and remediations are not interested in mimicking reality, but more into optimizing data systems and managing large amounts of ‘ephemeral’ events. Think of the popular web-based application *Twitter*, an

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23 To be further developed in section 3.1.5

online service in need of few elements, limiting and forcing people to a unit called “tweet” which allows just 140 characters for users to create messages. In it, some featured syntax introduces artificial strategies. Like the hashtag(#) <sup>24</sup> used in this software to declare topics, it remains a mechanistic approach that benefits the bureaucratic system in its complex operations of data collection, away from human awareness. What society meets is simplicity, a refined instrument with a known purpose: re-enacted immediacy through ‘speed’ and ‘ephemerality’. This is implicitly expressed in their presentation webpage by stating that “*the best Tweets share meaningful moments — big and small. Quote your grandma, share a photo of your pet sloth, or make a Vine video of your youngest doing a tricycle wheelie*” (“Story of a Tweet” 2015).

There is also another reflection to stress as I continue with the Twitter software instance. By doing this, we will be able to study the shared aspect of *reckoning*, our natural capacity which already in the Paleolithic age inspired the creation of the token system, afterwards taken up by writing and still today, crucial for the computer machine. An example of this aspect is to be found in Twitter’s “About” webpage, where they describe the possibility of having a personal profile in their service in the following way: “*Your Twitter profile shows the world who you are — moment by moment*” (“New Profiles Are Here. | About” 2015). This sentence is preceded by a large image, that I invite you to observe in Fig.02.

Within these block of information, we can find different key elements previously discussed in terms of our relation with instruments. To do so, I analyze Twitters webpage sentence in the following way: “*you*”, a person, a whole, a user who *-now appears as a break-* being showcased through a Twitter profile, the artifact that bridges and helps you *-another break-* be presented to them, the world, society, *-another break-* after a *moment by moment* sequence, that is, a collection of personal and fragmented events being reckoned *one plus one*. Moreover, an image appears where a fragmented sequence is showed: two mobile telephones are equipped with the Twitter application and show a profile containing the picture of a female in an outdoor photograph.

We notice that the relation of elements differs depending on the mobile automaton. They are the top of the sequence. Below is another profile construction, of you, bigger and suggesting that it’s being exhibited somewhere different, I presume in the computer where you are accessing this same information, this same “you” but portrayed *-interpreted-* as information with different aesthetics.

Let’s remember, all through these layers the same information is being offered. Still a last and distant layer is blurred. It seems to match some colours and shapes of the outdoor picture that is

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<sup>24</sup> A Tweet is an expression of a moment or idea. It can contain text, photos, and videos. Millions of Tweets are shared in real time, every day. (Story of a Tweet)

sharply highlighted in the remediated reality of “you”, in each of the Twitter software depictions. This distant and blurry image, I interpret, is the world of the immediate, the whole, where you are and who you are. Because of the overlaying of the Twitter surfaces and its blurred appearance, one can't tell the nearness between it and the Twitter representation. Here, the artifact isn't trying to trick you into anything; it is imposing a particular way of representing “you”, which follows an opaque approach in order to help us get to know a rich fragmentation of “you”, surely based on data of immediacy. Twitter in this case, avoids the imitative reproduction of transparent mediums.



Fig.02. Fragmentation of reality in Twitter. Profiles section in Twitter webpage. (“New Profiles Are Here. | About” 2015)

At the end of the last section, I announced that a second debate related to fragmentation processes during human experiences is necessary. The claim was illustrated by sharing some thoughts on reckoning, all in relation to the formal operations that assist us in constructing ‘abstractions’ based on perception, a natural formalization that has happened since Paleolithic times and was later taken up by certain instruments. This setting contributed largely to creating our notion of standardized time.

Whenever we reckon, we are interpreting information and data available in the experiential world, and to keep formal track of it we get served by »abstractions« among other possibilities. This is meant as that human capacity where we substitute “*a kind of place-holder or variable for some of the properties in the compound sensory structures we actively build up to form particular things from the*

*flow of experience*" (von Glasersfeld 1996, 93); here a direct link to computing machines is given as he sees "no reason why the resulting operational structure that has the function of a generative programme, should not be called a concept" (ibid., 93).

Abstractions happen within the process of reflection. In it, we "step out of the stream of direct experience, to re-present a chunk of it, and to look at it as though it were direct experience, while remaining aware of the fact that it is not" (von Glasersfeld 1996, 90). This description is completed by the author while offering another hint about the affinities between human procedures and certain instruments -computers without question-. In humans, he says, the act of reflection is a "mysterious" ability to organize experience in sequences of related smaller fragments which means that to "*grasp as a unit what was just presented is to cut it out of the continuous experiential flow*" (ibid., 90). This feature is essential in mediums like computers, because they mechanically imitate logical procedures based on protocols fed into their software by humans. Consequently, we say that both instruments and humans share this operational way of breaking and fragmenting towards clarification and operationalization of information.

To increase understanding in this regard, it is advisable to study further Silvio Ceccato's hypothetical model on successive frames, where the author stresses his inspection "*among the most intriguing human activities that can never be directly observed,*" (von Glasersfeld 1996, 77) with reflection still in mind.

To explain it, he describes the topic in the matter of "*mind operations*", alluding to the human capacity in its mechanic-like fashion. However, he is particularly interested in following Ceccato's conceptual analyses in terms of »change« as the key term that boosts our reflective processes. Von Glasersfeld highlights the importance of memory in order to undergo change in the moment we "*consider at least two moments of experience and spot a difference*" (ibid., 80). He describes the process:

Ceccato's method consists in mapping the minimum requirements for each frame. We therefore mark two moments of the experiential flow:  $t_1$  and  $t_2$ . To speak of 'change', we also need the perception or conception of a difference (von Glasersfeld 1996, 80).

In order to exemplify one of the typical diagrams developed in Ceccato's analysis of meaning in language, I take von Glasersfeld's example of the English verb 'to arrive'. According to him, it "*needs at least three frames. Two to indicate that the active item X changes location, and two, to indicate that it comes to a state of rest*" (ibid., 83).

FRAMES	t1		t2		t3
SAME OBJECT	X	=	X	=	X
LOCATION	loc.n	=/	loc.'here'	=	loc.'here'
CONDITION	(motion)			(state)	

Table 01. Diagram of the English Verb 'to Arrive' (von Glasersfeld 1996, 83)

While the formality of the exercise is clear in its approximation, the author indicates the “*the concept of ‘change’ requires a difference received in an object that is considered the same object at two moments in the flow of experience*” (von Glasersfeld 1996, 81). In such terms, it is relevant to notice that among the metaphors used by von Glasersfeld to explain this conceptual structure, he evokes media, in this case *cinema*:

“it will be sufficient to say that Ceccato’s method consisted in viewing sensory experience much like cinema film, made up of a sequence of still ‘frames’” (von Glasersfeld 1996, 78).

If we look into cinematographic history, a short tale enlightens our arguments and the reason von Glasersfeld compares a method on mental processes to the one carried out by a piece of technology; because by the time photography was spreading all over the world, the human eye was not the right medium to create evidence about natural phenomena. In need of a method to bring certainty, photographer Eadweard Muybridge worked together with Leland Stanford inspired by one simple question: “*is a running horse ever completely aloft?*” (Leslie 2001). At a racetrack they wrote history because frame by frame, one plus one, they fragmented the enigmatic run of the animal to reveal an agreeable perspective to their question. With a sequence of cameras on one side of the track facing a wall of white sheds across, they isolated the figure of the horse that ran throughout the setting.

“Within 20 minutes, Muybridge had developed the plates and laid out the results for the visitors to admire. The series made a brief filmstrip of the horse’s progress along the track—capturing, for the first time, ephemeral details the eye couldn’t pick out at such speeds, such as the position of the legs and the angle of the tail. Stanford got the evidence he wanted, and the world got a stunning dissection of motion” (Leslie 2001).

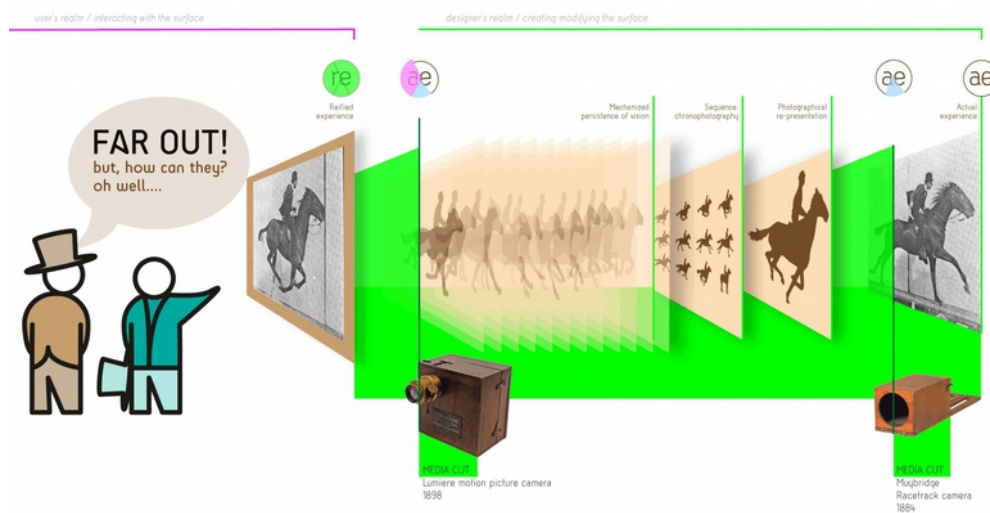


Fig.03. Interpretation of the Muybridge & Stanford story.

In the diagram above (Fig.03.), we can see an interpretation of the Muybridge & Stanford story. A problem is pictured at right of the scene, it lies in the realm of *actual experience* (AE) which our inaccurate senses cannot do much to disclose. To obtain a more certain and formal explanation on the issue, they pursue Muybridge's racetrack experiment. Here, a break is generated in order to divide and conquer the understanding of an un-sharp area of their experiential knowledge. The result is a series of representations of a mechanical kind known as chronophotographic sequences where movements of human beings and animals are broken into units of change as the event takes place, thus understood in detail. In this case, the *same object* "horse" was studied frame by frame in order to unveil objectivity and prove that indeed, there is a moment in an open race where the animal is suspended in the air. Artists were directly addressed by the new medium and its irrefutable evidence:

"Artists of the day were both thrilled and vexed, because the pictures "laid bare all the mistakes that sculptors and painters had made in their renderings of the various postures of the horse," as French critic and poet Paul Valéry wrote decades later." (Leslie 2001).

This was just the beginning. Soon after, "movement dissections" offered new hints once all separated scenes were reunited again. Together, *one after one*, they were able to reenact the movement inspired out of immediacy. A new remediation phase took place and 14 years later motion picture sequences were implemented. This is the *cinema* metaphor von Glasersfeld mentions when thinking of Ceccato's work on the human mind; an instrument with a feature that juxtaposes representations in



sequence; it was a new form of recording information taken like human capacity while reckoning. However, in the moment of *reification of experience*, the actual experience is blurred in the distance, hidden by a series of fragmentation processes that give transparent feedback impossible for the untrained spectator to notice.

In other terms, it could be said that humans interpret data and information through a process we have denominated reflection. However, implications on the manner we experience the world and interact with others become diverse. This kind of differentiation, intimately connected to mediums, is noted by Postman when he differentiates words from pictures, one offering a concept, the other delivering a mimicry of a thing:

The printed word requires of a reader an aggressive response to its “truth content.” One may not always be in a position to make that assessment but, in theory, the assessment can be made -if only one had enough knowledge or experience. But pictures require of the observer an aesthetic response. They call upon our emotions, not our reason. They ask us to feel, not to think. This is why Rudolf Arnheim in reflecting on the graphic revolution and anticipating its massive manifestation on television warned that it has the potential to put our minds to sleep (Postman 2011, 73).

It is also important to notice that when we reckon we are creating »re-presentations«: a *unit* that stands for “a something” within the arena of natural phenomena. According to von Glasersfeld, it should be read this way instead of *representation*, an essential difference in comprehending the meaning of some of Piaget’s basic terms, and those exposed by Immanuel Kant. Given that language plays a significant role in the writing of Radical Constructivism, a basic translation problem arises in the proper understanding of the work of both authors:

“It may have started earlier, but it became common usage in philosophy with the translation of Kant’s *Critique of Pure Reason*. The two German words *Vorstellung* and *Darstellung* were rendered by one and the same English word ‘representation’. To speakers of English this implies a reproduction, copy, or other structure that is in some way isomorphic with an original. This condition fits the second German word quite well, but it does not fit the first. *Vorstellung*, which is the word Kant uses throughout his work, should have been translated as ‘presentation’, because it designates, among other things, the ‘performance’ of a magician, and one would use it to ask a theatre: How many ‘shows’ are there on Saturday? The conflation of the

two concepts is obviously disastrous in epistemological contexts.[...] If it is lost, one of the most important features of Kant's (and Piaget's) theory becomes incomprehensible" (von Glasersfeld 1996, 94).

On the other hand, following Piagetian logic, a *re-presentation* indicates a repetition of a unit that was experienced in order to re-create something out of memory for itself; a principle carried out in calculation processes -such as the token system- in order to manage abstraction. However, the importance in the *hyphen* according to von Glasersfeld lays in the fact that it emphasizes the particle "re-" to make clear the existence of something being repeated, calculated, computed out of prior abstracted processes (von Glasersfeld 1996, 95).

But to re-present a concept, there must be an act of »recognition« of the unit to call for a *re-presentation* in its name, a sense of sameness of an object previously fixed in memory that now appears changed. An example is given in the case of words when we discriminate them as signals or symbols. In the first case, a word is a command that causes a (physical) action in response but in the second case, a word brings forth an abstracted re-presentation, numbers when reckoning for example, which are conceptual structures that must be generalized (von Glasersfeld 1996, 99).

In Ceccato's method, the employment of numerical notions is suggested based on "*the idea that the structure of certain abstract concepts could be interpreted as patterns of attention*" (von Glasersfeld 1996, 167), a moment of pure mental processes in no need of a particular sign, an "*iteration of pulses*" as he describes:

...one is faced with the puzzling question how such obviously fallible actions can lead to be certainty that mathematical reasoning affords.

The model's answer to this puzzle lies in the fact that in the construction of the abstract concept of numbers all sensory material is eliminated. Although the numbers "1", "2", "3", and so on, were originally conceived with the help of experiential *things*, their sensory properties were dropped during the two steps of abstraction, first of units and then of units of units; and when we operate with abstract entities, we do not question that they are indeed abstract and no longer subject to the fallibility of sensory perception (von Glasersfeld 1996, 174).

With reference to previous arguments, a second debate related to fragmentation processes occurring during human experiences is pertinent. To the extent of their possible identification in relation to certain instruments, it is possible to discuss "organic" instances with formal characteristics

taken up by bureaucratic-driven entities in order to conduct remediation processes in new ways. An example is to be found in the standardized record of units between dusk until dawn, namely our time measuring system. For it, man-made machines like clocks emerged, able to homogenize the implementation of time in human structures.

According to the Oxford Dictionary (2013) the word “clock” comes originally from the late Middle English, from Middle Low German and Middle Dutch *klocke*, based on medieval Latin *clocca* which is the word for “bell”. I find it useful to look into the outset of this word because as noticed, the term is conceived based on its sound. While reckoning improved the first systems of measures, it was not strictly the haptic domain which was remediated but its combination with mechanical structures based on visuals and sounds (e.g. the sound signal of the clock announcing the time frequencies during the day). However, our eyes are largely trained to help us keep track of changes: we recognize concepts, experiences and representations to re-present them to ourselves. In spite of that, a natural countable connection binds us to the sense of past experiences, owing to a succession of frames in altering condition. These frames are units and with them, we grasp a dimension of continuation and information stacking in memory. Schmandt-Besserat (1997, 101) says:

“According to Alexander Marshack, the first item counted was time. Each notch engraved on a bone represented one sighting of the moon. The theory that tallies were calendars is plausible because lunar notations would make it possible for dispersed communities to gather at intervals to reaffirm their ties and celebrate rituals”.

McLuhan tells further about the origins of mechanical clocks, this in “*times of medieval monasteries, with their need for a rule and for synchronized order to guide communal life, that the clock got started on its modern developments*” (McLuhan 1994, 146). A mechanical instrument to create duration in society, its novel feature was the possibility to grant standards in the production of units named ‘hours’, ‘minutes’ and ‘seconds’. Still today, human settlements guard the tradition of a town-bell. After its signal, they react in various ways and information will be decoded: the farmer will start or call it a day, people will attend religious services or even raise a prayer on behalf of a dead person who is about to be buried; many meanings all coded on the sound of hollow metal objects dispersing over men. It is a sort of standardization for a *many* under *one* common structure. With the popularization of mechanical clocks, our everyday turned out to be quantifiable in a numeric way and “*not only work, but also eating and sleeping, came to accommodate themselves to the clock rather than to organic needs*” (McLuhan 1994, 146).

It is certain that men came up with time-measuring methods in the early stages of society, and while on many occasions their interest was intended for keeping records about astrology, seasons, crops and to organize past experiences, there was not one ruling approach to do this. In his chapter about clocks, McLuhan (1994, 146) offers some examples where scents were used to map time, believed for a long to be the “root of memory”. Among them the Chinese and Japanese before the seventeenth century measured time-related issues with incense. However, as in digital media, the general is always present and articulated by the action of interrelated mediums. The sound of one bell for the general to ensure efficiency of a growing society; for it mankind was in need of standards and thus, to expand into new shapes. With the clock, a layout fragmented the perception of routines and brought a tool for citizens to get through the new social order. Soon enough, the acceptance of this machine became undisputed.

The significance of this perspective is vital because it allow us to identify the embedded element of human-adopted structures, implemented to favour mechanical approaches and consequently, bureaucratic organizations and its instruments. These extensions of men grew further, but the consideration of our human condition was certainly remediated and blurred by fragmentation. Bollnow explains a different perspective of human time, in his book *Human space*:

“The clock no longer warns us of challenges that lie ahead. It is only the course of the day, the movement of the sun and stars, that reminds us of the presence of time. But, in contrast to the hurry of the country road, it is a different, restful and calming rhythm that takes hold of us here” (Bollnow 2011, 112).

In the first scenario we have the bell clock, a tool, helping us to organize socially and be part of a larger mechanism to enhance productivity in terms of formalization and networks. The bell in medieval times was a powerful ubiquitous medium spreading over many with a coded sound system. No one needed to carry anything extra to collect data or to efficiently decode the message being spread by someone tolling bells.

On the other hand, in Bollnow’s reflection, we have the body, our interconnected senses as interface, mapping the course of the day in its changing nature. In his version, we encounter a key element that becomes intrinsic to time: *speed*. Without the predictive device warning us of challenges to come, the rhythm of man not now (time related), but here (space related), manifests in a quieter pace. Both scenarios embody and describe essential elements for the construction of our society: our organic structures are aided by mechanical instruments and both can be understood strictly within their dialectical relation. Accordingly, I share Barnett’s position where time and space come together,

and are not separable.

“In the university of the twenty-first century, space and time are, therefore, intimately connected; inter-connected, indeed. It was also thus, of course, ever since the modern university’s inception in the Middle Ages. Then, the scholars of Europe travelled across those countries and were conscious of the temporal conditions of their calling not least as they discovered the work of Aristotle and other Greeks” (Barnett 2010, 72).

This position has been explored profusely and following a similar line, authors such as Mikhail Bakhtin with his general concept of “chronotope” in his work *“Forms of Time and of the Chronotope in the Novel”* explains the relation of both concepts in its integral quality:

We will give the name chronotope (literally, “time space”) [...] In the literary artistic chronotope, spatial and temporal indicators are fused into one carefully thought-out, concrete whole. Time, as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot and history. This intersection of axes and fusion of indicators characterizes the artistic chronotope (Bakhtin 1982, 84).

McGregor (2003, 357) considers both terms united explaining that “...*the notion of Spatiality (or space-time) is more than physical or social space. It is the recursive interplay between the spatial and the social, the product of complex ongoing relations*”. All in all, in this thesis both concepts are considered in its indivisible relation.

The harmony however is lost whenever we act in the hope of instruments; as soon as we think “*the computer is the solution, then information is the problem*” (Dahlbom and Mathiassen 1993, 1), a predicament urges us to identify our real challenge in learning spaces, for example, where it is clear that the creation of knowledge remains the problem, without any clear solution.

Barnett extends this idea with an interesting perspective as he talks of »spacious time«. With this argument, he broadens the necessary critique meant for higher education, however applicable to other social structures influenced by the mechanical approach. A totally different scenario is presented that is beneficial to the mechanical view where time is not spacious enough and different from that “*crowded, dense and thickly populated*” (Barnett 2010, 76), bringing humans into “*multi-tasking*” practices and seeking the creation of multiple instances for one single task.

Here is an asymmetrical approach where the mechanistic setting is forced on human beings in their

need of *spacious time*. Whereas since for a computing machine this would be no problem and their remediation trajectories go traditionally in the direction of speed and capacity, this could become an exhausting challenge for a human being:

So the greatest of all reversals occurred with electricity, that ended sequence by making things instant. With instant speed the causes of things began to emerge to awareness again, as they had not done with things in sequence and in concatenation accordingly (McLuhan 1994, 12).

Referring to von Glasersfeld's notion of *experiential reality*, it is clear that if each constructs its own reality, as Piaget well affirmed, there would a necessary contradiction in pushing organic society into bureaucratic designs of efficiency, where experience is assessed in the light of fixed criteria and is of one kind and standard to all. This is unlike for von Glasersfeld, where we learn that starting with the process of abstraction and concepts creation, humans interpret attentional frames that are mapped and compared always attentive to change.

Among different aspects, this can be explained thinking of our memory capacities, re-presenting and abstracting. The world we interpret is constructed strictly out of our active engagement with it and awareness. As sequences of images and changes occur, our perception of time is created as a direct result of sequenced frames of change and or continuity. "*The structure of temporal relations is thus generated by superimposing a sequence of actual experiences on a continuity that is not in the experiential field and has itself no articulation*" (von Glasersfeld 1996, 87).

These processes become declared and negotiable with others only through the assistance of instruments; but if mechanical, the principle behind such operations and ultimately goal is optimization and for that, the human body is no longer necessary but the speed of data interpretation is. This conflict becomes one of the important challenges in this thesis. After such a scenario, Barnett is inspired by Paul Virilio to offer a question of humanistic dimensions as follows:

But, now, increasing speed is leading to a situation that is much less under control.

'What will we wait for when we no longer need to wait to arrive?'

(Barnett 2010, 113).

In the same fashion, a research report from Ludwig Maximilian University in Munich, Germany, may be useful for this debate. Time in their case, is observed as a phenomenon where mechanistic thinking challenges the biological notion that may be noted closer to the world of natural phenomena. Known as "Social Jetlag" (Roenneberg et al. 2012), their work is named metaphorically in relation to

the event that happens when a traveler moves from one time-zone to a different one around the world, causing his traditional organic routines (sleep duration and eating habits) to be altered.

For this, our body and its “body clock”, naturally synchronized to the “sun clock”, which is lightness and darkness, must adapt anew to the latest set of conditions. For them it is the “social clock”, which for me is the bureaucratic clock. In their debate, they affirm that because of work frames and ruled schedules, a big difference exists between all these “clocks” and this event affects individuals as we try to obey the radical conditions stipulated about production and efficiency.

Our work system, a kind of opaque medium, encourages ‘users’ to remain indoors and through manufactured objects<sup>25</sup> ignore the natural conditions dictated by the “sun clock”. The tradeoff is that our human nature is necessarily affected to meet all mechanical conditions that are beneficial for the optimal state of the instrument, and in this case, what they claim is a direct correlation with “nutrition issues, alcohol consumption and obesity”, as some of the first indications. The benefit according to Illich, remains for the bureaucratic system:

New power meant a new relation to time. The lending of money against interest was considered “against nature” by the Church: money naturally was a means of exchange to buy necessities, not a capital that could work or bear fruits. During the seventeenth century even the Church abandoned this view’ -- though reluctantly—to accept the fact that Christians had become capitalist merchants. Time became like money: I now can have a few hours before lunch; how shall I spend time? I am short of time so I can’t afford to spend that much time on a committee; it’s not worth the time... It would be a waste of time; I’d rather save an hour (Illich 1975, 23).

Conceiving of them as »commodities«, these are artifacts we were never in need of, but because of fragmentation processes and in order to continue bridging media breaks, actual perception entitles the system to move on by using methods that dismantle us from our bodily interfaces and offer instead different artificial mediated interfaces, accurate and reliable as they are.

By the time Bolter and Grusin wrote their overviews and reflected about the concept of remediation, they studied a kind of medium which was technically faulty, slow, and crashed (J. David Bolter and Grusin 2000, 22); such characteristics made it still opaque to humankind. In the meantime, 15 years have passed and most of these issues have disappeared as new automata become closer to immediacy and faster to ‘reified experiences’. This trajectory of new instruments being remediated goes

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<sup>25</sup> Further examples inform about sleep problems and “adverse consequences on general health”. The use of light-emitting digital devices before bedtime are directly pointed to cause the problem. (Chang et al. 2014)

on and with them, the organic society in different aspects of humankind. A major challenge lies ahead in terms of how to match the speed and the ephemeral shape of a liquid society<sup>26</sup> that has become unbearable for many, as global movements begin to rise claiming to slow down pace or 'rewild' our systems.<sup>27</sup>

All our knowledge brings us nearer to death,  
 But nearness to death no nearer to God.  
 Where is the Life we have lost in living?  
 Where is the wisdom we have lost in knowledge?  
 Where is the knowledge we have lost in information?  
 Fragment, Eliot (2015).

In Digital Media, the general is always present. But this 'reified experience' of the general is constructed out of many fragments, like disciplines in their different specificities. On the other hand, our *experiential reality* aims to grasp one universal place that is never "truly" conceived, this I mention after von Glasersfeld and Piaget's lesson. In the upcoming section, I continue following a line of critical remarks, with examples showing how it is that one of our most developed instruments, a computing machine that later became an automaton, continues an admirable evolution towards immediacy, transparency and ubiquity. For this, it is needed to recap what is man's role in the meantime.

### 3.3. MECHANIZATION OF THE MIND / HACKING HUMANITY: A MACHINE BETWEEN US

"Electronic computers were built to replace human computers," said Dahlbom and Mathiassen (1993, 6) in one of their starting lines as they oversaw the mechanistic heritage of men. The authors described further, this time not as daringly, that our traditional bureaucratic systems are meant concordantly to assist human practices. In order to achieve that, decision makers cannot but interpret such practices in their contexts, like anthropologists do when they observe people while interacting (ibid., 27).

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<sup>26</sup> A concept introduced by Barnett, to be further discussed in section # of this thesis.

<sup>27</sup> The emergence of concepts such as 'degrowth' and 'rewilding', close to the ideals behind the Slow Movement and the Convivialist Manifesto (p.217), evidence the expansive interest throughout different sectors to find solutions against the primacy of economic growth, non-reflected production and the pace of processes. In section 2.3.3 I will explain this idea more fully.



As old as early civilizations with their first attempts to understand the world more precisely, our fascination with instruments in newer and efficient shapes has a deep connection. However, as mediums get developed, the complexity and fragmentation we inflict on the *actual experience* perceived by our corporeal senses, is blurred instead by the *reified experience* offered by machines of certainty. It is unnecessary to judge whether good or wrong, since this would only mean one takes sides and abandons the constant movement of the changing context. One must keep attentive and critical of decisions, just like the anthropologist or the traditional system does, when studying human practices.

Earlier we spoke of three different kinds of instruments we make use of: *tools*, *machines* and *automata*. The difference among them implies, roughly, a certain level of intimacy and interconnection with humans. In the first category, instruments are absolutely dependent on the human and its influence, but in the last category, the closeness and intimacy of a trade changes dramatically as the automaton hardly needs the intervention of a man to function, and actually, it tends to disappear from awareness of men to accomplish its task. This in turn supposes a different impact on both results and relation to humankind; a highly developed sophistication which becomes almost immaterial, moving throughout abstractions and algorithms, just like a good traveller does. Light and unnoticed:

What makes a mechanism is the separation and extension of separate parts of our body as hand, arm, feet, in pen, hammer, wheel. And the mechanization of a task is done by segmentation of each part of an action in a series of uniform, repeatable, and movable parts. The exact opposite characterizes cybernation (or automation), which has been described as a way of thinking, as much as a way of doing. Instead of being concerned with separate machines, cybernation looks at the production problem as an integrated system of information handling (McLuhan 1994, 248).

If we were to define the core of digital media and more concretely, the implications for humans when »programming« computing machines and automata, we could say one "*thinks as a machine would think if it could*".<sup>28</sup> In other words: in relation to computers we share a highly abstracted and formal language; for that reason the human reflective process engages in a metaphor inspired by our rich and "mysterious" setting of constructed knowledge and intentionally formalizes it into a thinking-like process meant for a limited artifact. For this, we make use of different signals and symbols which

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<sup>28</sup> "*To think as a machine would think if it could*" its a phrase you will often hear from Prof. Dr. Frieder Nake whenever he explains the topic concerning computers and what is programming. According to him, this is the very core of what we do when programming. However, when we refer to digital media he extends using the same formula, this time dressing with different elements; "*to think in the algorithm as an automaton*". We will refer further to this aspect later on in this thesis.

are abstractions from our thinking process since they must be adapted to conditions.

When doing this trade correctly, we feed known operations into a machine to make it do a human-like action. In the words of Wiener (1965, 25:39), “*the wonders of the automatic computing machine belong to the same realm of ideas, which was certainly never so actively pursued in the past as it is at the present day*”. The principle of programming is to be found in multiple historical instances. However, there is one that I find specially interesting because the word to be used in a mythical context, is used equally in the context of automata. It is helpful to remember Lakoff and Johnson (2003, 185):

Incidentally, we are not using the term “myth” in any derogatory way. Myths provide ways of comprehending experience; they give order to our lives. Like metaphors, myths are necessary for making sense of what goes on around us. All cultures have myths, and people cannot function without myth any more than they can function without metaphor. And just as we often take the metaphors of our own culture as truths, so we often take the myths of our own culture as truths.

According to a Jewish oral and literary tradition originated in the 13th-century, a »Golem« is a “*figure out of clay or carved from wood, who, like real men, would perform whatever task was asked of them. Such home-made servants are very valuable: they do not eat; they do not drink; and they do not require any wages. They work, one can scold them, and do not answer back*” (Kieval 1997, 1).

Following this description apparently, the Oxford Dictionary (2013) accepts both meanings -the Jewish legend of a “*shapeless mass*” and the automaton or robot- related to the word, a version that matches Kieval’s text linking it with “*cybernetics and artificial intelligence*” (Kieval 1997, 2). The hint to programming in this myth is found in a letter written in 1674 reported by the author in his article. There, a Jewish source describes the ritual to create and command the *Golem*:

On the forehead of the image, they write: *emeth*, that is, truth. But a figure of this kind grows each day; though very small at first, it ends by becoming larger than all those in the house. In order to take away his strength, which ultimately becomes a threat to all those in the house, they quickly erase the first letter *aleph* from the word *emeth* on his forehead, so that there remains only the word *meth*, that is, dead. When this is done the Golem collapses and dissolves into the clay or mud that he was (Kieval 1997, 3).

In this description, concepts of importance to this thesis are present: “truth” in the mechanistic approach and the importance of the written word within a given syntax, the unimportant shape of a

being that expands itself next to a power structure between one controlled and the controller. Certainly in 1674 no computer nor robot was there, but the idea of an entity capable of reproducing our fragmented actions based on a protocol was certainly jumping out of the mythical scene.

The constructed metaphor comes to hand when the second meaning is included, *the robot*. In this case, the machine exactly like the Golem, is able to perform human tasks of great complexity after declared words with known syntaxes. Originally it is a word from Czech, from *robota* 'forced labour', this was a term coined in K. Čapek's play R.U.R. 'Rossum's Universal Robots' (1920). (Oxford Dictionary 2013). The main difference we find in the case of the robot is its close value of anthropocentrism. This is well explained by Wiener:

This desire to produce and to study automata has always been expressed in terms of the living technique of the age. In the days of magic, we have the bizarre and sinister concept of the Golem, that figure of clay into which the Rabbi of Prague breathed life with the blasphemy of the Ineffable Name of God. In the time of Newton, the automaton becomes the clockwork music box, with the little effigies pirouetting stiffly on top. In the nineteenth century, the automaton is a glorified heat engine, burning some combustible fuel instead of the glycogen of the human muscles. Finally, the present automaton opens doors by means of photocells, or points guns to the place at which a radar beam picks up an airplane, or computes the solution of a differential equation (Wiener 1965, 39).

Following this hint, in Wiener we see a clear connection of the human body being remediated by artifacts. To no surprise, the concrete metaphor of human-like machines has been there for ages, probably close to the development of artifacts that mimic practices and natural phenomena. Horakova speaks even of "*an attempt to imitate a 'Creator', to make a creature in our own image or even to discover the secret of life*" (Demers and Horakova 2008, 435). Čapek himself wrote about how he came up with the name of his play:

Robots were a result of my traveling by tram...People were stuffed inside as well as on stairs, not as sheep but as machines. I started to think about humans not as individuals but as machines and on my way home I was thinking about an expression that would refer to humans capable of work but not of thinking. This idea is expressed by a Czech word robot (Demers and Horakova 2008, 435.)

The *golemic* character embedded in the term *robot* is to be found in the key phrase "*capable of work but not of thinking*", an idea that meets in a way "*thinking as a machine would think if it could*". In

their document, Demers and Horakova explained that automata were characterized not only by their staging, but also their aspect. It is reported that automata projects in the 18th century were designed to mimic the looks of children, which could be interpreted as innocent representations able to manipulate spectators, still learning and therefore still in a process of avoiding failures in their actions. According to the authors, “*these automatons’ ontology was masked/camouflaged and interpreted as an ambiguous fluctuation between the mechanic and organic, between living and non-living*” (ibid., 436).

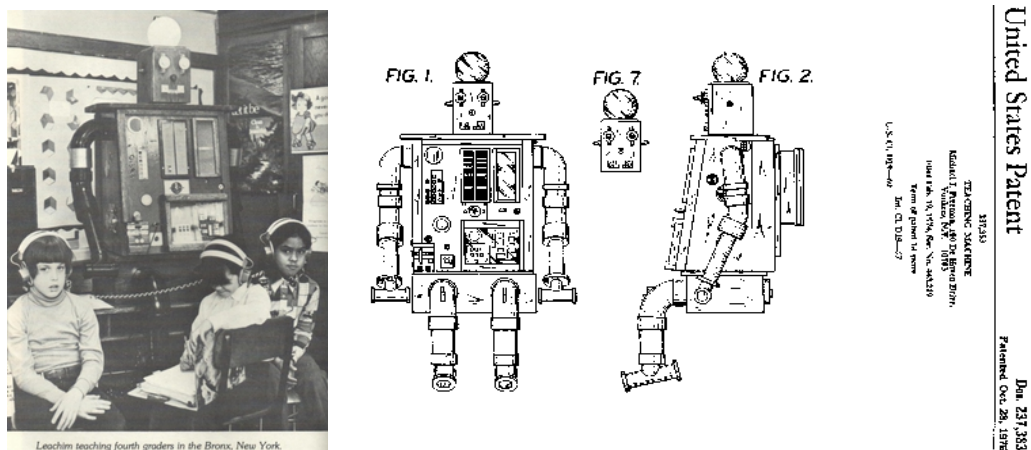


Fig.04. Prototype and 1975 United States design patent for Michael J. Freeman’s “*Teaching Machine*” (Hoggett 2015)

With new developments and technical advancement, the robots as if they were a man metaphor kept offering alternative scenarios where automata appliances pushed new limits, it still does. Forty years ago, as shown in Fig.04, the anthropomorphic fashion remained the criteria to care about in the aspect of robots, in it a concrete allegory of the robot instead of man. Dr. Freeman’s “*Leachim*”<sup>29</sup> was an automaton we could think of, aimed to remediate McLuhan’s idea of the book as the “*teaching machine*”, but at the same time the instructional duty of the human in class. In his words:

[...] when listening to his wife, Gail, complain about teaching the intellectual mix of students in her fourth-grade class in the Bronx. To help her out, Freeman built her a teacher’s aide. [...] Freeman recorded everything that Leachim would teach or say on three thirteen-inch platters called verbal discs. Into this “brain” he poured most of the contents of a children’s encyclopedia, the Guinness Book of World Records, a dictionary, a thesaurus, and a series of textbooks. The robot also knew some basic

<sup>29</sup> Training in the field of behavioural science, business and computer methodology, and the idea of robots as servants drove Dr. Michael Freeman to construct a teacher’s aide. The name of the robot, “*Leachim*”, was a rearrangement of his first name.

Spanish, what the words in the Pledge of Allegiance meant, some rules of chess, and a few snappy jokes. Stored in a separate memory system were the scholastic records of each of its students, their names, weak and strong subjects, and their hobbies. Once Leachim was plugged into the wall, he was programmed to be able to dip into each memory system and so provide a customized lesson for each child (Hoggett 2015).

Different aspects make this project appealing for our analysis, now in terms of its implementation. While the plan supported the teacher's action, we can see an interest in how the automaton was intended for customization of experience. As an instrument, it was an analog machine in need of the human: children had to push buttons and hold telephones to interact with the system within the robot, and someone external (Dr. Freeman) had to feed it with new information from time to time. Part of the reasons why the robot ceased to continue after three years of teaching was not because the authorities of New York, students or parents disapproved; but because it was "*time consuming. When the machine broke or had to be programmed with information on new children, only he could make the adjustments*" (Hoggett 2015).

As discussed in the introduction, the interest in the quest of artificial intelligence remains an important challenge for many to embrace. Dependencies of the bureaucratic system with an agenda must support the mechanistic ideal as it pushes beyond new remediations in favour of efficiency and production, contributing with it to a more complex relation of transparent mediums, most of them engaged in a new and sophisticated *reified experience*.

Today, automata designs do not care much about anthropocentrism in terms of its appearance, like the Leachim project, but acquire new shapes. This represents an important challenge since numerous limitations including public and environmental policies, economics, and human rights strive to cope with the speed of the latest systems e.g. *drone technology*, *cyber-surveillance* and implications of the *Internet of Things*<sup>30</sup> for instance. Most of these automata do not look human anymore. Nor are Massive Open Online Courses<sup>31</sup> with their promise of reaching a new level of ubiquity in comparison with

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<sup>30</sup> *Drone technology* refers to the latest unmanned vehicles, mostly air devices, able to function without human control. *Cyber-surveillance* is the access and monitoring carried out by external entities of private or non-private subjects performed in networked computers for their stored data. Finally, *Internet of Things* refers to the interconnected system of digital media able to give and receive data in order to perform customized tasks.

<sup>31</sup> According to (Pauschenwein 2012, 77), the Massive Open Online Courses (MOOCs) are a new model for learning, made out of digital mediums like Blogspots, online discussions, youtube videos, video and audio recordings from online meetings, among others. They are structured in a flexible way, something that allows them to be organized either in synchronic or asynchronic activities. Once available, these are meant for learners who are entitled to go through them with any intensity. Normally, MOOCs

traditional education and teaching:

...the continued development of the computer and the rise of remote and calculative technologies with their powers of simplification, manipulation and simulation, have been widely associated with the discrediting of the veracity of *theory* in the social sciences. [...] However, as Arendt argues, the mathematical shrinking of the globe to the scale of human senses results in a simultaneous distancing or increasing remoteness from the world. Half a century on from her prescient intervention, from drone pilots to cyber-humanitarians, one is struck by how *remoteness*, in all its modalities and nuances, has become a characteristic feature of our machine-defined social life and associated neoliberal modes of economic and security governance (Duffield 2015, 81).

When I announced programming as “*think as a machine would think if it could*”, it was clear that a human undertakes an exercise of reduction of his ideas down to isolated operative instances fit for a *golemic* instrument. But as remediation processes create new breaks in *actual experiences* while promising better conditions of certainty, a new generation of illiterate humans is discouraged from orienting themselves to the nearness of the realm of *actual experience*.

With such a scene, the new relation of humans to their automata celebrates more a “*systematic closure*”, an idea that Kittler (2004, 253) states critically as he affirms that “*computers shall hide more and more behind the inconspicuous facade of cars or washing machines; users shall be treated more and more like computers, that is, as programmable*”. Thus, some new medieval darkness threatens to separate the monkish elite of a few programmers from the billions of laypeople also known as computer illiterates. Their understanding of the machine is transparent.

Trusting the ‘surface’ of the bureaucratic system, most of us take for granted that the machine is there, and with it, the Internet; without bothering ourselves about the implications of the system. This conviction about our general interconnection may be questionable if we, for example, consider that in 2011 only a 60% of households in rural areas of the United States of America made use of broadband Internet services, (Severson 2011) and in a more global perspective, the latest International Telecommunication Union report disclosed that 40% of the world’s population make use of the Internet (ITU 2015), a higher percentage than the 38.1% (The World Bank 2014) reported.

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have a fixed web address and make use of wikis, blog, google sites, etc. In 2012, a New York Times article entitled “The Year of the MOOC”, highlighting other traditional characteristics: they are free of cost, accessible to anyone with an internet connection, independent of a central figure. “A full course made with you in mind.” (Pappano 2012) For a critical view on MOOCs and technology, I recommend Audrey Watters’ Hack Education. (Watters 2015).

Such percentages are only a single representation of various non-declared attributes that in the moment of their measurement, actively interact as part of a much more complex phenomenon. In it, the percentage number is an unclear reduction of unclear characteristics being drawn within a specific context. However, our responsibility when facing these measurements is to reflect further what else can be intended after such statements. Even in a most formal fashion, this is fundamental in terms of research, just as McCulloch (2004, 1) announces that “*to understand documents is to read between the lines of our material world. We need to comprehend the words themselves to follow the plot, the basic storyline. But we need to get between the lines, to analyze their meaning and their deeper purpose, to develop a study that is based on documents*”.

If 40% of our total earth population<sup>32</sup> were the only Internet users we have, this would only mean that more than half of humankind are not profiting from the possibilities intrinsic to the Internet, instead, they are cut off. Think of all these processes, initiatives and programs that are being strictly designed for online interfaces, which in terms of the universal declaration of Human Rights are initiatives threatening certain pillars of society mostly in pursuit of equality and accessibility.

Another way to read this percentage is to perceive it in terms of a worsening and increasingly unbalanced society. But among the 60% of lucky citizens in the “information society,” who are they exactly? To which social groups do they belong? What kind of life conditions do they experience? What possibilities are there for them to get access? Education should have a word about this subject.

The increasing speed of modern remediations in the realm of instruments has seen a new dawn with the computer, “*the universal solvent into which all differences of media dissolve into a pulsing stream of bits and bytes*,” (Lunenfeld 1999, 7). However, it is crucial to be reminded that all of these technologies, instruments of men, are reduced mimics of operations roused from the mystery of reflection. It is known however, that in its reduced set of operations, technologies have grown interconnected, a general framework containing high data rates increases; this possibility is stimulated under the light of the machine’s quantitative nature, a many-one mode with the highest efficiency possible.

Some preliminary manifestations of this scenario were foreseen with early machines; Postman and Barnett agree on basic notions linked to mediums such as the book, a manufactured object with conditioning characteristics for humans. For Postman, “*print means a slowed-down mind*”, different to electronics, always in need of a “*speeded-up mind*” (Postman 2011, 78). Barnett alike thinks of it framed in his analysis at academia; he reflects:

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32 The source states it is an approximate. The criteria and method used weren’t available

For the reading of a book represents certain kinds of time and space. The activity calls for some duration of time and characteristically – as in the phrase ‘reading a book’ – a slow pace of time. The book’s argument has to be comprehended, its nuances observed. But where is this activity to take place, if at all?  
(Barnett 2010, 72).

All the same, analyzing these artifacts and their influence on mankind tells of a rising amusement of new generations of people, most of them cherishing efficiency and speed instead of the message being carried. This feature is clear in the case of television where “*the excitement of a TV news show is largely a function of tempo, not substance. It is excitement about the movement of information, not its meaning*” (Postman 2011, 74). Bearing in mind these ideas, a term from sociologist Zygmunt Bauman becomes pertinent, specially because with it he explains the framework for society, more interested in *speed* and *lightness*, a »liquid modernity«. Jay (2010, 97) explains Bauman’s concept:

We now live in a world of precarious uncertainty, short-term planning, instant gratification, the weakening of institutions, ephemeral relationships, struggles to manage risk, volatile consumerist identities and the collapse of viable communities. Capitalism, once tied to the ground, seeking dominion over territories, is now light, unmoored to any one locality.

In an analysis of Bauman’s term, it relevant to note that he introduces his ideas after reminding us of a 19th century full of “*gaseous modernity*”. For this he highlights three important pieces within the western literate scene: “*A Sentimental Education*”, a novel written by Flaubert in 1869, about the adventure of a fallible hero escaping the haze of frantic metropolis; Charles Baudelaire’s autobiography where he contemplates “*the vaporization of the self*” and finally, Marshall Berman’s choice of Karl Marx’s Communist Manifesto to explain modern life: “*All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with his sober senses his real conditions of life, and his relations with his kind*” (Jay 2010, 96).

It is clear to us that Bauman’s analysis embraces a metaphor to explain a complex phenomenon, and to create necessary tension he adds a binary metaphor namely light/heavy. Once again, this position forces us to think of our society where only through the necessary reduction of materiality can we maintain the frantic movement of development.

The comparison is taken up by John Seely Brown (2015) when he describes a “*white water world*”, where we embark on a journey over moving, liquid matter. For it, he presents a comparison of



historical moments when different sailing methods could have been promoted in order to properly sail each of the contextual characteristics. Older generations in the last early century on the one hand, may have safely travelled with a steamship towards their future, while changing times for people during the '50s required lighter means such as sailboats. Yet, our current scenario better suits skillful kayakers in the middle of white waters. A body of white water takes this form after rapid streams of liquid falling, speeding up and spinning. However, this demanding role of sailors in today's world is seen by Brown as something positive, where plenty of combinations and possibilities are out there waiting to be imagined and worked out.

Furthermore, we could compare computing to the *mechanization of mental labour*. While it is acknowledged that this topic should not be reduced to solitary ideas, I stress a couple of hints the way Hannah Arendt did in "*Vita Activa*", a concept stated in her book *The Human Condition* (1998) described by Yar (2015) and Voice (2014). For this, she considered categories to help herself explain the meaning of being human.

Structured as a hierarchy, she declared three main concepts: "labour", "work" and "action". Arendt places *labour* as the key of the structure, through which we maintain life in the actual world that remains oppressor and we behave accordingly in natural harmony. Being the most basic of these categories, here we lack freedom and become *animal-laborans*.

Oppressed by our biological processes, e.g. eating, digesting, harvesting, reproducing, and because of necessity, e.g. chopping wood to light a fire and warm a place when it is cold, working in an office filling formulas to get money and pay the rent of an apartment; or teaching a boring class at a university, we are forced to perform ephemeral actions in order to endure, most of them worthless to construct or achieve anything more than the basics for life.

Here I claim, we can locate human's actual experience of a world of natural phenomena that urges us to react in order to prevail and it's undeniable as we perceive it through our senses. In this setting, we are close to all active animals that must perform as physical entities in order to live.

Secondly, she describes *work*, through which we create an objective world for enduring. Different to *labour*, in *work* men are able to manufacture objects and instruments, record songs or even build environments that last. As a result of *work*, we leave traces and trajectories<sup>33</sup> that make our world inhabitable and it itself is the *medium* that connects natures and humanity. In such a setting, men become 'Homo Faber'<sup>34</sup>.

<sup>33</sup> A human »trajectory« is a concept that I mention in terms of Wenger (2000, 154), not intended in the sense of "a fixed course or a fixed destination" in fact, a trajectory is more like "a continuous motion", just like 'Gesellen' address their exploration of the *experiential space* in front of them.

<sup>34</sup> A concept that is further developed in section 3.6.

What is important in this category is that Arendt locates here an *in-between* layer, where humans reify experiences and join a social mass in an objective world. It is space where the craftsman or the legislator are convivial. Between both, *labour* and *work*, *animal-laborans* and 'Homo Faber' we find a level of tension. One is naturally perishable, the other artificially prevailing.

For this, a third category is presented that unlike the previous two, reaches the state of freedom. *Action* stands for two crucial characteristics of being human: we are beings in possibility of total freedom, unique as we are. For her, *action* is fundamental because it reveals our true selves in front of others, by acting through speech, a performance that she calls "*the space of appearance*," (Voice 2014, 45), which is stressed here with a theatrical intention. At this level, whatever it is that we initiate is independent of something before or after, it is unpredictable. According to Yar (2015) there is a distinction between an initial *action* in terms of genuine or false behaviour. When the latter, our action is determined by a process making this event a product of conditional settings, therefore this cannot be contemplated as the kind of action Arendt refers to.

Henri Lefebvre (1901 – 1991) on the other hand, highlights terms such as 'production', 'product', 'work' and 'nature' to explain his idea of social space (Lefebvre 1992, 70). He argues that *a work*, different to *a product*, "*has something irreplaceable and unique about it*" whereas the latter results from reproduction. In this sense, *Nature* does not produce but creates. Creations of Nature are objects with which humans react. These actions can be understood as well as activities. Humans are also able to create but differently, we are able to produce likewise.

Given that in Arendt's critique the importance of our human life is ultimately to live it in freedom, while public and social, a big challenge arises when we are unable to overcome our vision beyond *animal-laborans*, as when we are unable to "*elevate beyond the repetitious and mute cycle of nature*" different from our state as *workers*, which "*gathers us into a common reality and shared objective space*" (Voice 2014, 40).

However, this means, as Voice continues, that our relation to nature in *work* is of a violent kind, breaking it and transforming it. This is one discussion to be aware of, because then we see Arendt's point about the circular approach of life as *animal-laborans* surviving under suppression and by necessity, there are also challenging consequences when our intervention as 'Homo Faber' becomes unstable.

Her critical view referred to the disruption when the "*lower mode of being comes to dominate society, cancelling out the virtues of the higher modes*" (Voice 2014, 41) and while she was specially critical against *labour*, with computation and the instrumentalist approach of the 'Homo Faber.' in our society we create an artificial society driven by predictability and automation of thinking to a large

extent.

This however represents a problem: as we apply mechanical constructions, that is, an artificial world through *work*, with the construction of the computing machine we have pushed the same character of ephemeral effort and irrelevance described by Arendt in *labour* to one of our most precious capacities that allow us elevate into *action*, that is, our mysterious and unpredictable possibility in reflection.

The mimicry of the operational model of our mind has evolved accordingly in terms of most of our technological instruments, and not only our physical body<sup>35</sup>, but our mental process becomes mechanized and equated to our animal muscles, hopeless and suppressed by natural phenomena. In this case, the society of consumption extends not only by those oppressed in their biological concreteness, but also now without bodies, in their mechanized minds. In this configuration, men could be compared to Capek's idea of "robota" while traveling by tram: machine-like people, *forced-labour* incapable of thinking.

Much the same as with the book, discussed by Postman (2011), during its rising and subsequent division of a society of literates and illiterates, with computers and their *algorithmic revolution* we reach a new break different to print technology, that develops extremely faster among initiated and not initiated.

My assertion is not against technology since I am not a Luddite in any sense, but to increase awareness of the importance about this break happening and how it is that a new level of understanding for the semiotic<sup>36</sup> field appears with the computer. The problem does not merely shrink to information, instead, we need to consider the trajectory of remediations to be able to recognize the significance to the meaning of humans in its dialectical tension with instruments, the concreteness of the *animal-laborans*, that elevates 'Homo Faber' and frees action.

It is important also to be aware of the semiotic world beyond the bureaucratic 'surface' of our computers. We should ask ourselves pointedly whether technologies will succeed in their aim to

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<sup>35</sup> Assuming McLuhan's premise "*media are extensions of man*", a trajectory of remediation processes is implicitly necessary to achieve productivity beyond our limited conditions. The latest instruments that concentrate on efficiency must continue paying attention to the immaterial control consummated through algorithmic technologies, a revolution that comes with a logic many-one: many processes running simultaneously and interconnected for one complex problem, an approach that would be impossible through the uncertain human process in reflection. Since time is crucial criteria to assess the success and pertinence of manufactured objects, the bureaucratic system requires less and lighter elements to achieve faster and broader conditions. The more the speed, the more the solidity of our bodies is unnecessary. Mechanical efforts concentrate on the mechanization of mental labour.

<sup>36</sup> According to John Deely (2010, 49) "*semiotics is the knowledge that arises from the study of the action of signs, called "semiosis."*

disembody us into mental beings of abstraction, invested purely with the process of information.

Differently, our human condition will remain necessarily physically shaped not necessarily as *animal-laborans*, but as »semiotic animals«<sup>37</sup>, therefore we are in need of the 'experiential space' that is only created with our bodies in combination with the semiotic field that mediates our knowledge of the world. The special kind of sign that rises from the computer is included in this formula. This relation is explained by Nake in the following way:

Their fantastic semiotic capabilities single out humans from the animal kingdom. Likewise, the computer is a special machine because of its fantastic semiotic capabilities. Semiotic animal and semiotic machine meet in reading the text that is usually called a program (Nake 2012, 82).

Historically, initiatives such as the »defamiliarization theory« have motivated people to inquire further upon conferred meanings of objects and signs, and thus exercise semantic values of our "common" signs. To achieve it, these known objects and signs were presented with alternative terms, it being one of the traditional exercises used under this approach.

Formally, the term was coined in 1917 by literary theorist Viktor Shklovsky (1893 - 1984), whose quest referred originally to fields such as art and literature, through which he explained the process of shifting semantic values to create new forms of our perceived world. As Crawford (1984) explains, the attempt of Shklovsky was to defend the endangered function of art -creation of perception-, against "*contemporary theories of the economy of the mental effort*" (Crawford 1984, 210) implied in times of automatization, something I have just presented in the discussion of *mechanization of mental labour*.

Then, the incipient mechanical device represented already a noticeable threat. Roughly 20 years later, the Turing machine<sup>38</sup> appeared and 60 years later, in 1977, the first successfully mass marketed personal computer went on the market ("Commodore PET" 2015). Was his warning valid? To discuss this almost 100 years after his theory considering a *semantic shift*, I write this thesis.

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37 "Now human beings are semiotic animals precisely because they are the only animals capable so of using signs as to be aware of that they are signs, which means to recognize that the material objects we perceive as signs are such not by reason of their subjectivity constitution but only by reason of their involvement in a triadic relation as standing in the foreground position of representing something other than themselves, something that they themselves are not." (Deely 2010, 49) In such sense, one of the main differences between animals and humans is that "all animals signify, many animals make symbols, but only human animals are capable of developing semiotics." (Deely 2010, 47)

38 A mathematical model of a hypothetical computing machine which can use a predefined set of rules to determine a result from a set of input variables. (Oxford Dictionary 2013)

## 3.4. DIVING BEYOND THE SURFACE / A SEMIOTIC MACHINE UPON US

If you are a computer, keep away from me  
For when me coming with my executor  
you going to roll into bombodee<sup>39</sup>.  
*Computer (Ferguson 2003)*

“Yes, I hate the computer”. Sitting in front of the ocean, where he has lived and sung his entire life, the most famous Costa Rican calypso singer talks about a song he wrote years ago, comparing the computer with a “*wicked talking parrot*” (The Tico Times 2006). In Cahuita, a little town hidden on the Caribbean coast of Costa Rica, this old storyteller used to perform bright guitar tunes that meandered between the bark of dogs and the scream of birds. Still mad at it, in a song entitled *Computer* he denounced an event when his little pension was taken away from him. After being approached, authorities claimed he was removed from the beneficiaries because a computing machine displayed certain information to his detriment.

This is why in his song, a threatening Ferguson points to the lying computer, the one telling authorities to go against him. Is the calypso singer that naïve? We will probably not be able to find out, but a tiny hint in his lyrics may suggest he is fully aware of the deceiving nature of computers if taken literally. A talking parrot is the metaphor. But looking closely, “parrot” is a verb that stands equally for an object that repeats *mechanically* (Oxford Dictionary 2013).

When thinking *mechanistic*, our view of the world is precisely conceptualized and categorized. Assuming this perspective, one aims for clarity. Information is sorted with known patterns, and this may create generalizations. This protocol enables human beings to deal with these phenomena in efficient ways. However, it does not prevent us from becoming divided.

Despite our scientific methods and facts about the world, we grow further separated by a breach, as standards aren't efficient to deal with organic environments, full of uncertainty and embracing failure as a possibility. At times, this gap becomes concrete such as in Ferguson's song, and there it becomes clear how it is that the *bureaucratic structure* prevails in aggressive control against the *organic structure*, blurred and uncertain, which ends up adapting under the filter of standards.

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<sup>39</sup> “Bombodee sounds like a somersault. It has no translation. It is a word Walter Ferguson used to hear a lot as a child in Cahuita, a small village that was isolated from the outside world until the 1980s. An old man used it to say ‘*Don't do that, you're going roll in bombodee*’.” (Ferguson 2003)

The world as a whole must be fragmented under the mechanistic belief. Artifacts appear to make this duty easier and by using them, we end up collecting pieces of the whole, where for the sake of standards, many of the “unstable” fragments are discarded for the sake of sharpness. Dahlbom and Mathiassen (1993,189) explain that “*as long as it is motivated by a technical interest or by a desire to understand, the most important facts about society will remain hidden. Thus, traditional science is really a form of political activity in defense of the established power structures. Only by choosing an emancipatory interest will our scientific research really aim at knowledge*”.

A hidden dimension exists, just like Edward T. Hall’s book in 1966, where he refers to a cultural dimension, almost entirely hidden for us to voluntarily perceive and hence control. It is a bold claim not just because his arguments were guided in terms of the individual experience but also because “*people cannot act or interact at all in any meaningful way except through the medium of culture*” (E. T. Hall 1966, 178).

His anthropological perspective, driven by *romantic* forces, cared deeply about the *experience of space*, stating that virtually everything we do and are is connected with it (E. T. Hall 1966, 171).

In Snow’s *Two Cultures*, he doesn’t target his critique towards any hidden dimension, but instead blames neglect. In the closing arguments of his book E. T. Hall (1966, 178) formulates a question. In his view the hidden dimension isn’t the major issue, but “*how long can man afford to consciously ignore his own dimension?*”

The premise for the upcoming sections is an open invitation to universities and digital media to venture beyond their stable platforms and set themselves off on numerous paths between. With the constant examination of the wandering that comes and goes, we may find new hints towards the immeasurable world of instances and contexts. It is in constant movement and reflection that we come to understand; along with the acting and constructing that go hand in hand. For it, we must rid ourselves of the compulsory craving for control without the aid of education strategies that offer methods and rational analysis.

Acknowledging that we meet a mechanical instrument at an early stage of its appearance, a problem with the transparency of the machine is inferred among foundational concepts of digital media. This challenge is not assisted as well when we consider that few references are available. As Sharples, Taylor, and Vavoula (2007, 222) indicate, “*just few educational thinkers have developed theory-based accounts of learning outside the classroom [...] but none has put the mobility of learners and learning as the focus of enquiry*”. Close approaches such as Mobile Learning (m-Learning), Ubiquitous Learning (u-Learning) and Seamless Learning have been presented within the last 10 years but again, significant issues are detected specially within three main trends highly valued in their

analyses while in deep conflict with my approach:

- (1) they are strongly biased in favour of technology development for users,
- (2) technology context awareness<sup>40</sup> is a principle and,
- (3)<sup>41</sup>the removal of teachers within educational scenarios is possible.

For me, a plausible way to tackle the learning process in times of digital media is possible in connection to a natural approach<sup>42</sup>, one that takes advantage of computing machines in their historical moment where humans meet coincidentally around them, voluntarily and driven by curiosity on the occasion of technological development.

In digital media we find the proper mediation channel to discuss fundamental topics of shared interest with higher education, thinking of the medium as “*that which appropriates the techniques, forms, and social significance of other media and attempts to rival or refashion them in the name of the real*” (J. David Bolter and Grusin 2000, 65). Without doubt the computer is one of the most exciting devices ever developed and according to Lunenfeld (1999, 3) what is more admirable is that it “*has colonized cultural production; a machine that was designed to crunch numbers has come to crunch everything from printing to music to photography to the cinema*”.

But as mentioned by Dahlbom and Mathiassen (1993, 18), bureaucratic procedures are in need of predictable environments to assure the certainty of results. In the light of this, instruments like computers are dramatically limited devices in need of precise indications to follow. They need abstract sequences of signs following specific syntaxes to operate in a predictable manner. In their limited way of language, the great advantage of computers is their enormous power when they process mechanically any sequence implemented in their system.

Yet, this mechanical characteristic becomes a centre of attention in the new instrument break. This trivial formalization makes a difference and exactly like the case before, as with any new artifact such as McLuhan's “teaching machine”, society split. There was a substantial difference this time, because instead of cutting illiterate citizens away from the system in order to force them into the only option available, the computer sign was of a special kind. It was flexible, perceivable for non-initiated but powerful and malleable for those granted with the awareness of a richer possibility that remains

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<sup>40</sup> It is my interest to develop an approach respectful of students' privacy, therefore low-based technology is required to avoid complex software in need of location-based data to function or adapt to users. This would mean that prescriptively, controlled information responds to human-situated learning. We refute this argument in this thesis.

<sup>41</sup> According to Milrad et al. (2013, 96), the aim of their proposal in Seamless Learning “is to design and enact not just episodic activities but also ongoing programs to gradually transform learners into more self-directed individuals able to carry out learning tasks not just anytime and anywhere, but perpetually and across contexts with and without external facilitations.”

<sup>42</sup> The natural learning approach is introduced in section 3.5.2.

transparent for most. It managed, as Dahlbom and Mathiassen (1993, 17) claim, to make “*formalization imperative less obvious even if it is still there*”. Greenberg explains it in the following way:

For nonprogrammers, code is a mysterious and intimidating construct that gets grouped into the category of things too complicated, geeky, or time-consuming to be worth learning. At the other extreme, for some professional programmers, code is seen only as a tool to solve a technical problem--certainly not a creative medium.

There is another path--a path perhaps harder to maneuver, but ultimately more rewarding than either the path of avoidance or detachment--a holistic "middle" way (Greenberg 2007, xxii).

I have mentioned in previous passages instruments with a 'surface' and a 'subface'. In the Muybridge & Stanford story schema (see p.64) two areas were already hinted at: one comprehends the scene where the concrete representation of a reified experience is met by an illiterate spectator. A second area is in the “back” of the representation, a sequence of fragmentation that normally is constructed through a technical process of the mechanical class and remains non-visible. The first area I claim is the “*user’s realm*”, where people strictly interact with the resulting representation of a specific sign pushed onto a »surface«. The latter, I suggest is “*the designer’s realm*”, where an initiated person is able to influence technical steps to create and/or modify the »subface«, thus any resulting representation is pushed onto the surface.

Before delving deeper into this dual relation, I want to briefly recount some aspects of our human condition when perceiving. Having studied some ideas of von Glasersfeld, it is illustrative to know that he uses the expression “*experiential interface*” (von Glasersfeld 1996, 93) to refer to the natural element that mediates between our mental procedures and the presumed ontological reality in the world, mostly in terms of ‘sensorimotor’<sup>43</sup> means.

Embracing this characteristic, it could be said that our ability to collect data and information in outer contexts is limited to our *experiential interface*, an element that ties indifferently to *actual* or *reified experiences*. Beginning in childhood we gather data and remember objects eventually to compare them and perceive change. Most of these layers of conceptual constructs will be blurry and inexact, a feature that can be explained -- says von Glasersfeld, using language as a central figure -- when we learn a new tongue and faced with a certain term, we will know what it means, but we won’t

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43 By »sensorimotor« I mean the biological possibility in humans to collect data and information throughout the senses and actions involving their physic and their nervous system.



be able to speak or write it. This feature exemplifies the possibility of recognition, but not the ability to re-present (ibid., 59). However, von Glasersfeld claims that these objects remain somewhere while they are not being called up as we perceive or re-present them, and this “*amorphous repository*” (ibid., 86) has been determined »proto-space«, “*a space that has as yet no structure and no metric, and serves merely as a repository for objects that one can re-present to oneself but is not attending to at the moment*” (von Glasersfeld 1996, 61).

The information kept in our *proto-space* becomes crucial for us because later, on the occasion of experiencing or re-presenting the same object, the act of comparing the *proto-spatial* unit with the one we are in the presence of, will lead to the construction of »proto-time« after noticing *change*. The process continues further and von Glasersfeld (1996,63) --taking Piagetian theory-- explains that what we have is a natural tendency to adaptive strategies that depend largely on this collection of experiences and concepts. Facing perturbances and having a second *frame* of an object in our *experiential interface*, we will be able to assimilate or disregard it -depending on whether it “*fits an experience into a conceptual structure it already has*” (ibid., p.62):

When I perceive, I would say I am registering signals that seem to come from my eyes, ears, and nose. When I re-present something to myself, it seems to come from another source, a source that feels as though it were wholly inside. Perhaps this difference springs largely from the experiential fact that when I perceive my percepts can be modified by my physical motion. The past I re-present to myself, in contrast, is not influenced by the way I move at present (von Glasersfeld 1996, 95)

Furthermore, to collect sensorimotor information does not mean that everything will be connected to actions of experience, but there can also be data and information of a conceptual kind, which in this case is connected to any formal system that results out of abstraction processes to produce symbols. Being thus, “*when we come to investigate this knowledge, the symbols are mostly linguistic. Therefore, semantic analysis, i.e., the analysis of meaning, has to be an important facet of any theory of knowing*” (von Glasersfeld 1996, 76). This means that these processes of interpretation in our human trajectory are largely pieces and signs, which elevate the importance of semiotics when we think of von Glasersfeld’s major principles in his Radical Constructivism model:

- knowledge is not passively received but built up by the cognizing subject;
  - the function of cognition is adaptive and serves the organization of the experiential world, not the discovery of ontological reality
- (von Glasersfeld 1996, 18)

Language and semiotics are fundamental elements to becoming human beings, social creatures able to construct knowledge. With these elements we grasp an external reality and become cognizant animals. Yet, it is important to keep in mind that they belong to the artificial world; they are instruments for humans just as computers and spaceships are.

Habermas for example, proposes “language” to be one of the mediation processes between subjects and objects. According to Frieder Nake (2008b,94) in his analysis on Habermas, to participate in a semiotic layer we meet with another, we relate to objects in three ways in *Mind (Geist)*. Through (1) *language*, we engage in a dialectic pattern of symbolic representation: an object is observed and after it, we track back to describe the state of it into the semiotic layer. Through (2) *tools*, humans relate to objects based on the dialectics of the labour process: an object is changed in order to make it fit the subject’s needs. Lastly, through (3) *family*, we become involved in dialectics of reciprocal interaction, where cooperative and reciprocal interaction is held between a subject that acknowledges the other as equal. As seen, the language category stands for the Geist process where we are able to represent symbols that are inspired in the presence or not, as von Glasersfeld clarifies, of objects.

On account of our individual process towards perceiving the world around us, elements such as language are crucial because as a system, these are sets of signs we can share and negotiate with among us. What we do when using words to communicate, is to share portions of units that stand for something that needs to be filled with each of our experiential context, one that varies strongly from person to person. An example is offered:

It is one thing to share a car, but quite a different thing, to share a bottle of wine. In the first case, two or more individuals are using one and the same car; in the second, none of the wine drunk by one person can be drunk by another. Sharing a meaning is a little like the second example, but not at all like the first. We cannot share our experience with others, we can only tell them about it, but in doing so, we use the words that we have associated with it. What others understand when we speak or write is necessarily in terms of the meanings their experience has led them to associate with the sound images of the particular words and their experience is never identical with ours (von Glasersfeld 1996, 48).

Based on this reflection, it can be said that signs such as words or drawn images are units that belong in their entirety to the individual who actively constructs them: it is a particular person going through a mental process hidden from everyone else, and strictly bound to the set of elements available in a proto-space, who offers a known sign that is part of a social system.

Through *language, tools* and *family*, Habermas sustains, humans establish a connection with objects to later participate within semiotic layers of representation among men. However, because of its special condition, it is considered that the *algorithmic sign* stands as a fourth scheme that enhances our experience of the computer as an object. Based on Nake (2008), we can ponder three different scenarios that, as with Habermas' categories, take place in the human mind (*Geist*) whenever we *interact* with objects. First of all, when being aware of (1) *the computer as an automaton*, the human intends a utilitarian purpose. In a low-complexity structure, we push the *algorithmic sign* into the computer. It obeys and computes accordingly to in return serve the human with *data output* after an expected operation. If we grasp (2) *the tool as the perspective*, a person assumes either a utilitarian or a ludic purpose. Facing a medium-complexity structure, this human logs the *algorithmic sign* in a semi-transparent software level (a semiotic layer) to request an interpretative action from the computer.

On this level, the computer obeys and computes data which is transformed into a show; the person gets in return an *aesthetic output*. Lastly, when making use of (3) *a semiotic machine* without awareness of its operations or its whereabouts, a user pursues a social integrative purpose. Immersed in a high-complexity structure, a person undertakes certain actions that are automatically interpreted as *algorithmic signs* by an opaque<sup>44</sup> software level (the semiotic layer) and later on are processed by a rich computer system. Here, the medium is highly sophisticated and tends to disappear thus creating an illusion of immediate experience upon the human being. A plethora of processes take place without trace or consciousness of the person involved, and automatically, *essential output* is offered in return. The need of a user is satisfied, however, conditioned by external formalizations.

Earlier, I indicated that one of the first lessons a Journeyman learns is related to his burden: the lighter he travels, the easier he can adapt to uncertainty and exigencies ahead. This romantic idea can be otherwise linked to remediation processes of artifacts: in order for mediums to be "healed", they must let go of unnecessary burdens to achieve efficiency and control. Ultimately, it means stripping the unreliable human's assistance.

This condition does not lead humans into despair. Analyzing our historical human, we may say that since mythical times we have always hoped for the algorithmic thing. The Golem story stands among one of such demonstrations of our natural tendency towards formalization and control. We went one step further and came up with the idea of robots, machines able to perform human tasks, many of which literally mimicked humans after anthropocentric shapes. The message was clear: when quantity

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<sup>44</sup> Here, opaque is interpreted as closed or hidden by Nake (2008) in its original idea. However, this argument should be understood to match Bolter's concept around transparent mediums, that is, non-visible for a user. In terms of McLuhan, these would be hot mediums.

and speed are the main criteria for fulfilling tasks in society, the manual approach of men must be remediated with mechanized and automated instruments. A large part of society may find this idea exciting, without caring much about any technical implications.

When such mindsets prevail in society, the bureaucratic structure can develop stronger; in the arms of computing machines for example. However these sorts of decisions are never neutral, because with the mechanistic success new challenges arise.

In the case of the algorithmic sign, it appeared as a medium to aid our perception of objects. However, it carried a double nature which leads objects to exist duplicated in the presence of the new sign. Humans come to know about this feature only if aware of this artifact in the middle. Now, in the presence of a semiotic machine, hardly anyone pays attention to the operations and the trade within. The purpose remains important enough, that is to be socially integrated.

A great challenge faces us if the position is against or in favour of computers, digital media, ICTs or technology. The *unfinished* aesthetic stands for a bigger metaphor that is wonderfully portrayed in the surface of the artifact. All the same, the power and thrill of the mediation process held in the computer remains incomplete if we come to believe solely on the spectacle that takes place there. A powerful sign is written necessarily in the *subface*. To reach these levels, humans must regain their interest not in the superficial critique, but in the »radical critique« in terms of Nike:

A radical critique requires us to take a phenomenon for what it is and for nothing else. As such, the phenomenon is admirable even if terrible. However, the radical critique is not a critique of superficial phenomena, and the critic must always go beyond the surface. Critique must try to reach the deeper and hidden levels of a process. Therefore, it takes time (Nike 2008a, 329).

*Going beyond the surface* is a metaphor that points at social processes, but in terms of the algorithmic sign highlights the importance of awareness of the mechanistic proceedings of artifacts such as machines. This engagement turns even more notorious for men whose professional actions are meant to lead others towards knowledge construction, this as we interpret the world around us. However, to be able to perceive the whole algorithmic sign, one must be able to speak the language of computers.

This is why our efforts should go into conceiving programming languages capable of being “*low floors*”, that is friendly enough to approach and get started; “*high ceilings*”, in the sense of robust enough to allow increasingly complex projects as people get more acquainted with the environment and lastly, “*wide-walls*” to support many different types of projects so people with many different

interests and learning styles can all become engaged; these are fundamental characteristics for Resnick et al. (2009, 63) based on his reflection on Seymour Papert's ideology. Many others, like Ira Greenberg find this approach to be necessary all the same:

To compile, in computer-speak, is to convert a (usually high-level) programming language into something lower level. Remember, a computer likes zeros and ones (the lowest-level language), but most people find it frustrating to communicate in binary code. It is easier to write programs in the same natural language we speak (the highest-level language), but a spoken language is extremely complex and would demand tons of processing to be able to interpret it. Therefore, in the design of a programming language, here is a trade-off between ease of use and performance (Greenberg 2007, 37).

It is true that sharing a language with the computer will get us nearer to the entirety of the algorithmic sign. However, what we do when programming is to think of the world only in terms of control and regularity. When using tools, it has been said, we look to change objects and predict results. But in the general picture, as Dahlbom and Mathiassen (1993, 186) indicate, "*the essence of methods, tools, and machines, of technology; is control. [...] We use technology to control the world.*" But if we were to accept that the world is not controllable nor regular, the algorithmic sign remains incomplete if it is not properly met by our human interpretation in constant change, in constant movement.

## 3.5. FOUNDATIONAL CONCEPTS TO REMEMBER IN THE EDUCATIONAL REALM

This is the paradox that challenges the teaching profession: we want all our students to learn the same thing, yet we want each to make it their own. (Laurillard 1993, 3)

Julian Germain is a photographer from Britain. In 2004, his daughter had her first day at school and while dropping her off, a long unremembered classroom was still there, just like the one he got to know as a child. Memories, traditional elements, and sequences of actions came to his mind, all evoked by one place. Noticing that “education” is somehow a forgotten subject within the visual arts, he thought of a project. In *Classrooms Portraits*, he documented images of the world, depicting groups of students in such an emblematic and important space (Fig.05).



Fig.05. Six classroom portraits, by Julian Germain, 2004. Up, from left to right: (a) a 3rd year secondary in Argentina, (b) Social Studies in Nigeria and (c) a first day at school in England. Bottom, from right to left: (d) an English class in Yemen (e) Religion class in Qatar and (f) in Cuba, a 3rd year secondary during a national television screening about the revolution. (Germain 2014)

Aiming always to remain neutral, the photographer’s interest was to “*make a straightforward record of the space and the pupils*” (Germain 2012, 6). Engaged in details, Germain’s method can be exemplified as a refined piece of visual anthropology. Using visual methods in Social Research, according to Banks (2001, 270), means that we can read a photograph and other media concentrating on the conversations among people, freeing what is shown beyond the artist and even the audience.

This is certainly achieved in these documents as a result of a systematic procedure to create such images. In *Classroom Portraits*, the camera is placed instead of the teacher, mimicking the existing scenario as if we were having eye-contact with those pupils. Interpreting this, we are transported in front of the students, while they patiently wait for something, tired; lacking the traditional joy of their age:

“I never tell the students how they should look [...] Each pupil has to be aware of their place in the picture. In order to achieve sharp focus in both fore- and background, the exposure time is usually a quarter or half second so the pupils have to be ready for the moment the shutter is released. I am waiting for them and they are waiting for me. The process itself generates atmosphere and the time captured in the portrait seems significant” (Germain 2012, 6).

The artist’s job here is to create some space for the other subjects to find a place in front of the camera. With this gesture he does not seek to control, but to allow natural phenomena to happen, thus be represented in a rich way. The spectator will finish the sign afterwards as interpretations emerge, the same way we are doing it now. But changing slightly our perspective, the way of the artist is shared to a large extent by the scientists’ view, in the effort conducted by ethnographers whenever they describe detailed pictures of the human being “*within its setting, explores themes or issues that develop over time as the group interacts, and details a portrait of the group*” (Creswell 2011, 21).

Social scientists analyze and interpret a cultural group, describing deeply an object of study. But this process is shared by the artist, at times explicitly indicating an argument yet more often freeing space for others to play with their interpretation processes. In Germain’s case, the repetitive method behind each image seems to be necessary. It creates accents without disturbing the collection of statements hidden in each composition. This is what the visual sociologist pursues, and like him, the artist satisfies the “*dual perspective*” mentioned by Banks (2001, 38), as he attends to content and meanings attributable to certain elements, but also studies the context around it:

The way pupils dress for school says something about their society, as do the pictures or notices on the walls (or lack of them). [...] The images confirm that the basic classroom model is always the same wherever you are in the world but also reveal the incredible variety within that space (Germain 2012, 7).

In the previous chapter we discussed that to apprehend the completeness of the *algorithmic sign* we must go “beyond the surface”. While this metaphor is non-exclusive for our debate on algorithmic signs, it should be understood as a reminder to transcend knowledge and reflection beyond

information, a construct that is achievable in the presence of rich signs to trigger plentiful meanings. Complementary to this idea we should consider Banks (2001, 10) reflections on Terence Wright, where three different ways are presented to properly read visual signs (in the example offered by Banks, he talks of photographs), “*looking through, looking at, and looking behind*”.

In such expression, Banks thinks of a multilayered instance with depth (through), broadness (at) with a front and a back (behind). Similar, Jean Lave’s conceives knowledge and learning as something that takes place within social relations where “*we look at each through the other, with respect to the other*” (Lave 2012b) always in a dialectical way. Both arguments match the metaphor’s intention in *transcending a surface* to be able to access signs of limitless meanings.

Additionally, we have studied certain theoretical perspectives to comprehend key characteristics of *digital media*. Prominently, we have analyzed the computer and the algorithmic sign. Such mediums are examples of manufactured objects, successful cases which grew nested in the old custom of problem-solving by fragmentation. This method may be associated with Cartesian ideas, fixed on ways to sharply describe a world of absolute instances. Framed inside bureaucratic structures, these mediums are fundamental to sustain a society that is structured in terms of prediction and control.

These reflections serve a greater purpose as they are vital to better understand the *space of learning*. In its special relation with formal education, digital media plays an active role in the construction of these spaces. Nonetheless, this involvement is diminished by our tradition of superimposing disciplinary concepts whenever multiple fields are needed to explore a problem; two *Ivory Towers looking at each other*, but never *through the other with respect to the other*, following Lave’s deliberation. This is not different for the meeting of digital media and education towards spaces of learning, a condition that must be improved in order to discern all the new implications emerging among shared concepts. Until then, an unclear state of crammed components ends up roiling the learning process.

For this, we need to move on with other theoretical perspectives to shape our perception of *higher education*, our second field of interest where a kind of learning is constructed. In its traditional understanding, it is presented as a bureaucratic mechanism that enhances development. In fact, human development is recognized measurable in terms of how “educated” and to what extent a subject “*enjoys a decent standard of living*” (United Nations Development Programme 1997, 15).

Furthermore, the extended concept of higher education is tied to traditional institutions such as universities, places where a classroom is typically found. Either as seminars, lectures, workshops or classes, actions take place following time grids, where study programs lead to degrees that are granted strictly in exchange for credit units. But precisely there, as explained by Laurillard (1993), the dialectic



challenge surfaces despite this analytic nature, universities get hold of the organic idea of learning restrained by bureaucratic *standards*.

This interpretation may be agreed in the light of extended consensus, where education is promoted as the *mechanism* that “empowers” people in acquiring necessary competencies to become *active agents of society*, which to my mind is an arrangement that obeys no prediction or standards, it is instead sensually and socially experienced. This conflicted characteristic is to be found among those bureaucrats at higher education structures, who support the idea of individuals free of coercion, enabled to satisfy their personal and specific humanistic aspirations, by following a predictable structure.

I intend to further focus on specific contexts within a region of the world, namely Latin America. There, the idea of education envisaged in times of digital media<sup>45</sup> can be fairly portrayed in the report offered by OREALC/UNESCO Santiago (2014). It emphasizes the running discussion of ICTs as strategies in education allowing the conflicted dualism to emerge all the same.

On the one hand, the institutionalized position of their report aspires to raise attention to the needs that allow people in the region to acquire what they associate with competencies: e.g. critical thinking, creativity and autonomy. However, they still see big challenges preventing a “transformation” from happening. They bring in ICTs following an unclear potential: at times creating tension and uncertainty, yet they identify a promising scenario when certain conditions are met (OREALC/UNESCO Santiago 2014, 17). For me, this is one of the concrete symptoms of a lack of clarity of shared concepts, forced under the competing conditions among fragmented terms being crammed in. Later on, the authors come to mention what for me is the key point of our discussion:

“The school as a formal space of subjects, classrooms, and time / spaces of teaching and learning need to be transformed in order to be more permeable and dynamic. Cultures within the knowledge society force us to be open enough to think of

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<sup>45</sup> In the traditional academic scene, digital media could be addressed as part of the term Information and Communication Technologies (ICT), in fact, official lines within the educational sector in Latin America stick to the use of this term (notice for example the title of OREAL/UNESCO report in 2014: Strategic approaches on ICTs in Latin American and Caribbean education). The term is impoverished and biased, unable to host discussions around complex debates related to the algorithmic revolution. In fact, England’s Royal Society has manifested strong discontent in one of their 2012 reports around this issue. They point at the necessity of pertinent terminology, acknowledging among their main findings that “a word is needed on terminology. In this report, the term ‘Computing’ is used with a very broad sense. Computing is concerned both with computers and computer systems – how they work and how they are designed, constructed, and used – and with the underlying science of information and computation.” (The Royal Society 2012, 5) They discriminate ICT from Computing, specially because it is not pointing at elements like programming, digital literacy, algorithms, information technology or computer science, hence “the term ‘ICT’ should no longer be used as it has attracted too many negative connotations.” (The Royal Society 2012, 8) I support their analysis.

education differently. Rethinking the architecture of the school, the learning space (which can exist with different types of virtuality) and power in the distribution of knowledge“ (OREALC/UNESCO Santiago 2014, 19 own translation<sup>46</sup>).

The artist who curious portrays classrooms of pupils around the world seems to be fully aware of the intricate set of relations behind each image in his collection. He stands for the romantic approach, for the organic structure. For the humanistic belief. His curiosity originally emerged because he wanted to visualize education and in the process, his interpretation appeared slowly, one classroom at a time. In his words, I find a fair representation of the same message I offer in this document. As he reflects on the absence of adults in his images, his explanation indicates that their (our!) presence is undeniable.

I realize there is a complete absence of adults within these pages, despite the fact that it is teachers, parents, politicians, academics tax payers, “us” (and previous generations) who have shaped the world these young are in. Adults have literally designed and built the classrooms, made their books, bags and clothes. The influence of adults runs throughout this book. Ours is the hidden hand behind every one of the pictures (Germain 2012, 7).

### 3.5.1. Multivalence in Higher Education

*Development* is a concept that as soon as it is affiliated to *education*, opens up peculiar reflections that may allow us clarify their meanings. This happens because ingrained in each of the terms, two different worldviews exist and by understanding them in connection with each other, we are performing a dynamic exercise based on dialectics. Moreover, it is useful to notice that both concepts are primarily manufactured objects of known structures that are there to satisfy certain needs. For me, this is the definition of »systems« offered by Dahlbom and Mathiassen (1993).

Accordingly, with their extended explanation on mechanistic and romantic approaches of the world, they speak of »systems development« as the “*business of constructing computer systems for the use of human beings in receiving, processing, storing, and communicating information*”. Since *development* and *education* are so far understood as systems of computable nature, I will make use of three different categories offered by the authors on system developments: *hard-system thinking*, *soft-system thinking* and *dialectical-system thinking*. However, it is important to be aware that, by merely thinking of the

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<sup>46</sup> La escuela como espacio formal de educación con sus asignaturas, aulas, y espacios/tiempos de enseñanza y aprendizaje requieren ser transformados para ser más permeables y dinámicos. La(s) cultura(s) de la sociedad del conocimiento obliga(n) a tener la apertura necesaria para pensar de manera distinta la educación. Repensar la arquitectura de la escuela, el espacio de aprendizaje (que puede ser con distintas modalidades de virtualidad), el poder en la distribución del conocimiento.

world in terms of such systems, we are consenting to embrace the hard system approach, imposing concepts related to phenomena happening out there, in the world (Dahlbom and Mathiassen 1993, 53).

On the one hand, it is known that an influential entity such as the United Nations states its vision of human development in terms of *how* educated someone is. This vision, in spite of the obedience it professes towards standards, is in a certain way humanistic, still interested in taking care of individual belief and experience. In this case, the United Nation's stance may be taken as an example of *soft system thinking*. They are known because they construct the world in presence of perspectives, seeing design as learning. "*In the soft-systems approach, design is seen as learning. We start with an unstructured situation and end up with requirements for a change*" (Dahlbom and Mathiassen 1993, 58) but still as the authors show, the soft-system thinker has no certainty of how to satisfy the set of clearly listed requirements .

Others see it very differently. Ricardo Hausmann<sup>47</sup> recently published in a Costa Rican newspaper "The Education Myth" (Hausmann 2015). To construct the argument, he offered comparative statistics of relevance for economic and educational public sectors. Without mentioning his sources, he affirms that from 1960 until 2010 the schooling average for the labour force worldwide was tripled from 2.8 to 8.3 years; in addition, he mentions that in 1965, the labor force in France that spent less than five years in school earned \$14,000 per capita (comparable to prices in 2005), while in 2010, the labor force in different countries (he doesn't mention which) with the same amount of schooling years, were earning less than \$1000 per capita. For him, *economic development* is carefully described in terms of quantitative approaches, and it happens in terms of *production and earnings*. The more production, the more development a country will have in its benefit.

His position is critical about education as the key for economic development. The key to increasing production is not educational strategy, for him the numbers demonstrate facts. Hausmann's analytical position is shared by many, which is the traditional view of a *hard-system thinker*. They think of a "*functional system, a machine with a determinate function. Our method of understanding relies on taking the mechanism apart to see how it works*" (Dahlbom and Mathiassen 1993, 49). The hard-system thinker is always in danger of getting confused in his quest for the "*true representation of the world*", defending at some point their representation as "*the true one*" (ibid., 52).

Lastly, certain people have trouble understanding or believing what is meant with the word *development*. In contrast, they know of many other threats that are not being rightfully addressed, and

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<sup>47</sup> Ricardo Hausmann is Venezuela's former minister of Planification and current director of the Center for International Development at John F. Kennedy School of Government at Harvard University. His background is economist.

instead the focus is given to the “*primacy of utilitarian thinking*” and granting “*absolute status*” to the “*beneficent effects of economic growth*” (KHK / GCR21 2014, 6). Next to education, they see the importance of learning “*how to devise a more lasting relationship with nature, and with culture*” (ibid., 29). They see a state of post-development, a time when humanity has surpassed wealth in all possible fields, to the point that it is not sustainable anymore.

For them, development is better explained in terms of the debate being raised by the ‘de-growth movement’, the ‘slow food’, ‘slow town’ and ‘slow science’ movements as some of the instances actively organized.<sup>48</sup> They are *dialectical thinkers*. They are known because they construct the world using contradictions, seeing that “*you can no longer rest content with choosing between a hard and a soft approach to systems thinking. The observation is that life is a struggle*” (Dahlbom and Mathiassen 1993, 24), seeing design as learning (ibid., 62). For them, design is *action*, the last level where according to Arendt (see p.82) humans reach freedom in its complete form.

Setting aside their different perspectives: the United Nations with its vision of *human development* depending on education; Ricardo Hausmann in his plea of rethinking *economic development* away from education; all of us wondering about the notion of *development* trying to stay away from the mainstream of political thinking, or even a teacher in front of a group of students inside a classroom; in all cases we are *system developers*. We actively produce, acquire and keep track of lots of information to sort it in a way that others may take decisions with their fabricated systems (Dahlbom and Mathiassen 1993, 24).

In common practice all these approaches come mixed as information systems that do not respond to one single approximation and as with higher education, they are multivalent entities in need of different designs. For all this we are in need of finding a meeting point somewhere in the great valley that gets extended between the *Ivory Towers*, which to my mind is feasible by adopting a dialectical approach where the ‘lively space’ of *change* and *contrast* is the potential vehicle for both hard and soft thinkers.

Evidence throughout history speaks of altering meanings and the importance of context. In Peter Weibel’s (2006, 6) narration, we learn about Aristotle’s days, of the time when “*Te/xnh (téchne)*” and “*e)pisth/mh (epistéme)*” were radically differentiated<sup>49</sup>. In the first case, the philosopher referred to it

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<sup>48</sup> The Slow Science Manifesto (Slow Science Academy 2010), was made in Berlin, Germany. It states a clear message concerning the academy sector and the speed under which processes take place. In their text, available online, they start by saying “*We are scientists. We don’t blog. We don’t twitter. We take our time.*” and close their arguments by stressing once again time as one of the issues to tackle. “*Bear with us, while we think.*” There are other multiple different movements in connection with the concept of Slow Education, for example <http://www.contemplativemind.org/about/vision>

<sup>49</sup> Both concepts were presented in Aristotle’s *Nicomachean Ethics*, -the same work where he presented his understanding of

as *practical capabilities and art* (e.g. architecture, painting and sculpture), a *practical knowledge* that was meant for servants, wage labourers and craftsmen.

Different was the idea of *epistème*, for him *cognition and knowledge*, which was reserved for the community of free citizens, those who were an active part of political life. *Epistème* had different sciences (*epistèmes*): rhetoric, arithmetic, geometry, astronomy, dialectics, grammar and music theory. For Aristotle it was clear that crafts and manual work were a burden, a sort of limited slavery. Moreover, manual work produced a bad physical complexion and it was a distraction from the free exercise of contemplation by virtue of soul and reason, fundamental to political life.

His idea however, was not to criticize the existence of *téchne*, but to indicate it was inferior to *epistème*, always at its service. Notwithstanding in 1500, architecture, painting and sculpture went from *téchne* to liberal arts. Weibel makes use of this historical background to explain the difference between traditional arts and digital art nowadays, explaining that because of the use of artifacts and technical reproductions, digital artists are the new inferior craftsmen doing mechanical arts, while painters and traditional artists are considered part of the liberal arts, superior while making use of anthropomorphic principles.

Painting was the underdog in Aristotle's epoch, standing on top of digital approaches. The analog art made by the artist's hand, one stroke at a time, belongs today to the high classes of society. The labour class holds reproductions, photos, editions and postcards. The medium becomes the message, a big statement for those who consider mankind's tools to be neutral.

But how is it that we come to learn anything? This simple question embodies an invitation to look into historical lessons, multiple perspectives and numerous attempts within social structures. Let us think for example of the maxim "learning by doing" stated by Aristotle<sup>50</sup> centuries ago. While it surely remains an inspiring indication that gives rise to sets of conjectures and strategies to influence certain learning processes, most of them come up short if they intend seriously to explore the intricacy of Aristotle's ideas.

Think of the following fragment, "*we become just by doing just acts*" (Aristotle 1984, 1783). Implicitly, Aristotle tells us that our active presence (e.g. breathing or eating) as we dwell in the world

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*learning by doing*. Later on, the romans promoted them as *mechanical arts (téchne)* and *liberal arts (epistème)*.

<sup>50</sup> According to Michael Knoll (2011), the concept of *learning by doing* which is traditionally linked to John Dewey, Bertha von Marenholtz-Bülow or even Friedrich Fröbel, is to be found in times of Aristotle. It is indicated that in his 350 B.C.E. work "*Nicomachean Ethics*", volume II, he coins the idea expressing the following: "*For the things we have to learn before we can do, we learn by doing, e.g. men become builders by building and lyre-players by playing the lyre; so too we become just by doing just acts, temperate by doing temperate acts, brave by doing brave acts.*" (Aristotle 1984, 1743)

is enough to become<sup>51</sup>, which in his words is presented exactly as in the relation to learning, necessarily before doing. Moreover, for the sake of my study, I propose in section 4.3 “*Learning by wandering*”, which is an approach for analyzing the space of learning in higher education by paying special attention to space as a central phenomenon.

All in all, learning takes place throughout life, and the multivalent character of higher education embraces artificially what happens naturally. If we adopt this premise, we can declare certain conditions right away to explore our construction of the concept of education and most specifically, higher education. What we do at universities when we teach, is to conduct a manufactured process. At length we pursue to promote learning among those people who agree to undertake processes within the bureaucratic structure offered.

All of these actants, people teaching and people to be taught, come together forcefully because they must do this in order to access certain social structures. However, learning is a natural process that comes inherent to living. I cannot insist enough on this great difference: learning isn't teaching and in fact, learning happens without teaching (Lave 1996, 151). When we teach, we perform under artificial premises to change an object, which in the light of our discussion is most of the time another human being.

In Habermas's terms, teaching consequently becomes a tool because we use it to change (educate) a person. When we use tools to change objects, we act according to the dialectics of the labour process and what we do when teaching is to fit a person to the needs of the educator, who in this role should not be conceived as an individual but as a representative of the social structure. The un-educated come in necessity of being shaped, of being initiated. This has been taught to all in different ways and becomes the requirement if we want to benefit from “a decent standard of living”.

The natural way of learning should be the starting point under any educational attempt. In its present configuration, artificial structures like higher education are reported to evidence uncertainty often, as soon as digital media is introduced. Some authors observe it as a “*new type of learning*,” which I would reinterpret as the *latest effort in the everlasting struggle of natural (learning) against its commodification*:

This new type of learning is a cultural phenomenon that underlies a large number of people's experiences and affects them in myriad ways. It takes place without books, without teachers, and without classrooms, and it requires environments that are bound yet provide complete freedom of action within those boundaries  
(Thomas and Brown 2011, 18).

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51 Becoming is a fundamental term for Barnett and Thomas & Brown.

*Higher education*, on the one hand, is a bureaucratic configuration and like most of its kind, “*the Achilles heel of a bureaucracy is its inability to respond effectively to change*” (Dahlbom and Mathiassen 1993, 18). This issue is depicted in Julian Germain’s photographs. For eight straight years, 450 classroom portraits demonstrate that the standard arrangement persists: few or more fixtures and garments, without changing significantly, throughout cultures, for decades of history. In its bureaucratic shape, this arrangement pursues stability which is fundamental for any information system, but, to what extent is learning happening there? *Learning as a natural phenomenon*, unavoidable for us, happening since our first breath of life, is confronted with a formal, stable structure. In order to fulfill alien standards, our natural impulse in learning must adapt to an outer control, a mandate, for the promise of development and higher living standards. Digital media on the other hand, another bureaucratic fabrication, continues evolving under new remediations, flexible, quicker, mobile and pervasive.

Under such circumstances, an uneven relation seems to favour some level of conflict between both bureaucrats, often when both coexist in the space of learning: university teaching, an “old medium” up against digital media, flexible and sensitive to changes. Is this perhaps the right moment to think of new teacher-less configurations within education? This would be highly questionable when we study certain cases in Latin America, where studies show that teachers are recognized to be the second major factor of influence for positive results at schools (OREALC/UNESCO Santiago 2014, 19). Perhaps instead, it would make sense to think in terms of Gert Biesta (2013, 45), “*teachers should teach, that they should be allowed to teach, and that they should have—and perhaps regain—the courage to teach*”.

Biesta for instance, warns us of the “erosion of a certain understanding of teaching and the teacher” (Biesta 2013, 35) in the presence of an agenda that promotes control as a primary goal, where students learn something with a purpose from someone, instead of just simply learn. In his pursuit, Biesta tries to reconsider the basics of teaching, and for this he recognizes the intrinsic nature of teaching in terms of «telos», that is, the purposeful action in any educational activity.

In this sense, the author highlights the “maieutic conception of teaching”, remembering Socrates’ reflection on learning as something that has to do with “recollection” (Biesta 2013, 40). Later on, he stresses his view of teaching as something which isn’t limited to “collect” what is there and is known, but something “radically new” (ibid., 41). Biesta, recognizes teaching in terms of offering a “gift”, one that emerges based on the judgment of a teacher beyond *téchne* towards «phronesis»<sup>52</sup>, here explained

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<sup>52</sup> *Phronesis* is an important concept in this thesis, associated to the role of educators within the *space of learning* at universities. According to (Flyvbjerg 2001, 2), “*Phronesis* goes beyond both analytical, scientific knowledge (*episteme*) and

as “practical wisdom which is not a skill or competence -- and even less a matter of scientific evidence -- but a quality or ‘excellence’ that permeates and characterizes the whole person, [...] such wisdom comes with age or better: that it comes with experience and more specifically that it comes with the experience of engaging oneself in the exercise of such judgments” (Biesta 2012, 45).

A ‘Geschenk’ [gift] is precisely what the ‘Geselle’ obtains from his guild once he begins his journey. Not constrained by it, it is a relevant currency to undertake different enterprises during his journey and be safe if there is some danger or menacing event threatening his exploration:

Learning cannot be designed. Ultimately, it belongs to the realm of experience and practice. It follows the negotiation of meaning; it moves on its own terms. It slips through the cracks; it creates its own cracks. Learning happens, design or not design (Wenger 2000, 225).

Higher education in the »post-media condition« must become the keeper of waiting. *Post-media*, a term discussed by Peter Weibel, originally meant for arts and media, stands as an approximation of our current social condition, where there is no dominant but interacting media, a state where all mediums condition each other. This collection of elements merges into one universal medium able to understand itself and allows the emancipation of spectators, visitors and users.

In the post-media state everyone experiences equal rights, lay public, amateurs, philistines, slaves and servants. It stands for a new democratic art in which anyone can take part. The participation platform is the Internet, where anyone can upload pictures and/or videos. For the first time in history there is an ‘institution’, a ‘space’, a ‘place’ where the lay public help themselves with media art in order to offer their works to others without the control imposed by critique (Weibel, 2006, 15 *own translation*).<sup>53</sup>

The significance of the spatial aspect can be seen in the vision Neil Gershenfeld has in connection

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technical knowledge or know-how (*techne*) and involves judgments and decisions made in the manner of a virtuoso social and political actor. I argue that *phronesis* is commonly involved in social practice, and that therefore attempts to reduce social science and theory either to *episteme* or *techne*, or to comprehend them in those terms, are misguided.

<sup>53</sup> “Por todo ello debe definirse esta situación de la actual práctica artística como condición postmedia, porque ya no es solamente un medio aislado el que domina, sino que los medios interactúan y se condicionan mutuamente. El caudal de todos los medios forma un medio universal que se comprende a sí mismo. [...] esto provoca la emancipación del espectador, del visitante, del usuario. En el estado postmedial experimentamos la igualdad de derechos de los profanos, de los aficionados, de los consumidores, de los receptores, de los banausos, de los esclavos o de los siervos. [...] un nuevo arte democrático en el que cualquiera puede participar. La plataforma para esta participación es la red. Allí puede cada uno colgar sus fotos y sus vídeos. Por primera vez en historia hay una “institución”, un “espacio”, un “lugar” donde los profanos con ayuda del media art pueden ofrecer sus obras a los demás sin el control de la crítica. Hasta ahora se censuraba.”



with the »makers movement.«<sup>54</sup> For him, the major problem in education is related to *mentoring*, specially in the accompanying actions necessary to take students from point 'a' to point 'x', this because mentors around the world (following the model of Fab Labs) did not have proper preparation for whatever challenges they were about to face.

For this, he calls attention to "scarcity" as a key element, aware of what is needed for basic conditions to move forward into learning. However, no matter how much of an effort he and his team performed, there will always be more people unable to access these opportunities during their trajectories of learning. That is why the Fab Academy was created, following a principle close to how the Internet works, but different to MOOCs because they are not interested in centralizing their actions, but working as a "mainframe" with "plugged terminals" wherever. "Students have peers in workgroups, with mentors, surrounded by machines in labs locally".

What they do afterwards is to connect them making use of all different possibilities available, benefitting from the post-media condition. Gershenfeld describes it as "an educational network" where all these "critical masses" go from local to global. If this is the approach on education that I present, what becomes helpful here is the principle, something he defines as "now instead of just teaching at MIT we're teaching using the whole planet as the campus".

A final and central question remains open in the midst of current automata developments, in the course of being accompanied and getting extended in our human capabilities throughout most of our everyday activities. Because this state of affairs makes us aware, overshadowed by time, of our spatial dimension, the crucial element in the realm of the mechanistic. But since both, time and space are not to be separated, a term that indicates the importance of space in time is presented by Barnett as "spacious time" (Barnett 2010, 76) based on questioning the understanding of time as a resource, and like all resources since the Palaeolithic times, they must be accounted for. The author openly questions, "*is thinking time to be accounted. Is reading time to be accounted?*" (Barnett 2010, 75)

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54 Next to the rise of *digital communication* and *digital computation* back in the '50s, the makers movement should be associated with the rise of *digital fabrication* at that time. According to Gershenfeld (Edge 2015) it began when the first machines used to *fabricate* material objects began to be controlled numerically. It acquires in our days much attention specially with the appearance of personal computers and highest-level languages, thus making programming accessible to people in their potential to fabricate infinite elements by using the algorithmic approach. New emergent initiatives nowadays promote the creation of such knowledge, supporting people in various ways: open spaces to work and learn together (Fab Labs), workshops, publications / tutorials "Do It Yourself" (DIY) and the Open Source Software. The spirit is to grant free access to this information, but also to teaching and training in the use of all kind of programming languages and technologies like lasers, supersonic jets of water, EDM with wires, machining, plasmas, fusing and bonding. However, Gershenfeld mentions that we tend to miss the point if we focus attention on isolated elements like 3D Printers, because, digital fabrication is not complete as phenomenon with the analog. "*The design is digital, but the process is smoothing material.*"

Moreover, I add one more doubt: *is learning something to be accounted for?* The question turns of radical importance because as we step back to adopt a new focus, the concept of *space* appears prominently as the alternative with which to start describing learning. Different to a sequenced process of known circumstances, in space we must think in terms of the human experience. Aided by authors and their perspectives, in the upcoming arguments I will knit the relations that remain loose, yet are useful to construct bridges between teaching and learning in times of digital media, framing our effort around the natural aspect of learning, the starting point of any educational attempt.

### 3.5.2. The learning perspective

To reflect on higher education, it is necessary to grow in awareness of the essence of *learning*, specially if we think of it as a natural phenomenon that transpires as we undergo life. Among the important clarifications we must keep in mind, is the proper differentiation of it from *teaching*, leave alone *training or instructing*<sup>55</sup>, *where we come up with artificial formalizations that are configured to influence other individual's learning. Traditionally, we speak of these information systems in terms of success and efficiency, this by considering certain criteria.*

However, many of the standards are easily questioned specially if we think of them as means to transform unenlightened people (von Hentig 1972) into fruitful members of society; an uncertain distinction that seems to be highly unpredictable as we discriminate between initiated and non-initiated ones (Schmandt-Besserat 1997, 93). On top of the that, the presence of computing machines in the space of learning challenges the traditional configuration of these organizations, most of which seem to be disturbed in the steadiness of their formalizations, hence jeopardizing the learning sequences in higher education.

When we think of organic structures, we can match the nature of learning, but as explained before, with the computer being part of the formula we gain the chance to process information in formal and efficient ways, which is considered its fundamental strength (Dahlbom and Mathiassen 1993, 21). This is worthless however. It seems that with this advantage we are still unable to gain some time and with it, be more reflective towards the construction of more knowledge. In such terms, it seems that we are still in need of serious efforts to think of learning spaces away from the computer and beyond the computer.

Schank (1995) explains that people, as natural learners, "*learn from everything they do*". For him, learning is about accumulating and indexing cases that are considered in the presence of old ones.

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<sup>55</sup> According to Marsick and Volpe (1999, 2) training "has been viewed in terms of discrete planned events (experiences) used to instruct people how to perform specific defined jobs."

These operations, acknowledged as well by von Glasersfeld to explain the act of reflection in humans, allow us to decide and perform about a new case which in short, it is closely related to recollecting, previously explained in the *maieutic* sense of teaching.

To trace the origins behind the concept of *natural learning*, one must return to when influential thinkers advocated historically for the humanist approach strongly related to Plato's practical knowledge, immersed into unclarity; or to Rousseau's natural education to be found in *Émile*, a work of relevance for the pedagogical approach as a life effort, published in 1763. Nevertheless what needs to be noticed, is that in most of their perspectives one is able to identify elements connected to the "*Bildung*" concept, the cultivation of man through the harmonic relation between the private and the public which is at all times connected to the confines of organic structures. It is under these circumstances that Ernst von Glasersfeld's *Radical Constructivism* was partially introduced in section 3.2, to explain some basic notions about human perception.

Among the possible instances, I want to begin with an example that comprises both the idea of *learning by living* assisted by an *educational structure* aware of this claim. For it, Harmut von Hentig - a known German progressive educator- proposes a series of reflections on "*the useful experience of being of service*" (Hentig 2006), and there, he suggests ways for improved youth integration into society, given the increasing state of violence in society and what von Hentig interprets as a deterioration of the social processes in his context.

For this, he emphasizes "*service learning*" as the possibility; a teaching method in Germany that different from correctional strategies like *community service*, fosters the active participation of minors within given needs present in their communities (Brunold and Ohlmeier 2012, 106). Out of a list of possible scenarios of *service learning*, von Hentig makes use of one practical metaphor known in his country since the eighties. 'Youthships' [*Jugendschiffe*] began to be used as a pedagogical strategy to support rehabilitation processes of prosecuted youngsters in Germany. According to Der Spiegel (1982), "the teenagers between 14 and 18 cross European sea coasts with social pedagogues, teachers and psychologists. As soon as they are on land, they are criminals. But during this five-, up to six-months overseas adventure, they get assisted by professionals throughout a friendlier course back into society."<sup>56</sup>

For von Hentig, this was a perfect learning scenario to teach not just problem youngsters how to integrate into society, but also everyone in Germany right after finishing their secondary studies, before

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56 Die Jugendlichen zwischen 14 und 18 Jahren kreuzen zusammen mit Sozialpädagogen, Lehrern und Psychologen durch Europas Küstenmeere. An Land gelten sie als "verwahrlost", "kriminell", "asozial". Auf den fünf- bis sechs-monatigen Törns wollen die Betreuer ihnen die Eingliederung in die Gesellschaft erleichtern.

going to university. Slightly different to the journey undertaken by 'Gesellen' during their years on the road, young generations on the ship have the opportunity to replace their "scholastic learning by a big challenging experience through practice on an extremely versatile craft, seafaring on a tall ship, recognizing their own strengths and weaknesses while in danger and happiness as a community.

This is possible through their perception of dependency and responsibility, and not ultimately by looking at the world. For them, learning happens on board, something that addresses the experienced or experienter: the physics of the use of the wind, understanding the climate and the weather, the earth and marine perception of routes adherences, the mathematics of navigation" (Hentig 2006, 38 own translation<sup>57</sup>). A trip is likewise of ultimate importance, according to Otto Friedrich Bollnow (1903 - 1991), for men who learn beyond while experiencing changing space.

Learning by doing. Learning by living. *Learning by wandering*. This is the perspective to be stressed throughout this section. To embrace this position, a plethora of possibilities is available to assist our purposeful teaching. In times of digital media, the great success and highly sophisticated process of remediations coincide organic-like with certain human acts; this happens despite the bureaucratic nature of automata.

'Learning' is one human act where computing technologies assist us well, however with a number of conditions that depending on the initiation level of students, remain hidden behind the surface of media. The strange, but friendly relation between the semiotic machine and the semiotic animal leads to the re-evaluation of our traditional "*classroom-as-container discourse*" (Leander, Phillips, and Taylor 2010, 329) and to inquire again what we mean whenever we talk of learning spaces. Universities, as any educational organizations, must open this debate.

It appears to be contradictory that the word »university«, which in its etymological value is related to "*universe, universal, the whole*" (Oxford Dictionary 2013), acquires at some point in history a formal connotation related to fragmentation of knowledges. Similar to *university*, our current understanding of »school« differs from its original postulation. In ancient Greece, "*scholē*" stood for »leisure« (Kittler 2004, 244) where free citizens undertook *epístēmes* in a path of intended discoveries of the world as 'Homo Ludens', 'Homo Faber' and 'Homo Sapiens', in terms of Thomas and John Seely Brown. In Levy

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57 Hier wird das schulmäßige Lernen durch ein großes forderndes Erlebnis ersetzt, durch die Übung in einem außerordentlich vielseitigen Handwerk, der Seefahrt auf einem Großsegler, durch die Erfahrung der eigenen Lebensstärken und -schwächen, einer Gefahren- und Glücksgemeinschaft, durch die Wahrnehmung von Abhängigkeit und Verantwortung und nicht zuletzt durch den Blick in die Welt. [...] Was man dabei an Bord »lernt«, dient unmittelbar der Bewältigung des Erlebten oder zu Erlebenden: die Physik der Nutzung des Windes, dem Verstehen des Klimas und das Wetters, die Erd- und Meereskunde der Wahrnehmung und Einhaltung der Route, die Mathematik der Navigation

(2007, 240)<sup>58</sup> the concept of *leisure* is further explained as “*the highest good, the ultimate aim of human life*” in need of no further explanation more than itself as an “*expression of the human spirit and its true life in the world*”. Furthermore, the author indicates a helpful hint reminding us that the word used for *work* by the Greeks was in fact, “*translated literally as ‘not-leisure’*”. Hence they thought of *work*, or *non-leisure* as some kind of inferior activity, like *téchne* was, merely necessary to perform in order to cover basic everyday activities. The term as explained, matches Arendt’s idea of human in *labour*, comparable to the most inferior level in humankind, whenever we remain oppressed by the natural world.

On (Henning 2004, 143) reflection we can find a useful recapitulation of different theories that envisage learning as a “social phenomena [...] in everyday interactions” and largely based on his review of Jean Lave, Etienne Wenger and Lucy Suchman’s work, among others. Inspired by some of their concepts, Henning underlines the social, historical, instrumental and physical dimensions of learning, as they come to the aid of educational initiatives. With them, it is claimed that perspectives get broader in order to think up teaching episodes closer to the organic approach of learning.

In this sense, the author speaks of “ways of knowing” equally as “ways of learning”, highlighting the importance of a »practice-based approach«. Explained by Dahlbom and Mathiassen (1993, 34) confronting phenomena out of a practical view differentiates itself from the theoretical one as “knowing how to do something” vs “knowing that something is thus and so”. For Henning, the practice-based-approach understands learning as a social action “that involves a dialectical production of individual and group identities, and is mediated in its particulars by semiotic resources that are diverse in their structure, are physical and not mental, and meant for display” (Henning 2004, 145).

A social theory of learning, explains Wenger, consider systems and structures emphasizing “cultural systems, discourses, and history” (Wenger 2000, 12). While embracing such a framework, we look for “patterns” in societies of individuals, an action set that seems to be apt for my argument, however it does not reach the precision that Henning considers in »everyday cognition«, complementary to the importance of all social attributes in human learning where, similar to von Glasersfeld, the *thinking* process lies in reflection of interpretative values.

The term, coined by Rogoff and Lave in 1984, “refers to everyday activities of learning and cognition as opposed to formal learning that takes place in classrooms and in lab settings” (Henning 2004, 146). In such terms, Wenger later explains that theories that comprehend learning as a situated

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<sup>58</sup> Levy’s analysis is partially inspired in Josef Pieper’s work “Musse und Kult”. Originally published in Germany in 1948, it was translated as *Leisure: The Basis of Culture*. It is a sharp critique to “*address the problems of economic and social reconstruction*” and more precisely, it shows his worries about entering a world of work and with it, enhancing “*an overemphasis on economic development.*” (Levy 2007, 240)

event in society “give primacy to the dynamics of everyday existence, improvisation, coordination, and interactional choreography” (Wenger 2000, 12).

The message in Henning, as he associates learning with knowledge, points to the active challenge confronted by higher education in its formative efforts to aim beyond informing (information) or data indexing, which are realms already mastered by the efficiency of the digital medium. How do we fabricate artificial structures able to harmonize with learning in its natural gesture?

In this sense, *knowledge*, I suggest, can be further explained in the light of Thomas and Seely-Brown’s (2009) argument, where they construct their perspective departing from Michael Polanyi’s *Tacit Dimension*, whose work was published in 1967. They conceive of our learning process by denying any idea of knowledge as a transferable object, but as an active affair that takes place actively within two dimensions: the *explicit dimension*, where social processes of science are located, and the *tacit dimension*, where we come to construct our way to know, embody experiences and are integral beings with a mind and a body.

Knowledge is constructed exclusively in presence of both dimensions and therefore is a process of “slow maturation and absorption” (Thomas and Brown 2009, 325). This distinction becomes the centre of the dialectical exercise presented by both authors, specially in their stress on the fact that key theories for them such as “reflection, constructivism or situated learning” embrace practices mostly related to the explicit dimension. However, we lack considering “the implications of tacit learning” (Thomas and Brown 2009, 330). This hasn’t been possible until today because of two reasons: absence of any scalable “infrastructure that has been capable of placing experience and embodiment at the centre of a theory of learning”, and second, because of the conflict that emerges between our “urge to abstract and de-contextualize what is happening in the process of learning”, against the primordial importance of tacit knowledge, which “begins from the premise that every learning experience is different and bound to both the learner and the immediate context in which the learning takes place” (Thomas and Brown 2009, 331).

In this sense it claims to foster digital media, something which is comprehended within the explicit dimension of knowledge, whereas the tacit dimension isn’t properly considered. This may be explained taking up the second reason specified by Thomas and Seely-Brown, namely the need of contextualized reflection.<sup>59</sup>

In addition to their analysis, Thomas and Seely-Brown borrow one more term from Michael Polanyi, which I appreciate as fundamental for this thesis. »Indwelling« is a concept that according to their view, demands the understanding of the “connection between experience, embodiment and

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<sup>59</sup> Thomas and Seely-Brown identify as important for the tacit knowledge what John Dewey called “productive inquiry”.

learning” (Thomas and Brown 2009, 331). Its original meaning from the late Middle English is connected to the Latin “inhabitare”, which implicates the notion of “fixed in body” and “being permanently present in” (Oxford Dictionary 2013). It is clear here that the spatial dimension acquires the uppermost importance, as expressed by the authors:

If we are concerned now with *indwelling* rather than explicit knowledge, then the proper area of inquiry is not on outcome or replication, but on *environment*. From this perspective, we can begin to ask, not *what* are they learning, but *where* are they dwelling or in what are they dwelling (Thomas and Brown 2009, 331).

Talking in terms of the tacit and the *explicit* dimensions is certainly useful; however one has to be careful at it. Being critical of my own pragmatic use of certain terms, it is equally important to consider Barnett’s warning about the definition of *knowledge*. For him, the “very idea of knowledge limits one,” because by accepting these “comfortable positions” discouraging other conceptions, we begin to grow into inflexible positions like the ones being held by scientists as “modern-day priests” (Barnett 2010, 25).

In view of this, I consider equally important to doubt the approach of Thomas and Seely-Brown, as they consider certain frameworks such as *situated learning* reduced to a given dimension (Thomas and Brown 2009, 330). More specifically, in Jean Lave’s contribution to the topic of learning, both Polanyi’s dimensions are represented. Together with Etienne Wenger, key concepts such as ‘situated cognition’ were formally presented framed within the social processes of science, a fundamental feature to declare her input part of the explicit dimension. Furthermore, she clearly mentions the spatial effect that happens as we embody practices. We can see already her interest during later stages, when she devotes extensive attention to Ole Dreier’s work on motion in people in their everyday life. We note also Tim Ingold’s theory of perception, where he argues that evolution is not dictated by “genetically programmed natural evolutionary processes”, but instead due to “change which is imminent in *developmental* processes that extend across persons, practices, and lifetimes” (Lave 2012a, 163).

These elements are fundamental to the tacit knowledge dimension in my opinion, because through them we can recognize the changing context of people as they perform in their everyday practices, where learning/life takes active place and lets us develop after experiencing:

[···] tracing persons’ movements across the various contexts of their everyday lives is necessary for understanding how participation changes in changing practice. Furthermore, this leads him to explore how persons are not “the same” in different situations: Their identities are partial and plural (Lave 2012a, 162).

As we have seen, Lave's work begins back in the day when she, together with Barbara Rogoff, coins the notion of *everyday cognition*. What is important about this term, and in general Lave's approach, is that she acknowledges our human capacities closely knitted to the context in which they take place, in the social, in the everyday world. This is fundamental for her, because to understand learning in terms of theory and practices, we are in need of this interconnected state of ubiquitous dwelling:

First, we need to ask how learning works in the world through the conduct of everyday life (or dwelling, or skill) and, second, we need to ask how conducting everyday lives, or craftsmanship take the forms and relations they do because they are in part practices of learning (Lave 2012a, 165).

An important feature that I highlight in Lave's work is the relevance she confers to all political repercussions to be found in practices and theoretical approaches. For her, it is clear that learning is a social act that happens unrestrained throughout practices, in such terms there is no better no worse learning. We live, we learn. This aspect is normally highlighted when she states her social practice theory of learning:

Theories that reduce learning to individual mental capacity/activity in the last instance blame marginalized people for being marginal.[...] It seems imperative to explore ways of understanding learning that do not naturalize and underwrite divisions of social inequality in our society (Lave 1996, 149).

For Lave, one particular experience became fundamental for the development of her later reflections. During her time in Vai and Gola, in Liberia, West Africa, she observed and studied the system of tailors' apprenticeship, where important findings surfaced. For her, the Scribner and Cole (1973) educational model on formal and informal approaches had to be revised, because "informal" practices of learning are as valid as all practices we like to produce within "formal" educational practices. In fact, the social impact behind the "efficacy of standards" should keep raising doubts about the implications in terms of a continuously fragmented society. (Lave 1996, 150).

An interesting analysis is mentioned by Lave (Lave 2012b), as she explains theory and practice in terms of bureaucratic and pragmatic approaches. According to her interpretation, central topics such as (a) *research training*, (b) *research activity*, (c) *theory of knowledge* and (d) *learning* are understood differently in each of the approaches.

Correspondingly for Lave, traditional *bureaucratic* structure and *pragmatist* structure should be presented together, in the middle of their contradictions (a) *schools vs apprenticeship*, (b)



*methodology vs craft and art*, (c) *facts and rules vs situated knowing* and (d) *technical rational vs social practice*. They are two different approaches, one praising school and formal knowledge, the other one focused on everyday life and craft apprenticeship. But for Lave, these two different perspectives could be studied in addition to a set of binary polar opposites, two *ivory towers* that stress distance between traditional views on learning.

In the new proposed “binary theory” of inequalities, she confronts them in terms of (a) *formal education* versus *informal education*, (b) *experimental method* versus *ethnographic/qualitative research*, (c) *decontextualized general knowledge* versus *everyday knowing in context*, and finally, (d) *general theory* versus *particular, limited, context-specific knowledges and skills*.

It is clear for Lave that there are those who think in terms of the formal and traditional approach: basic commitments that belong to the classical philosophy of the mind and psychology of learning. In comparison, the informal approach could look like a tiny part of the category, “a peripheral subsidiary” (Lave 2012b) that seems almost trivial in the presence of what is mainstream. But with *apprenticeship* a major concept for Lave, her interest is to demonstrate that this is precisely the challenge to overcome at our institutions: it is not as easy as simply conceiving, but appears as different approaches standing for the same matter, but suppressed because of the uneven relation that undermines the importance of what is traditionally indicated as “informal”.

A critical position is fundamental to realize these aren't just two approaches jumping from one to the other. On the contrary, the traditional structure that allows the invisibility of “apprenticeship”, is a vital concept that allows us to rethink education in society. For Lave, supporting the belief of bureaucratic and pragmatic views in relation to theory and practice only benefit *formal education*, the *school-centered* approach that divides us and all of those un-educated people, that aren't part of society because of their inability to become recognized learners. For her, this is one of the main challenges to overcome among all the precarious problems we face in today's society:

Because learning, wherever it occurs, is an aspect of changing participation in changing practices. (Lave 1996, 161).

For this reason, *change* is recognized as a cornerstone to Lave's argument. Seeing “learning as a matter of changing relations between persons and their practices in a changing world” (Lave 2012b), she stresses attention on movement, where people are socially involved in their experiences, being changed by their participation in everyday practices. In this sense, her idea of change is close to Arendt's idea of *action*, but also permeated with the spirit of the *dialectical system thinker*, where change is “political change. In other words, we need to make familiar and recognizable our own

everyday possibilities for “revolutionary praxis” and take them up in our research practice” (Lave 2012a, 169).

Her intention is clearly described by William F. Hanks in the foreword of “Situated Learning, Legitimate Peripheral Participation” (1991), where it is stated that together with Etienne Wenger, their questions aimed at finding out “what kinds of social engagements provide the proper context for learning to take place” (Lave and Wenger 1991, 14), instead of the traditional attention given to cognitive approaches or processes related to conceptualization.

Endorsing our standpoint about orthodox learning conceptions within any social institution, as previously discussed with Lave’s considerations, this makes us inherent supporters of the social impact caused by such systems that act in representation of humanistic education, but end up favouring those who are educated<sup>60</sup>, leaving few chances to include other social interactions as valid platforms.

Moving forward, it should be noticed that in Wenger and Lave’s book, the title announces two fundamental concepts: »situated learning« as in situated cognition, is explained by Hank as “the relationship between learning and the social situation in which it occurs” (Lave and Wenger 1991, 14) but here, is correlated to the »Legitimate Peripheral Participation (LPP)« factor, which is explained in short by Wenger as “the process by which newcomers become included in a community of practice” (Wenger 2000, 100).

Both from different fields, Lave as a social anthropologist and Wenger from a computer science background, met and collaborated in their shared interest in social, educational theory and cognition. In the foreword, Hank sums up not just the idea of change as something around us, but also in the sense of the changing role we must undergo in different life scenarios:

LPP is not a simple participation structure in which an apprentice occupies a particular role at the edge of a larger process. It is rather an interactive process in which the apprentice engages by simultaneously performing in several roles - status subordinate, learning practitioner, sole responsible agent in minor parts of the performance, aspiring expert, and so forth - each implying a different sort of

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<sup>60</sup> An illustration comes in connection with traditional human intelligence tests commonly known as “IQ” tests (after Intelligence Quotient). In the presence of certain standards related to thinking processes, they measure expected behaviours confined within a range of known units. In this sense, as stated by Nake (2012, 62), these tests are “not much about crossing boundaries.” In this sense, when something is measured framed in this context, it is transformed into “an attribute, a property, or a feature that we may acquire by taking courses or joining training camps, we put creativity close to a thing, or a commodity.” (ibid.,62) The standards being measured aren’t representations of the intricate nature of learning, nor the changing and developing knowledge one constructs or is to achieve.

responsibility, a different set of role relations, and a different interactive involvement (Lave and Wenger 1991, 23).

In a separate article Lave (1991, 68) indicates that LPP as a “distinctive description of learning”, should be comprehended as a bridge that communicates “the development of knowledgeable skill and identity -the production of persons- and the production and reproduction of communities of practice”. In this setting, emergent components become elementary for individuals as they integrate into the social mesh. Experience, access (of a legitimate kind), participation and practice intervene in this picture, while in the meantime learning takes place by adopting interchangeable modes. But these individuals within the LPP structure are apprentices, as noted by Hank in the previous quote. This feature is of utmost relevance to this thesis, because as they speak of them in terms of »apprentices« and »masters«<sup>61</sup>, they do not intend to present these concepts as a “disguise” indicating the traditional relation between a teacher and pupil, but instead the uncertainty and flexibility that is typical for both of their suggested denominations.

For her, “masters usually do not have a direct, didactic impact on apprentices’ learning activity” (Lave 1991, 68) which does not mean that their influence is fundamental to processes related to their learning or accessing ‘communities of practice’<sup>62</sup> in the common field with which they are associated. On the other hand, *apprentices* have all proper conditions to contextualize their learning in an early stage, as they have a “broader idea of what it is about than just the particular tasks in which they are engaged or that are most easily observable” (Lave 1991, 69).

Henning (2004, 153) addresses a critique for both Lave and Wenger. For him there is an issue related to their empirical work: as it is limited it causes a “generic and faceless” effect upon the main actants in their theoretical analysis. For him, making theory without extending empirically becomes a comfortable stance and neither Lave’s Liberian tailors nor Wenger’s insurance claims processing done during the 1980s is enough.

However, he finds in *situated learning* a term that incorporates the sense of the ‘practice-based approach’ and the ‘everyday cognition’ by locating “learning at the middle of co-participation rather than in the heads of individuals” (Henning 2004, 147). In his article, we must be aware that the author also offers relevant examples in the field of mathematics, specially because it is a field that traditionally

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<sup>61</sup> The importance of apprenticeship as a starting point is expressed by (Lave and Wenger 1991, 29), as they note that in “1988, notions about apprenticeship were flying around the halls of the Institute for Research on Learning, acting as a token of solidarity and as a focus for discussions on the nature of learning.”

<sup>62</sup> Because of its relevance to this thesis, the theory of Communities of Practice (CoP) is explained later and more extensively in section 3.7.

deals with abstraction and cognitive thinking, hence it is a challenge for learning theories such as situated learning and ‘communities of practice’.

Nevertheless, Henning collects a number of references that are relevant to “math practices embedded in ongoing significant social activities” where math problems can be solved “in a rich context that requires naturalistic or ethnographic methods as a research tool rather than statistical analysis of test results” (Henning 2004, 149).

It is also clear to Ernst von Glasersfeld that the cognizant subject is exclusively learning in its own and unique way. Just as with Lave and Wenger, he indicates that knowledge is built by that person only, and not “passively received” by a third party. His second suggestion about the model of learning addresses the function of cognition, describing it as “adaptive and serves the organization of the experiential world, not the discovery of ontological reality” (von Glasersfeld 1996, 18).

We live, hence we learn and build actively a kind of knowledge which is personal and never transferrable nor shareable. In a discussion in Argentina years later, he reminded us that whenever we speak in terms of sharing meanings, it is “pure nonsense”, because what we have learnt so far is “to make our meanings in such a way that they are compatible in most situations” (von Glasersfeld 1991, 14). To illustrate this understanding of knowledge through learning, Dahlbom and Mathiassen offer this example:

To know how to ride a bicycle, we must be able to identify bicycles, pedals, handlebars, and the like, but we don't have to know much more than that about bicycles. A small child or even a monkey can ride a bicycle. To identify a bicycle, we need the concept of bicycle, but our competence as bicycle riders does not demand a particularly rich concept. We are not expected to be able to define this concept or be able to argue for or against calling something a bicycle. In contrast, when we claim to know what a bicycle is, such abilities will be expected of us. All knowledge that something is the case demands the explicit and competent handling of concepts (Dahlbom and Mathiassen 1993, 34).

To further clarify, we know that von Glasersfeld based a considerable portion of his argument on Piaget's work. Consequentially, he proposed to consider a learning theory that focuses attention on *unexpected* results as its central approach, which in Piaget's terms, would be to think of a kind of learning and knowledge which is instrumental. According to him, there are two kinds of instrumentality: *utilitarian and epistemic*<sup>63</sup>. *In both cases, they are the product of “perturbation” after a*

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<sup>63</sup> The kind of learning and knowledge we acquire in the accommodation sequence is of an instrumental kind, where two types are mentioned. At all times, this sequence is initiated and profited in terms of »assimilation«, which is important for humans and

“scheme” does not manifest itself as expected by the individual. In the face of this, “accommodation” happens to “maintain or reestablish equilibrium” (von Glasersfeld 1996, 68).

Learning, as explained by von Glasersfeld, and as I interpret it is initiated by *failure*. This is to be explained first of all by considering the idea of “schemes”. Originally conceived on a biological principle, the term is proposed in the light of operational responses in living entities who, whenever a stimulus approaches them, follow it by a genetically determined response. However, in our cognitive possibility, we are not genetically determined. In presence of new elements, we adapt. The »action scheme«, which is introduced by von Glasersfeld considers simply a change of words, and it is a *tripartite pattern*:

1. Recognition of a certain situation;
  2. a specific activity associated with that situation; and
  3. the expectation that the activity produces a certain previously experienced result
- (von Glasersfeld 1996, 65).

In learning, the tripartite pattern takes place after recognizing a situation which is known for us; we perform and what is expected isn't met accordingly. »Perturbation« happens, »sensorimotor learning« with it. We proceed to review, if possible, the scheme which we underwent and we will make some modifications to the original scheme or if the surprising result is positive, “a new recognition pattern may be form” (ibid.,65).

This whole process of reviewing, modifying or adding is what is called »accommodation«. For what it concerns, this sequence of actions is conceived in a rather isolated way, namely a cognizant subject that interacts with the physical world. For this reason, Piaget is “often criticized for not having taken into account the social component” (von Glasersfeld 1996, 66).

However, a way to understand this weakness is offered. As the author stresses the importance of perturbations for our cognitive development, he recognizes this possibility by »equilibrating« them, hence increasing the range of performance of the individual to deal with more perturbations. While collecting more references, more combinations will be available to improve the *accommodation* exercise that leads to reestablishing equilibrium in the individual.

In von Glasersfeld's reflection, he notes the missing social element in Piaget's model as he says that “the most frequent occasions for accommodation are provided by interactions with others” (ibid., 66).

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beings in “achieve goals -sensory equilibrium and survival- in their interaction with the world they experience” whenever we talk of utilitarian knowledge, but as well in terms of the reflective abstraction and conceptualization, “ helping organisms achieve a relatively coherent conceptual network of structures that reflect the paths of acting as well as thinking” (von Glasersfeld 1996, 68). This instrumental kind of knowledge is what its described as epistemic knowledge.

This contention, complemented by Wenger and Lave's claims about social learning theories, becomes the foundations of the learning concept I assert should be taken up for any educational structure that aspires to promote humanism.

In Lave, Wenger and von Glasersfeld we find a shared vision: neither formal nor informal, since it is in action that learning happens, naturally and immersed in society, negotiating each of our exclusive constructions of knowledge actively, in constant change. While these series of statements may sound agreeable for many, they actually defy the adaptive capacity of bureaucratic structures in the presence of the organic nature of learning, for instance higher education as the place for learning.

But why now? It would be tremendously reductionist to identify elements, however different to other historic moments of this debate<sup>64</sup> it seems that our current social configuration acquires a new setting. Instruments definitely play a big role. But why and who is profiting from it? Higher education? According to Dahlbom and Mathiassen (1993, 91) this cannot be the case as the "truism that people learn from their mistakes [...] rarely enters the world of scientific and technological methodology". Therefore, up to this point I consider it more fruitful to accept Thomas and Brown's suggestion, since for them a "new type of learning" becomes apparent:

The new culture of learning fees based on the principles: (1) The old ways of learning are unable to keep up with our rapidly changing world. (2) New media forms are making peer-to-peer learning easier and more natural. (3) Peer-to-peer learning is amplified by emerging technologies that shape the collective nature of participation with those new media (Thomas and Brown 2009, 50).

(1) Speed, (2) new media -for us digital media- and (3) ubiquitous interaction between humans. These three components are characteristics that pervade without exception among culture and contexts, already foreseen by authors such as McLuhan, who in the '60s thought of media as the

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<sup>64</sup> Already since John Dewey in the early 1900s, strong debates remain relevant to the discussion of our educational system. It is known that during the '60s and '70s, different initiatives in Europe and the United States focused attention on the study of space and its influence on human learning. Referents for this thesis comprehend different influential works found since the '40s, when fields such as cybernetics and system theory (see p.180) are among those scientific bodies paying close attention on the study of phenomena beyond the isolation of elements, (Smith and Smith 1966), and closer to the context or scenario. Philosophy, literature and the arts contributed greatly as well as seen in Bollnow (*Mensch and Raum, 1963 / translated as Human Space, 2011*), Edward T. Hall (*The Hidden Dimension, 1966*) and Lefebvre (*Production de l'espace 1974 / translated as The production of space 1991*) are some others. Organizations such as The Situationist International (SI), the critique raised by the poststructuralist movement as media theorists (Bolter 2003, 18) and the pedagogical effort of Ivan Illich in books such as *Deschooling Society* in 1971 followed by *Tools for Conviviality* in 1973, are among these efforts I refer to. Coincidentally with the appearance of the Internet, new authors and numerous initiatives delve further into the relevance of space in education, but still, most focus attention on lower than tertiary levels. (McGregor 2004, Temple 2007).

highway towards speeding information and with it, “the formation of new communities” (McLuhan 1994, 90). This is one of the vehicles that set in motion the type of learning Thomas and Brown talk about. Their vision matches in a way the endeavour of some intellectuals who in the late ‘80s took “activity theory”<sup>65</sup> and developed it into new forms:

In the Scandinavian version, Yrjö Engeström is particularly known because of his adaptation of the theory under the term »expanded learning«, where “instead of stressing the theoretical model, he focuses upon the activity system itself” (Young and Guile 2003, 75). In it, the importance is upon communities that do not aim ultimately to acquire or participate, but to “construct a new object and concept for their collective activity, and implement this new object and concept in practice” (Engeström and Sannino 2010, 2).

When someone is learning by expanding and is driven by contradictions, this is the legacy of dialectics, in order to transform something and expand it towards a new activity. The relevance of the »activity«, talking in terms of Engeström, is to be found in a chapter he entitled “the Emergence of Learning Activity as a Historical Form of Human Learning” (Engeström 2014, 32). There, he announces four different delimitations to describe human activity: *first* a plea to re-present activity as the simplest, genetically original unit.<sup>66</sup> The *second* delimitation is a condition for activity, as it is to be studied “in its dynamics and transformations, in its evolution and historical change”. *Third* is again another condition, this time to stress the importance of the relation between individual and context, as activities are “contextual or ecological phenomena”. *Lastly*, Engeström states emphatically that any activity we perform, is going to be mediated culturally.

For this, he took inspiration in Hegel’s triadic structure to offer a new version of human activity where culture is primordial. He offers a triangle of relations explaining animal nature, and then taking into account the different ruptures that were necessary to evolve from animal to man, he shows his idea of the structure of human activity (Fig. 06).

In our intricate relation as individuals, society and environment; nothing is to be considered isolated in its dynamic and changing nature. Finally, Engeström offers his concept of activity, which is a development of the previous two scenes and with a core idea: the importance of activity in animals is

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<sup>65</sup> To study further the foundations and history of Activity Theory, the University of Helsinki offers a variety of online options. Formerly known as the *Center for Activity Theory and Developmental Work Research*, the Center for Research on Activity, Development and Learning (CRADLE) is a running and active hub that specializes and continues further the academic effort initiated in the ‘80s. Prof. Yrjö Engeström is the current director.

<sup>66</sup> Engeström discards immediately Habermas idea of action because of his differentiation between labor and interaction. For him, activity always remains a unit, understood and constructed out of its internal tensions and relations.

towards “adaptive activity” but then as we evolve into men, the core “is transformed into consumption and subordinated to the three dominant aspects of human activity -- production, distribution and exchange (or communication)” (Engeström 2014, 62). It is important to notice that in this Engeström recognizes the idea of *natural learning* in humankind. This basic and natural way of learning he called “learning actions” that were fundamental because they were directed towards consumption. Explained as *operations* of “transmission of knowledge and experience” (ibid., 74) they certainly do not fit the arguments I raise in this thesis, as learning transcends the operative dimension.

I find specially elucidatory Engeström’s analysis because he makes use of theoretical and practical stances. To explain the concept of activity he undertakes the first one, but then he concentrates on the idea of »activity of learning« and he presents three lineages that belong to the practical realm: “the activity of school-going, the activity of work, and the activities of science and art” (Engeström 2014, 75).

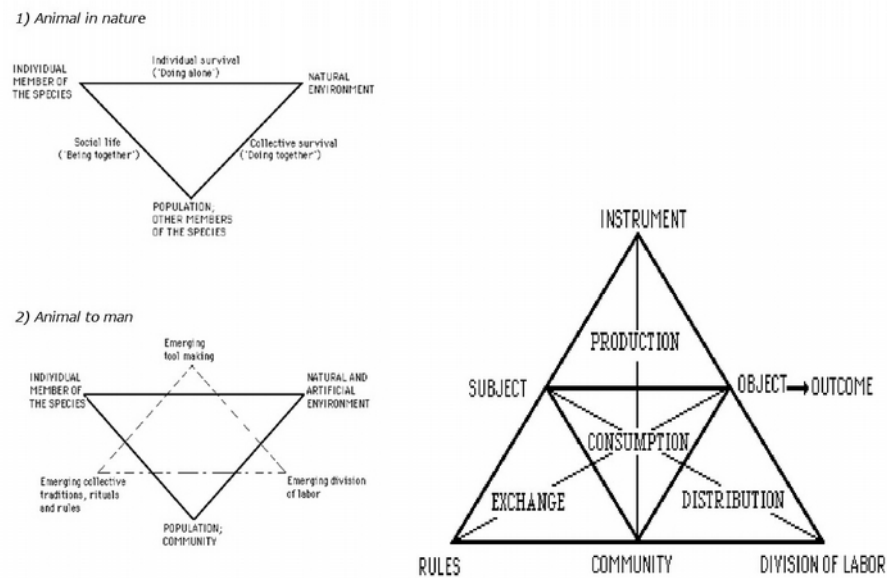


Fig.06. Engeström triadic structures in Learning by Expanding

In the case of the first lineage, learning is compared in the light of *school-going*, which emerged primarily as a process in benefit of literacy, that is, to initiate humans in the alphabet as a key to enter the realm of production in society. In contradiction, schooling is presented by the author as a “far cry from learning activity” (Engeström 2014, 82). However, it is of interest that he presents this lineage followed by “age-old” attempts of learners to strike the system.

This becomes part of the continuous contradiction that characterizes the concept of activity, yet it



is accepted that there might be a chance of a “crisis of new qualitative dimensions” (ibid., 82) with the increasing *participation* of students in early stages, taking initiatives in the societal production, just like computer hackers, sports stars and performers do. Meant as a critique of the voracity of capitalism, I take this more as an invitation to explore possible actions within the dialectical system of thinking.

In a second lineage, learning is conceived through *work activity*, which emerges necessarily for every individual in need to learn about unalterable actions that must be followed. Engeström considers this lineage “inferior to learning in school: more restricted, even crippling in its adherence to fixed routines” (ibid., 83).

Finally, *science* and *arts* appear as learning’s third lineage. Similar to Weibel, the division is noted between “handwork and experimentation” different from “logical thinking”. Skilled artisans such as “engineers, artists, healers, navigators” were downgraded in presence of “scholars and humanists, trained in logical thinking” (Engeström 2014, 92). Engeström discusses a divide between sciences and craftsmanship, which ends up favouring the idea of models, descriptions of the natural world and by such methods, transforming it into something nonexistent, an activity of “indirectness”. (ibid., 93).

Unlike *school-going*, a subject that produces activity, or traditional science that focusses on an instrument-producing activity, learning activity is presented as an activity producing another activity, a recurrent nature. In the words of Engeström:

The object of learning activity is the societal productive practice, or the social life-world, in its full diversity and complexity. The productive practice, or the central activity, exists in its presently dominant form as well as in its historically more advanced and earlier, already surpassed forms. Learning activity makes the interaction of these forms, i.e., the historical development of activity systems, its object (Engeström 2014, 99).

Similar to Thomas and Brown, other intellectuals working with ‘activity theory’ did not believe that learning was an indoor, school-centered event. They explored it happening “without books, without teachers, and without classrooms” (Thomas and Brown 2011, 18), which for me, is one of the valid conditions to evoke the idea of natural learning. An example is portrayed by some of the academics looking into the subject related to *transfer and boundary crossing between school and work* (Tuomi-Gröhn, Engeström, and Young 2003), where they point at multiple issues around our learning systems, mostly related to applying that which is being studied in traditional classrooms whenever we are confronted with them in everyday life (Young and Guile 2003, 2). They recognize the importance of an *interface* between school and work in order that both organizations benefit from each other, and with this, the noteworthiness of the context is once again highlighted following their belief that the “object

of learning activity is the societal productive practice, or the social life-world, in its full diversity and complexity” (Engeström 2014, 99).

We must keep in mind that in their case, they inquire “vocational education” the core of which is to develop known and specific knowledges of procedural nature. Different from the structure of apprenticeship as Lave described it in her case study in Liberia, is the opportunity in the conjuncture between work and school. There, students have the chance to perform as mediators (Young and Guile 2003, 4), which allows an expansion of their activities in reflection to each other, always as social beings within different communities. This possibility enhances the emergence of ‘boundary objects’, a fundamental concept to study recognized also by Wenger in his theory of communities of practice. For the authors, boundary objects “emerge over time from the interaction between different communities” (ibid., 5).

It is also important to consider that when they talk of “transfer” activities, they do not mean it as something that involves trading non modifiable units of concealed nature. Instead, the dialectic relation described for learning activities applies to this scenario where the essence of it is “mastery of expansion from actions” in order to transform, thus achieve a “new activity” (Engeström 2014, 99). For this, we need exploration of discrete, natural elements using contradiction as they are always part of systemic interrelations.

As we do this, we are able to transform them in order to expand activities into new ones, now reevaluated within a new context. The transference of activities from school to work, or elsewhere, relates to this process, which is “multi-directional and multi-faceted”, and “on account of its dynamic nature, this process is called developmental transfer” (Young and Guile 2003, 4). For it, “transition” as a concept is pertinent because it should announce change as something consequential to individuals, but also as social beings in dynamic contexts. As Tuomi-Gröhn and Engeström (2003, 28) state, “all forms of transition involve the construction of knowledge and skills”.

Some people talk of *connected learning*, embracing the lesson out of different learning approaches (Ito et al. 2013, 42), renouncing the idea of formal education as it is “disconnected and lacking relevance” (ibid., 45). Others call for *Seamless Learning* (see p.86), formerly known as *Mobile Learning*. They think “that the success of learning and teaching with mobile technologies will be measured by how seamlessly it weaves itself into our daily lives, with the greatest success paradoxically occurring at the point where we don’t recognize it as learning at all” (Naismith et al. 2004, 36).

Yet, despite the opinions of Engeström, von Glasersfeld, Lave and Wenger or all last generation automata hammering the urge of a newer idea around formal learning, sectors such as higher education aren’t prompted to take a stance, but contrarily, many remain quiet, preferring to hold to

traditional ideas. This passiveness may be caused partly because it seems that our manufactured models for learning have pulled the miracle of containing, administrating, measuring and commodifying the idea of education in terms of categories such as formal, informal and vocational.

The interest seems to reinforce the idea of controlled order, where a given agenda determines which “knowledges” fit our society's configuration better. Notwithstanding, a newer idea of formal learning calls for decisive steps and demands an integrated effort through a variety of contexts, all of them collected as part of a global agenda.

But independently of the ‘massification in higher education’ (Gibbons et al. 1994) and all the relevant arguments raised, many of those who support the idea of ‘natural learning’, may mistrust considering traditional bureaucratic systems as entities able to satisfy the unpredictability behind an organic approach (see p.35). This becomes clear by observing a new generation of shapes and trends that are determined to remediate the traditional structure of our universities and end up turning universities into corporative dependencies, seduced into growth and expansion without borders in spite of the external compromises necessary for it (Barnett 2010, 50).

For regions like Central America, this challenge becomes overwhelming. There, apart from having a specific context worthy of analysis, national agendas still strive to improve conditions regardless of their limitations in terms of funding and research initiatives. So far, important phases and lessons have been achieved within the region, however, the menacing ghost remains, since such “middle- and low-income countries are in risk of further marginalization”, away from “development in a globalized world” (Meek, Teichler, and Kearney 2009, 10).

The challenge also applies to places like the Universidad de Costa Rica, where traditional theories around teaching and learning remain. In this institutional framework, educators and authorities agree on the paramount importance of education as a social project (see section 5.1.), yet their discourse doesn't match the kind of spaces of learning currently experienced.

To reflect deeply on this issue, I discuss the educational design at the university. Established around elements that seem to restrict us, the space of learning which is consistent with the social project once intended for education seems out of reach.

*Control* for instance, remains one of such necessary aspects to revise, as it becomes a cornerstone of the traditional approach of university teaching and its action within classroom boundaries. What kind of impact does *control* inflict on the learning experience of students? For many, teaching should be conceived as a purposeful action driven in terms of outcomes, where “there is no such thing as an unmotivated student: all students not in a coma want to do something”.

Our task is to maximize the chances that what they want to do is to achieve the intended learning

outcomes. Unfortunately, there are many aspects of teaching that actually discourage them from doing that: we need to identify and minimize these as far as we can (Biggs and Tang 2007, 31). However, education as a social project cannot be reduced to a precise idea of contained outcomes, but to the boundless spirit driven by learning as a natural event. The challenge is on.

### 3.6. HOMO MULTUS / HOMO FLUXUS



Fig.07. In areas where bees have disappeared, work-labor pollinates flowers in China by hand. Photo by Barker (2014)

There is a metaphor that catches my attention every time. Bees are a fascinating topic for many. Lately, they have been the object of attention because some studies demonstrate (Burnside 2015; Engel 2001) that our artificial methods to manage honey production and pollination are threatening their existence. While leaving aside the idea of all terrible consequences this means for the environment, others focus their attention upon the natural organization within the hive. They talk of bees as “highly efficient foragers”, where “the division of labor allows task specialization” (Engel 2001, 1661).

Colloquially, people like to say also things such as “that farmer works like a bee” and by that, they are describing the work of the farmer who builds a new barn to store grains. As we observe this farmer, he happens to be constant and disciplined at work just like a bee is, efficiently labouring while building a hive.

Certainly there are people in our world who behave as if they were bees, whose specialization of tasks turns them into *animal-laborans*, in Arendt’s terms, and demands they be highly efficient, just like bees (Fig.07). But reflecting on the farmer and the bee as they perform, there is far less to compare between them both. In our metaphor, even the laziest farmer is ahead of the hardest working bee. Why is this? Because the yawning farmer before moving a muscle, still lying in bed, first think of this barn in his mind. The bee in the meantime, labours simply forced by nature.

To build the idea of human activity, Engeström was in need of two layers intersected: animal and men. This exercise is equally noted in Hanna Arendt's *Vita Activa*, where she discriminates between the concepts of *labour* – that is men as *animal-laborans*– and *work*, where men manufacture objects to make their world inhabitable.

In this section I continue suggesting other descriptions for the idea of men, notions that have been mentioned by authors in literature relevant to this thesis. My intention is to broaden the vision of the human first as *Homo Multus*, making use of the Latin particle »multus« to denote “much, many” (Oxford Dictionary 2013).

In this first object, I think of us in our *post-media* condition, a sort of democracy of interaction in terms of Peter Weibel, but also following the principle of *repeatability*, which is the core of mechanical development as explained by McLuhan. Secondly, I propose *Homo Fluxus* where »fluxus« is presented from the Latin particle that comes originally from *fluere*, that is “to flow” (Oxford Dictionary 2013), because we are humans in times of *liquid modernity* according to Bauman, following a digital hype of *one-many* in terms of Diana Laurillard, where the algorithmic sign allows humankind to have not just *one of a kind* as has been normal with old-fashioned artifacts, but also able to produce *endless different instances of a same class*.<sup>67</sup>

On the verge of these perspectives, Douglas Thomas and John Seely Brown (2009) perceive our society context as featuring various concepts relevant to this research. They talk of a society immersed in *rapid change and constant flux*, a given condition in need of reconsidering our educational practices. They insist that so far, our structures have kept up well with the idea of a stable world, yet are we in need of a theory of learning pertinent to a new historical moment of rapid and changing nature.

For this, they see in the “social context of new media” the opportunity to “examine learning in the context of three frameworks: knowing, making and playing”<sup>68</sup> (Thomas and Brown 2010, 323). It is

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<sup>67</sup> This is the condition of the “metaphor machine”, as we learned in section 3.4.1. These concepts may well serve us to later reflect on certain characteristics of the space of learning at the Universidad de Costa Rica. Following the computing machine example – a bureaucratic object that seems to adapt well to organic structures – certain key concepts will be stressed as they seem to be relevant to the configuration of learning spaces of higher education. This implicates an approach to learning in its changing nature, where humans live and by that, learn.

<sup>68</sup> In a revised version offered since 2010 in John Seely Brown's website, three analogies match these frames: *mind, body and imagination* (Thomas and Brown 2010, 325). This theme that I interpret closer to the organic, humanistic approach has been certainly pursued in recent literature, hence offering alternative theories for unquestionable traditions in the field of evolutionary theories. Two examples of it are Wrangham (2010) and Ingold (2000) where coincidentally, a move in the direction of bodily attributes is chosen instead of our cognitive legacy: the former considers *cooking* as the driving force for our evolutionary success or, in the case of Ingold, the human evolution explained “not between technology, language and intelligence but between craftsmanship, song and imagination” (Ingold 2000, 407).

precisely in these frames that they offer their analysis of men accordingly as 'Homo Sapiens', 'Homo Faber' and 'Homo Ludens'.

In their explanation, they match Peter Lunenfeld's idea on the aesthetic of "*unfinished*" (Lunenfeld 1999, 8). The authors speak of a new century where knowledge is not static anymore. Before, "to know something", "learning about" or even "learning to be" was enough. Now, the new rapid era of uncertainty prompts us to rethink "learning as a practice of becoming, over and over again" (Thomas and Brown 2010, 321), which is in any case a kind of learning that demands a focus on space, that is context, instead of time sequences normally linked to traditional content that soon enough, become outdated in change (Thomas and Brown 2010, 326).

Previously, in section 3.3. I suggest considering men as »Homo Faber« to associate it with Arendt's idea of *work*, where men are able to manufacture objects despite the upmost pressure that nature works against them. In this sense, Richard Sennet (1943 – ) –an assiduous analyst of Arendt– affirms that her thinking of *Homo Faber* is presented as superior to *animal-laborans* (Sennett 2009, 6), who dedicated to *labour*, is able to think only about finishing the duty (ibid., 7).

In the light of this analysis, similar to Engeström's position when he refuses Habermas notion of *action*, so Sennet also refuses the idea of humans unable to think as they labour. For him "thinking and feeling are contained within the process of making" (ibid., 7) and instead of any superiority, "animal laborans might serve as Homo Faber's guide" (ibid., 8). Similar is Nike's (2008a, 318) view, who emphasizes in *Homo Faber* the idea of activeness. Close to the mode of *learning activities* as explained by Engeström, men act upon a unit to transform it and expand it towards a new activity. Nike analyzes *Homo Faber* similarly, as the load of the *animal-laborans* remains endless, having no other choice but to keep on working.

Two more aspects are fundamental for Thomas and Brown (2010, 327) to complement our understanding of *Homo Faber*. The authors' interest is to extend the traditional notion which is related to "making". For it, they link the idea of *indwelling* intimately with *Homo Faber*, which means that in constant change we only "understand something by connecting to it and, literally, living and dwelling in it" Thomas and Brown (2010, 327). Secondly, the authors insist on *Homo Faber* being constructed in reference to *Homo Sapiens*, which indicates the necessity of *knowing* along with it, this by the shared character they have which is *participation*, here interpreted as they join the social arena, where humans complete cognitive and craft aspects by 'negotiating' meanings, deeply with others, beyond the surface:

To know something deeply is to understand the explicit dimension though our embodied engagement with its tacit dimension (Thomas and Brown 2010, 328).

There is an interesting input by Sennet in his book *The Craftsman* (2009) that may help to shed light on this joint idea of *Homo Faber* and 'Homo Sapiens'. In one of his passages, he focuses attention on the *human hand*. In it, a disagreement between two views takes place: one explains there is a control mechanism over our hands in the light of our nervous system, which ultimately is the key for us to become »Homo Sapiens«. However later in history, the evolutionists came to affirm differently, that our brain developed next to the use of our hands, denying exclusivity to the brain structure.

Sennet finishes his reflection acknowledging Raymond Tallis, who discusses how it is that “the physical structure of the hand has itself evolved”, and for it, Tallis states evolution took place in view of our “freedom to move the thumb at the trapezio-metacarpal joint” (Sennett 2009, 150).

Freedom to move, one concept that resonates in the philosophy of Arendt as the ultimate state of the human being, takes place as we physically move a joint of our hand. *Homo Sapiens* is the human as knower, but knowing comes tightly together with the use of our hands.

For Thomas and Brown (2010, 326) the major conflict with our traditional belief of *Homo Sapiens* as a human that knows, is that we don't face anymore a paradigm in society of “facts” and accuracy as it used to be in the 20th century, something understood as the “*what of information*”. For them, a world of change takes place as “new media technologies [...] force us to consider both the where [...] and the when”. With the former, they consider *Homo Sapiens* in need of awareness of who, within a context; by the latter they indicate a value of immediacy, of currency and speed. According to Barnett this last characteristic is an important issue in academic terms.

As such, he argues about the tension in contrast with our scholarly life, one which is highly dependent on the context of specific activities, thus they “resist quickening”. Archaeologists or historians *knowing* of what is past, research programmes that (should) take years, and planning for upcoming terms (Barnett 2010, 74).

Yet again, for Brown and Douglas the importance is not to know, but knowing. They acknowledge this acknowledgement by “the when” but with »participation« as a concept (Thomas and Brown 2010, 327). In this new understanding of learning in fluxus, *Homo Sapiens* participates in communities of practice and is no longer needs a *telos*, because as with Engeström's idea of learning by expanding, activities within communities of practice will seek new practices, this as *Homo Sapiens* takes part constantly in persistent change of context, that is, spaces of participation.

Finally, in »Homo Ludens« we are humans as players. This term should not be understood without considering Johan Huizinga, who presented his influential study in 1955 entitled *Homo Ludens, a study of the play element in culture*. Noted by Sennet, he finds of the greatest importance Huizinga's position in terms of our loss after the Industrial Revolution:

[...] when utility rules, adults lose something essential in the capacity to think; they lose the free curiosity that occurs in the open, felt–fingering space of play (Sennett 2009, 270).

Along with this assertion, Sennet offers an interesting hint from the anthropological perspective. His claim suggests a “formal gravity” of our society that when stripped from play, we pursue *ceremonies*. With Clifford Geertz’s “deep play” concept, he points to this subjacent nature of humans in necessity of playing with examples around a cup of coffee between merchants in Middle East, cockfights in Indonesia or a festival in Bali (Sennett 2009, 270).

Academy is not exempted, as there are important arguments about tribal rituals, rites and notions of belonging in communities among scholars that respond to this approach. In Britain, Tony Becher has worked on this topic profoundly influenced by Geertz, (Becher 2001, ix) and in Costa Rica, Cascante and Francis have reported their contextual analysis about academic communities (Salazar and Cascante 2011).

The importance of play is acknowledged by other significant authors in addition to Sennet in this thesis. Engeström points out that “learning activity has much of the quality of play” (Engeström 2014, 100), and McLuhan on the other hand, emphasizes the importance of play embedded as a ritualistic representation of a participative kind. Not the Industrial Revolution, but another bureaucracy is pointed to by McLuhan as one of the responsible elements in relation to our suppressed nature in playing:

How art became a sort of civilized substitute for magical games and rituals is the story of the detribalization which came with literacy. [...] Even the ritual became more verbal and less mimetic or dance like (McLuhan 1994, 237).

Huizinga’s reflection inspires Thomas and Brown (2010, 328) in *Homo Ludens*. Remembering his lesson, they assert that culture is not what creates play, but the opposite. Human as player is the most important element, since we connect through it to both new media for our natural state of learning, always becoming. The idea of leisure is inherently in their text: in Levy’s terms (2007), something completely different to work and perhaps closer to von Hentig’s ‘Jugendschiffe’ -- overseas, where play, knowing and making come hand in hand. Brown and Douglas presume that the existence of few “spaces” where play is offered as an opportunity is obvious. Just like Dahlbom and Mathiassen in the early ‘90s, they see the missing link in our society of *formal gravity* in a known fact: increasingly we recompense the “fastest growing industry in the twentieth century”, which is “the play industry”



(Dahlbom and Mathiassen 1993, 268)<sup>69</sup>

In such, for Henri Jenkins this becomes an open possibility to be considered, given that the importance of games for the current generation “may represent the best way of tapping a sense of engagement with learning.” (Jenkins et al. 2009, 37.)

As players, we engage intrinsically in learning environments where naturally, our motivation is exploring not only because of a *telos*, but also because by opening our *imagination* to possibilities and tryouts we explore continuously, in it already an end, but most important, we negotiate and make meaning in flux. In this sense, Brown and Douglas point out that by playing, *Homo Ludens* leaps into the uncertainty of “insufficient information to reach conclusions” exactly as we solve riddles.

For them, the riddle is “one’s way through a mystery” (Thomas and Brown 2010, 329), which for me, matches von Glasersfeld’s idea when early in his work, he speaks of the “mysterious” act of reflection. Later on, he directly approaches this issue talking about the choices of tasks at school, as it “requires the teacher to use imagination rather than routine” (von Glasersfeld 1996, 183).

For Marshall McLuhan, the topic of games is very meaningful as he dedicates an entire chapter of his book to it. In “*Games: The Extensions of Man*”, he offers an exercise of contrasts. As I indicated previously, he blames literacy for the “detrivialization” of society, viewing it with a sense of uneasiness since “a man or society without games is one sunk in the zombie trance of the automation” (McLuhan 1994, 238).

However, his analysis also embraces the perspective of games as mediums for extension, this time avoiding a negative connotation directly. Yet, even in this consideration, he provides us with a positive hint of interest to my argument. Just like with art he says, games are “translators of experience” able to “shift familiar experience into new forms, giving the bleak and the bleak side of things sudden luminosity” (McLuhan 1994, 242).

These characteristics are shared with the understanding of *metaphors* presented in this thesis. It is the same interpretation one can make from Jenkins’ idea, where he correlates games with »simulation« and ‘performance’ (Jenkins et al. 2009, 41). Despite the fact that in their text, the topic isn’t mainly addressed to space at higher education, what becomes interesting is their concept of *simulations* as metaphors, since they allow people to contend “with large bodies of information” to experiment in the presence of altering variables (ibid., 41), but also to promote the “process of modeling, which is central to the way modern science operates” (ibid., 43).

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<sup>69</sup> Video games are recognized to be influential for new debate. By the year 2015, its market section has shown high-income numbers for developers. For instance, the controversial *Gran Theft Auto V* (an open-world, action video-game criticized because of its portrayal of violence and chauvinist scenes) reported one billion dollars in sales just after three days in stores. (Goldfarb 2013).

Assuming this perspective, by playing we dive into the uncertainty of incomplete riddles. It is an activity of constant change just like in metaphors, instances of a same class. In this idea we not only meet the revolutionary character of the algorithmic sign, but as well, the organic spirit of a world of constant change.

Man only plays when in the full meaning of the word he is a man, and he is only completely a man when he plays. (Schiller, 1795)<sup>70</sup>

Reflecting on the portraits of animal laborans, Homo Faber, Homo Sapiens and Homo Ludens, certain ideas have arisen in connection with the idea of “context” and the growing importance it has within human learning. In times of post-media, it has also been agreed that context is assumed as ‘space’. Yet, this concept hasn’t been addressed properly. In the upcoming section I proceed with this task.

### 3.6.1. Space

And day by day upon the shore I stand,  
My soul still seeking for the land of Greece.  
(Goethe 2014, 3)<sup>71</sup>

Human beings are defined by ‘space’. Wars take place in its name, poetry is written after it. Other times, we share it or simply lack it. They talk about it in the news, but because of different reasons, we often do not pay much attention. “*Time is money*“, goes the saying. What about *space*?

To delve further, in this section I feature prominently Otto Friedrich Bollnow and his anthropological pedagogy as a backbone reference. In his 1963 book *Mensch und Raum*<sup>72</sup>, the term is explored within a rich network of considerations that are of immediate relevance to the case I present.

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<sup>70</sup> The original quote is “...der Mensch spielt nur, wo er in voller Bedeutung des Worts Mensch ist, und er ist nur da ganz Mensch, wo er spielt. [...]” (Über die ästhetische Erziehung des Menschen, Schiller, 2009)

<sup>71</sup> The original quote comes from the play *Iphigenie auf Tauris*, written by Goethe and first published in 1787. “Und an dem Ufer steh ich lange Tage, das Land der Griechen mit der Seele suchend”

<sup>72</sup> The book has been translated as “Human space” only until 2011. Before that, this text remained exclusively in its original German version. Admittedly, the editorial section states that because of the relevance of certain concepts presented in the textbook, some words are kept in the German version as conceived in 1963 to avoid any translation inaccuracy. In return, each of the words offered still in German carry with them a mindful description of the meanings in combination with a textual context in what could be an English equivalent. I find this feature particularly relevant, specially because such problems have already caused issues with important pieces of literature (see von Glasersfeld 1996, 94) on his discussion about the concepts “Vorstellung” and “Darstellung” in Kant’s transcription). This gesture from the publisher beyond any formal or technical decision grants significance to the sign in its reifying function within specific contexts and topics.

Centuries ago, in times of *Bildung*, *humanism* and *Enlightenment*, we also thought of 'space'. Among different notions, the German culture cherished the Greek experience, their muse to construct a humanistic project.<sup>73</sup> Instead of »space«<sup>74</sup>, the English word, they used the word »Raum«, "an ancient expression of settlers [...] which at first referred to the activity of land clearance and freeing of a wilderness for settlement... then to the place of settlement itself.' This reference is highly significant. Space in this original sense is not already in existence per se, but is created only by human activity, by the clearing of the wilderness (which is therefore not a 'space')" (Bollnow 2011, 34). In view of it, we think of space as something neither empty nor free. Not just that, but also it is important in one of Bollnow's initial statements:

"Human beings are not present in space as an object, let us say, is present in a box, and they are not related to a space as though in the first place there could be anything like a subject without space. Rather, life consists originally in this relationship with space and can therefore not be separated from it even in thought" (Bollnow 2011, 23).

Let us assume two different perspectives. In the first assumption, *space* is something constantly created by bodily entities with their limited physical extensions. It grows or shrinks depending on the contours of material shapes. All units of the world, including us, create space just because of being masses in the material sense. If this is so, this position implies that *all* entities must materially exist to occupy *space*. We *experience* space.

The second scenario may seem familiar to us: it analyzes space as something more or less precise along certain standards. We are able to manage it, predict it, map it and manufacture modifications in hope of solutions. In this kind of space, we are in control. Yet, at times this stance about space can be problematic, say, when there is not *enough space*. This we fix sooner or later. We come up with new pragmatic solutions, efficient. *Digital media* has been one of those, offering a kind of space some call "virtual" and claimed to be unlimited. Following this logic of *measured* space, we could picture a successful farmer who increases the number of cows to milk and, in order to increase his earnings, he is in need of more space to let his cattle graze. Financial systems support this and successfully, he obtains a larger place.

Seeing both approaches, it is clear that our understanding of space varies depending on our

<sup>73</sup> See Nordenbo (2003) for an extended explanation on the importance of ancient Greece in German history.

<sup>74</sup> It is indicated that the term was introduced by Aristotle in his book *Physics*. In it, the philosopher used 'topos' [τ ό π ο ς] (as the parallel for 'chronos' [X ρ ό ν ο ς]), traditionally the concept used and translated as space. However, this word can be also translated as "place", problematic because of its ambiguity (Bollnow 2011, 29).

viewpoint. To think of space as a *mathematical* category –explained Bollnow– is to conceive space as an abstract phenomenon “that can be measured in three dimensions, in metres and centimetres” (Bollnow 2011, 17). In my view, and in order to create an extended argument fruitful to this thesis, I suggest thinking in terms of that which is “measurable”. Then it wouldn’t be strictly calculations of things in three dimensions, or meters and centimeters; but also all those spaces in *any* unit system, – e.g. length, image resolution, digital information, number of characters.

The consideration in this approach is that no matter how much we try or want, there is also a dimension of *finiteness* of this space we skillfully administrate. Our virtual environments aren’t fit to match our corporeal nature and because of certain conditions, people in given places on earth are now paying more attention to space than before.

In their case, »experienced space« is unavoidable. Thinking in terms of population density for example, a person in vast Mongolia, sparsely populated, will need plenty of time to move from one point to another in order to meet his nearest neighbour; whereas in overpopulated Bangladesh your living conditions would be probably different, since your neighbour may be sharing a limited space with you in a same room. This may explain the suggestion why time, infinite and speculative, is money. Finite property in experienced space belongs to the domain of the senses, of that which is natural and indomitable.

A traditional approach would introduce space as “a continuous area or expanse, which is free, available, or unoccupied: ‘a table took up much of the space’; an area of land which is not occupied by buildings” (Oxford Dictionary 2013). Here, it is clear that space is understood with a mathematical approach: free, a continuous area out there, waiting to be overtaken by buildings. Relevant in Bollnow’s approach is that he presents the idea of *experienced space* intimately linked to a world of recurrent actions, a kind of space being actively constructed.

The following explanation is fundamental to this thesis, because what Bollnow does is to conceptualize the term space using “‘chóra’ (χώρα), which itself comes from ‘choreo’ (χωρέω), which means primarily to give room, to make space, then, more generally, to give way, to shrink back, and in particular with reference to vessels: to hold something, to have room to receive something” (Bollnow 2011, 30).

This definition is fundamental, because what he avoids is Aristotle’s term *topos* (τόπος), the traditional word that “is mostly translated in versions of Aristotle, as ‘space’”. It is indicated that the use of ‘topos’ is problematic as it can be translated as *space*, but equally *place*. While in ‘topos’, “places necessarily lie side by side”, and with ‘chóra’ “space can lie within each other, the smaller space within the larger, surrounding space” (Bollnow 2011, 31). With this in mind, in ‘chóra’ we turn our eyes

towards the material essence, where we can experience space by *shrinking back or expanding with movements*.

Instead of pursuing *infinity*<sup>75</sup>, a mathematical approach<sup>76</sup> developed centuries later, he underscores the Greek interest in the question “where does something belong?” (Bollnow 2011, 31). This being the case, I can clarify now that in this thesis I do not analyze the construction of *places* of learning, because this would suggest that learning is something constrainable. I analyze the construction of the *space* of learning, embracing the nature in learning, uncontrollable and actively experienced. In the light of this clarification, a classroom is conceptualized as the *place* designed to contain the *space* of learning of students, just as the space of learning experienced by a ‘Geselle’ is as big as his ‘Wanderjahre’.

*Experienced space* stands for the “actual concrete space in which our life takes place” (Bollnow 2011, 19). Notice that Bollnow borrows two key descriptives: *actuality*<sup>77</sup> and *concrete*. In other words, this is a kind of space that is not mediated, but material and bodily. Bollnow clarifies that for him, *lived space* [erlebter Raum] would be a better representation to use “as it expresses no psychological meaning, but refers to space itself, and in so far as humans live in it and with it, to space as medium of human life” (Bollnow 2011, 19). The author prefers to stick with the first one because “the term is linguistically correct, although factually less apt and more easily misunderstood [...] for it seems to me inadmissible to infringe the laws of language, even for the sake of greater clarity” (ibid., 20).

For him, the term does not stand for any interrelation of objects but an object in itself is space, “the hollow space bounded by a surrounding cover, and therefore necessarily exactly as large as the thing that takes it up” (ibid., 30). To further clarify the notion of *experienced space*, Elliot Gaines offers a relevant reflection:

“the frontiers of space begin with the body of an individual subject. The physical limits of the body and its means of conscious perception, through sight, sound, smell, taste, touch and the reasoning mind, all engage in identifying the meanings of the

<sup>75</sup> There is one exception that Bollnow mentions in his text. He talks of the “problem of infinity” and while he remembers that experienced space is of a finite kind, he acknowledges that “only through subsequent experience does it open up to an infinite extent.” (Bollnow 2011, 19) This could be interpreted close to Engeström’s idea on “developmental transfer” or in Thomas and Seely’s central thesis of “becoming”. This activeness is related equally to the idea of Barnett on “*being* a university”.

<sup>76</sup> There is also a long analysis presented by McLuhan in his chapter entitled *Number: Profile of the Crowd*. There, he claims our natural act of reckoning (see p.50) was deeply transformed. “It was not till the thirteenth century that sifr, the Arab word for “gap” or “empty,” was Latinized and added to our culture as “cipher” (ziphirum) and finally became the Italian zero. Zero really meant a positional gap. It did not acquire the indispensable quality of “infinity” until the rise of perspective and “vanishing point” in Renaissance painting.” (McLuhan 1994, 115).

<sup>77</sup> I discussed the idea of actual experience, see p.48

things in the world of experience” (Gaines 2006, 174).

Alternatively, we can understand this relation between *experienced spaces* and *learning spaces* using another metaphor and therefore think of it in terms of *design*. It is known that when we design, we specify a sequence with a purpose. It is “the art or action of conceiving of and producing a plan or drawing of something before it is made” (Oxford Dictionary 2013). Complementarily, John Maeda (1966 – ) provides an interesting hint for this idea stating that “design is everywhere, however, it only goes away when we go into the forest” (Maeda 2013b). In his definition, I find a connecting path to Bollnow’s meaning of ‘Raum’ (space), when he compared it to *removal* of the *wild* [aufräumen]. The premise is that whenever I create a design, I take *nature* (as in the forest) away.

On the other hand, all spaces of learning – like designs – are purposeful sequences. They follow a plan which was previously produced and at a later moment, they are implemented. The presumption is that whenever I create a space of learning, I take *lived spaces* away from these individuals attending a classroom. Our bureaucratic structure of higher education (e.g. curriculum, syllabus, evaluation, semester schedule, classes, professor, student) deprives us of all other spaces and installs itself as a central figure. The promise is that whatever we offer in these artificial spaces, it will provide students with enough knowledge to get integrated into most of those deprived spaces for the first time. The class becomes something like the “headquarters”, from where you get most of the instruments necessary to apply in other dependencies.

A pedagogue like Harmut von Hentig heads in a different direction. In his proposal about *service learning*, it is valuable to notice that his metaphor of *Youthships* was just one instance among many possible scenarios he offers in his argument. This could comply with an interest in decentralizing formative actions away from school as the “headquarter”, but closer to the *experienced space* in the *actual concrete arena* of events. In five different areas, he identifies recipients of actions for such a program to exist: environment, social service for the disadvantages, the sick, the elderly, children; services for the city, landscape management; in politics, and international operations (Hentig 2006, 51 own translation)<sup>78</sup>. In contraposition, the author honors learning in terms of space, setting clear his position on the current model that favours development with a certain speed:

Increasingly, intricate technical and social systems affect everyday life in our society. The development is enormously accelerated: we aren’t able to cope with the accumulation of resources and the acceleration of changes (Hentig 2006, 70)<sup>79</sup>.

<sup>78</sup> Sie können auf fünf verschiedenen Gebieten geleistet werden: im Umweltschutz; in der Fürsorge für Bedürftige, Kranke, Alte, Kinder; in der Stadt - und Landschaftspflege; in der Politik; in internationalen Einsätzen.

<sup>79</sup> Immer komplexere technische und soziale Systeme bestimmen den Alltag unserer Gesellschaft. Die Entwicklung beschleunigt sich enorm: Wir kommen mit der Akkumulation der Mittel und der Akzeleration des Wandels nicht mehr mit.

Consistent with Bollnow's *experienced space*, von Glasersfeld's explanation on how humans come to perceive (see p.89) has noticeable similarities in its approach. Starting from his idea of an *experiential interface*, von Glasersfeld confers utmost importance on *sensorimotor* capacities, for they are fundamental to obtaining data and information to construct knowledge. He explains that by moving and measuring in space and time, we come to map this experience. We alone can do this, "and no explanation that relies on them can transcend our experiential world" (von Glasersfeld 1996, 74). In his terms, the *experienced space* as the medium becomes crucial, because our perception of the world happens exclusively through our physical senses, but our motion also influences constantly our precepts (von Glasersfeld 1996, 95). All this signals that we will end up being the raw material for further mind processes.

To clarify further, Bollnow presents other terms that are associated with space [Raum]. By explaining their differences, he mentions terms such as location [Ort], position [Stelle] and room or place [Platz]. But in order to settle the crucial difference between place ('topos') and space ('chóra'), the author describes a perspective in terms of the *experienced space*, that is, in relation to the human creating space with his body.

In *place* a freed area is declared, created artificially and limited to fit something, whereas *space* not only comprises the freed area that is now occupied by the mass within the contour of a unit, but also adapts to the movement of constant change. It becomes as big as the bodily entity expands. In this sense, despite the fact that 'chóra' does not pursue infinity – which is the illusion that was adopted in the mathematical approach of place –, "it can be opened up to an infinite extent" with its changing and extending mass (Bollnow 2011, 43). Acknowledging this understanding, learning is space; if place, then limited and caged away from *lived spaces*. This last differentiation is an important debate to undertake in benefit of our spaces of learning at higher education.

A final reflection worthy to embrace takes us back to Aristotle's lesson, for he explored kinds of space out of the directions noted by the human while standing upright. He discussed them in pairs: *above* and *below*, *front* and *back*, *right* and *left* (Bollnow 2011, 45). This concept places our bodily aspect, once again, in the centre of importance and offers a useful hint in terms of our changing nature of perception while *moving in space*.

Yet, Bollnow highlights that among the pairs, *above* and *below* remain the same indifferently of our stance. It is in this point that the author establishes "our first, most straightforward structural principle: vertical axis and horizontal plane together form the simplest system of concrete human space" (ibid., 46), which in other words is how we define (1) the physical space beneath me, totally opaque to my

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perception, to which I am bound to, and on where I move; and (2) the vault of the heaven above me, transparent up to what my limited vision allows (ibid., 47).

These conditions determine a world of semantic values in terms of our limitations. As bipedal bodily entities we can access now this expanse ['Weite'], thus exploring these directions and making sense of the kind of relations that bring us together. We have a *front* of us, where lies the direction towards we are heading, the future and unknown ['Fremde'], while *back* is about the unseen, what is already experienced. The last two, *right* and *left* are eliminated by Bollnow, as for us when moving, what counts is either that to come or the returning. All in all, if we decide to move in space and we do, it is necessary first of all to stop if we want to observe the landscape. "But each time, I must first stand still, that is, interrupt the movement of walking or driving." It is by the double value, still and in movement, that we can create meaning (Bollnow 2011, 51).

Mindful of this scenario, I want to introduce a fourth element to the company of *Homo-Sapiens*, *Homo-Faber* and *Homo-Ludens*. For there, according to Bollnow, is »Homo-Viator«<sup>80</sup>, which emerges from this inevitable condition we have as we move on the earth and while on it, interpret. For *Homo-Viator*, the line that divides what's literal or figurative is blurry. Our body in movement influences my perception of what there is in any direction. *Homo-Viator*, the human as traveler, I present in connection with the importance that Sennet recognizes in the evolutionary turn of the human after acquiring freedom in terms of movement. The freedom of movement while standing upright is another fundamental topic for the evolutionary turn, as mankind accessed a different perspective which allowed us not only to walk the earth differently, but also transform it with our now freed hands (Ingold 2004, 317).

Homo Viator is privileged to explore the *expanse* of the earth surface beyond his sight [Weite]. In Bollnow's sense, this notion is related to someone who is wide-hearted [weitherzig], liberated from mind restrictions, ready to explore. Opposite to him is that one narrow-minded [engerzig] dweller of a limited place who moves inside the legislation (Bollnow 2011, 86). In expanse "man strives towards something outside himself" (ibid., 89). Additionally, *Homo Viator* grows in curiosity for what is distant [Ferne], for something *in front* which is out of his *experienced space* range, most of the times not representable but known to be there.<sup>81</sup> Yet, this curiosity is not amused by that which is foreign [Fremde], opposite to Homo Viator's nature. In front of it, things turn unpleasant and menacing, an element that "shocks us out of our own sense of security" (ibid., 88). In terms of Wenger and his analysis on

<sup>80</sup> Silvia Montiglio remarks that *Homo Viator* as a concept, can be traced back to Greek history. She associates it with the "Stoics and the Neoplatonics", however, its acknowledged by the author that the term as such, wasn't used until medieval times, where they used the terms "viatores" and "viagium" in the sense of "(those who go through) the course of life" (Montiglio 2005, 42).

<sup>81</sup> This human capacity is explained by von Glasersfeld (p.62) as reflective abstraction (von Glasersfeld 1996, 69).



Communities of Practice, a foreigner is granted no degree of ‘membership’ inside a given community.

If we were to design a space of learning worthy of *Homo Viator*, it would have to be open to *expanse*, fit to embrace a world in constant change (Thomas and Brown 2010). In it, *Homo Viator* would be aware always what is home [Heim] and what is distant [Ferne]. A space of learning would stimulate curiosity and miss what is distant to us [Fernweh], allowing always place for *Homo Viator* to be homesick also. In change and contrast happens learning.

### 3.7. WE LIVE, I LEARN

A number of different educational standpoints have been presented. As with every theory in the academic domain, one addresses them within contextual frameworks, clarifying phenomena in nature. This exercise is performed to create meanings, which ultimately will be tested within the social, where we negotiate and validate stances.

As previously suggested, these different perspectives are necessary to tackle the problem presented in this thesis, one of fragmented nature, where multiple instances revolve around one same event: human learning in times of digital media. Assuming a fixated position to explain rapidly changing phenomena may produce blurred interpretations of the world. For this, *metaphors* and ‘boundary objects’ are suggested as “middle ground” to support the necessary *expanse* – in terms of Bollnow and Engeström – in areas such as digital media and higher education.

To delve further, Anna Sfard’s (1998) line of reasoning is suitable as she affirms that “nowadays educational research is caught between two metaphors.” She designates them as the (1) »acquisition metaphor« where we construct and stock knowledge that is later applied, transferred (to a different context), and shared with others (Sfard 1998, 6) and (2) »participation metaphor« –where there is no knowledge but “knowing” (as in Thomas and Brown), associated with “ongoing learning activities” that come only in situated contexts, interested about participating” (ibid., 6). In her second metaphor she discusses some approaches such as “constructivist, social-interactionist, and situationist”.

In her overview, she suggests avoiding the idea of learning in terms of *prescriptions*, as she points out a global tendency that rewards approaches of the kind “many-one” (Laurillard 1993, 2). Additionally, Sfard denounces a “total banishment” of some of the theories located under the umbrella of *participation metaphor*, condemning “theoretical exclusivity and didactic single-mindedness that can be trusted to make even the best of educational ideas fail” (Sfard 1998, 11).

Taking up Sfard’s enthusiasm to consider the *participation metaphor* in our idea of learning, in this section I want to stress the crucial role of being part of “we”, which is fundamental for the exclusive

learning that happens in “I”, that is, each of us as individuals. Within this dualism the spaces for learning and teaching emerge: ongoing scenarios that can be completed only by *becoming social*. To emphasize the social requirement in learning, Etienne Wenger’s ideas will be particularly highlighted along with Star and Griesemer’s discussion that convey fundamental ideas for reflecting on cooperation in fragmented atmospheres.

To illustrate the social perspective of our traditional spaces of learning, I now borrow a metaphor presented by Bollnow in his *Human Space* textbook, which after modifying it, I will refer to as “the classroom as a house” metaphor. What Bollnow does in his original text, is to describe meticulously our house as the human space for intimacy and security. For him, in this familiar space we are sheltered from menacing *foreign* elements in the *outside world*, the same place where the *social* happens and the *distant* find its place (Bollnow 2011, 125).

However, if it weren’t for the existence of windows to look out, or doors permitting a connection with the *outside world* whenever we wanted, this house would turn into a prison (ibid.,147). Similarly, our classrooms are places of safety; unenlightened humans are told that in this place *learning* happens, a relief for them as they feel threatened by their ignorance. They are in need of certain experiences that are required to join specific social processes happening in the *outside world*. Someone who has experienced these social processes comes among them, and teaches about what happens out there. As with Bollnow’s house, this classroom is equipped with doors and windows, otherwise it would turn into a jail.

For our “classroom as a house” metaphor, I evoke four elements presented by Bollnow of interest to complete our reflection. A *key*<sup>82</sup>, the *window*, the *door*, and the *bed* are stressed by the author because they have important functions in terms of how we relate to the *outer world*, where a dialectic tension happens.

The outer space is the space for activity in the world, in which it is always a question of overcoming resistance and defending oneself against an opponent; it is the space of insecurity, of danger and vulnerability (Bollnow 2011, 125).

*Keys* are meant to access places from outside. Yet, they are equally used to lock the door and by that prevent any menace from admittance (Bollnow 2011, 147). Once inside, there are differences to note between windows and doors. A *window* “is interpreted as the eye of the house” (ibid.,151), different from the function of a *door*, which allows a palpable connection to the outer world, always

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<sup>82</sup> In the original text, Bollnow does not make any references in terms of “a key”. He explains it as “the lock” (Bollnow 2011, 148). The element is introduced by me to add narrative coherence.

aware that the world we experience as we step out is different from the one we see through a window, no matter how transparent the glass is (ibid.,153).

Differently, the windows in a classroom aren't so popular, a bit in the fashion of computers. We could imagine one student looking out the window, who sooner or later is asked to pay attention, maybe the same kind of attention that Gernsback believed to achieve by filtering distractions and increasing pure thought with his Isolator (Fig.14) in the early 1920s (Massie and Perry 2002, 266).

For a while this worked, but now we have computers that make us immune to the teacher's reprimand. I discuss this later. Lastly, in our classrooms we are not the only ones permitted to access it. Outside, others have keys which increases potential risks either to getting unpleasant elements among us, or to becoming prisoners if someone outside decided to lock the door.

A last and important feature commented on by Bollnow is related to the bed. This he describes as the "place of ultimate security" and there is no equivalent in the *outside world* to match it. "To understand what it means when a human lies down in a bed, we must first try to grasp what it means when he stands upright" (Bollnow 2011, 161). For him, meaningful places caress humans in security and protection against the foreign. In the case of our spaces of learning at higher education, is there something as valuable as this ultimate security place Bollnow tells us about? Shouldn't they offer an *ultimate* support against the menacing ignorance they are afflicted by?

In the previous metaphor, we may identify a number of possible tensions drawn around the *experienced space* we have at home in comparison with another *experienced space* at the university. Surely they aren't equivalent, but the indications around intimacy and security are common to anyone occupying these two places. However, there is certainly a big challenge for leaders at universities, intending to teach to stimulate the act of learning and for that, offer an arrangement suitable to protect them from dangerous conditions. The call is to remove them from immediate experience in the outer world, and offer them 'academic knowledge' instead.

We must be always careful when our plan of participation is regulated by controlled actions since this may turn people into prisoners of a place. Spaces of learning that follow this approach, rich in control and the "dictatorship of a single ideology" (Sfard 1998, 11) are more likely to have less chances of success, the author warns us. For this, it is useful to be reminded that if Polanyi spoke of *explicit* and *tacit knowledge* of the world, Laurillard identifies two other kinds of knowledge that she defines as »everyday knowledge«, one that is "located in our experience of the world", and »academic knowledge«, which is located in our experience of our experience of the world (Laurillard 1993, 26).

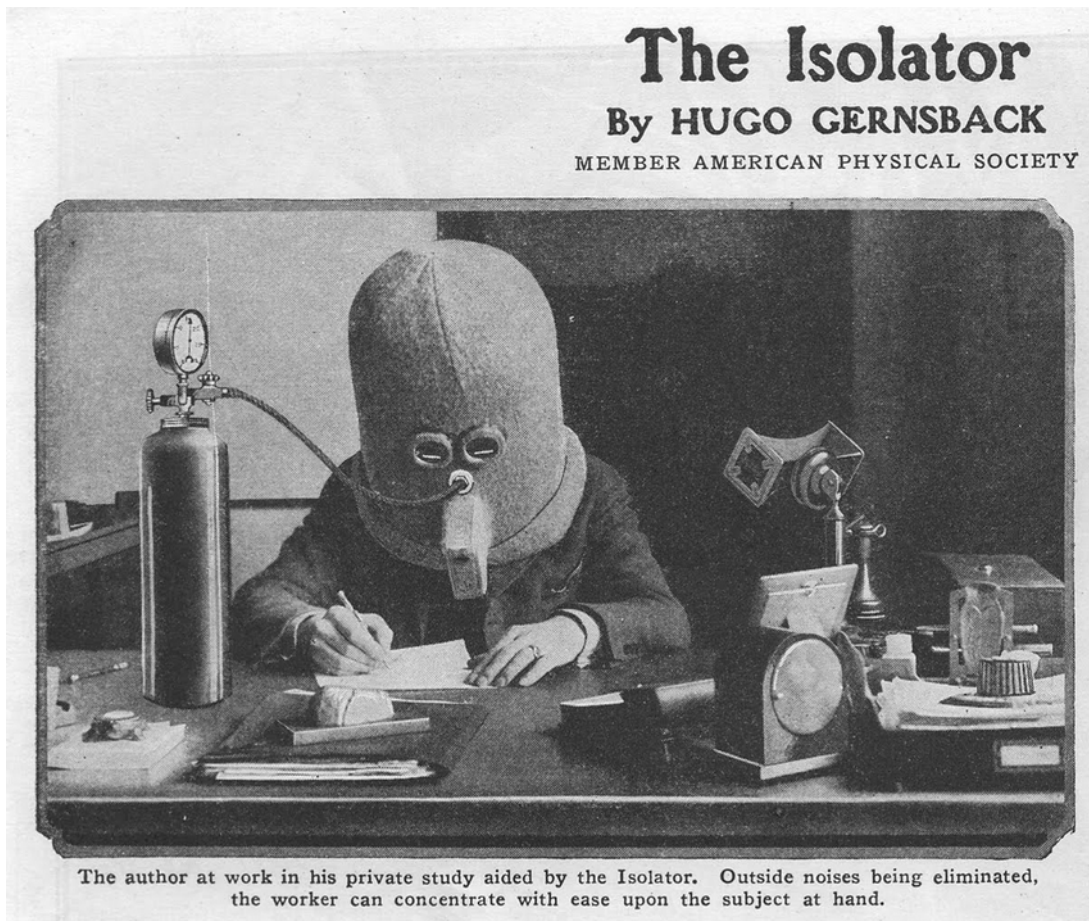


Fig.08. The Isolator, by Hugo Gernsback.

Under this premise with the traditional space of learning at universities we will probably be aiming to influence the *academic knowledge* of students, a level which is not at all complete nor significant for their everyday knowledge. Academic knowledge is deprived of the outer world where activity is. Homo Faber wouldn't be able to engage itself, since we would be approaching what Laurillard calls a "second-level order of 'reflecting on' experience" (ibid., 26).

But how will my *experienced space* in the classroom be connected to my *experienced space* in the everyday? What kind of space of learning takes place in the outer world? We certainly know there is something happening outdoors. While being safe at home and drinking our morning coffee, I take my *Windows operative system* computer to access a "live" video where images of people represent a bodily manifestation against organized forces in the middle of some known city.

Other times at the university, I sneak a look through the window just to place my eyes on a group of construction workers diligently fixing some weird devices I have never seen in my life. Then I listen

again to an overexcited professor, who tries hard to explain the reality of the job market out there. There are all sorts of evidences that insist on the social, and that activities are out there. For Jenkins & Co, their main thesis is to explain participation bound to digital media, but following an “ecological approach”, which refers to structures that ratify the interrelationships of elements.

Jenkins’ et al. (2009) ideas aren’t that far from the spirit that moved the »Scandinavian approach« for instance, where designers in the late 1970s and ‘80s “emphasized the political nature of the gap between the users and the designer” (Berg 1998, 459) and their struggle was to defy the management-centered nature of system designs at that time. Their idea was to invite the ‘user’ to participate through “a democratic perspective emphasizing open dialogue and active user participation” (Ehn 2002, 19). It should be clear by now; their effort was of a political kind.

To accomplish their vision, participation played a key role that has special emphasis on *learning* as they refuse to “design systems to fit people” and instead, open themselves as a community of practice to empower “people to design their own systems themselves” (Bødker et al. 2000, 7). This effort shares major similarities with the *makers movement* according to Gershenfeld (Edge 2015). Furthermore, Jenkins et al. (2009) declare prominently the intimate relation between learning and participation, however their focus doesn’t favour the formal fashion of education, but the idea of “informal learning communities”. In their words:

Informal learning communities can evolve to respond to short-term needs and temporary interests, whereas the institutions supporting public education have changed little despite decades of school reform. Informal learning communities are ad hoc and localized; formal educational communities are bureaucratic and increasingly national in scope. We can move in and out of informal learning communities if they fail to meet our needs; we enjoy no such mobility in our relations to formal education (Jenkins et al. 2009, 11).

Mindful that my idea on learning deals directly with the social element of everyday life, where the formal and the informal are equally present, I share Wenger’s belief that knowledge must be directly related to three different factors: the social, our meaningful enterprises (or activities) and the active engagement we undertake while being in the world, creating meanings (Wenger 2000, 4). For this, we need to study the case of »communities of practice«, a concept offered by Etienne Wenger which is another important viewpoint that I embrace for the analysis of my thesis.

A community of practice takes place in our everyday lives, and tends to be informal and is rarely explicit (Wenger 2000, 7). Looking it this way, one does not decide to “start” a new community,

network or net of persons. Communities happen naturally, and are active groups that come together because there is a shared common interest. Other times it's about shared questions. Wenger acknowledges that his perspective is constructed between a *social learning theory* and a *situated learning theory*.

A community of learning is considered to be a design of »learning as participation«. On the one hand, it involves the importance of "local actions and interactions" to be found in the situated action, and on the other hand it appreciates the lesson of *social theories of learning*, where one engages profoundly in culture and history. Being in the middle, Wenger proposes *learning as participation* as it "reproduces and transforms the social structure in which it takes place" (Wenger 2000, 12).

Once again, I indicate the emphasis on the idea of the *informal*, not as a category but that the kind of learning described in this category is crucial, something clear for Marsick and Volpe as they see it "unstructured, experiential, and non-institutional. Informal learning takes place as people go about their daily activities at work or in other spheres of life. It is driven by people's choices, preferences, and intentions" (Marsick and Volpe 1999, 4). These are precisely the conditions that spark movement and thirst of learning in the 'Geselle'.

A *practice* is an enterprise we engage in naturally, and while interacting with others to improve the way we face this enterprise, sequences of actions are tuned to different elements around, next to and inside us. This is why for Wenger, practicing is also learning (Wenger 2000, 45). As we *extend*<sup>83</sup> in sequences of shared enterprises with others, who at the same time, are engaged to them in different ways, we become a community of *practice*.

Because of our sustained engagement with an enterprise, we develop levels of proficiency in the approaches to how we deal with this activity. This creates within the community a sense of property (ibid.,45), that is, taking part becomes a reference for that which is an enigma for someone who hasn't engaged in it before. While belonging to communities of practice and because we get so experienced at dealing with these enterprises, we find new ways to go deeper in our cognitive processes, something explained by Wenger as a »trajectory«, which is constituted by this historical sequence of participations for each member of a community.

Soon enough, reflection becomes important to our practices, once our operational layer is mastered in the iterative sequence during everyday situations. Furthermore, in being engaged with others we create knowledge about these sets of elements and practices that come together in shared harmony,

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<sup>83</sup> Bollnow's concept of *expanse* comes into good use to complement this idea. In Wenger's text, he points out that "over time, this collective learning results in practices" (Wenger 2000, 45), but in my mind, this should be understood not merely as actions that are performed for more or less time, as this does not imply any attitudinal development in the individual. *Expanse* on the other hand, implicates the *experienced space*, which complements a richer understanding of the individual in the outer world.

including the interaction we maintain with other members. For Wenger, this is defined as the »repertoire« of a community, which comprises different components that belong to the *tacit* – e.g. subtle cues, recognizable intuitions – and the *explicit* – e.g. tools, representations, roles, procedures. As with Sennet, *practice* is presented as something integral that comes with cognition. It is active, as with Thomas and Brown, because we do “both acting and knowing at once” (ibid., 48). This is described by Sennet, Lave and Ingold as craftsmanship.

A second fundamental concept presented by Wenger has to do with »negotiation of meaning«, an idea acknowledged by von Glasersfeld to an “apt description” of the procedures that involve *accommodation*, this as we construct our unique model of the world (von Glasersfeld 1996, 191). For Wenger, “living is a constant process of negotiation of meaning” (Wenger 2000, 53) as we make use of different faculties such as reflection (a negotiation with our own history), and out of it we ‘reify’ something anew that eventually reaches interrelations of communities of practice. When our process of reification manifests as an object or sign, it can be presented in a community of practice in order to share –or not– an agreement. However, it can also be of good use to create new relations, or to reconsider what we had and modify it at will.

The negotiation of meaning takes place in two processes: participation –which is closer to intuition– and »reification«, closer to formalization. When we reify something, we are “giving form to our experience by producing objects that congeal this experience into “thingness” (Wenger 2000, 58). While I participate, there is mutuality because I interact with another one like me<sup>84</sup>, but when I am reifying, there is a projection produced by myself but “not having to recognize ourselves in those projections, we attribute to our meanings an independent existence” (ibid., 58).

This combined action is fundamental to our practices in communities of practice, because now we conceive within this scenario a plethora of elements necessary to satisfy our profiles as *Homo Multus* and *Homo Fluxus*. Reification refers strongly to our *experienced space* as *Homo Sapiens*, which is one and correlated to *Homo Faber*, the maker that thinks and participates, immersed in experiences around enterprises naturally shared with others who join in and become social to find strategies. In *Homo Ludens* we find the imaginative being, accepting the open invitation to ‘confabulate’ and create things anew, out of intuition, shared with others and performing them with every possible code available, creating new riddles out of questions that start with a “*what if?*”

It is fundamental to understand that for Wenger, “meaning exists neither in us, nor in the world, but in the dynamic relation of living in the world” (Wenger 2000, 54). Despite the fact that Wenger does

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<sup>84</sup> Wenger denies the possibility of considering *computers* in relation to participation at communities of practice. This could be well explained approaching the *family* categorization, as in the dialectics of reciprocal interaction presented by Habermas

not give exclusivity to language as the primary tool we use to exercise our ideas, he grants it prominence. Words are evanescent and for that participation is necessary, this characteristic “makes conversations such a powerful form of communication” something fundamental for interweaving reification and participation (ibid., 62).

This means that in order to pair the historical (reify something from experienced material) with interaction (immediacy and activeness), we perform as we reflect and converse. Yet, I propose the concept »confabulation«<sup>85</sup> complementary to this endeavour, as it introduces the importance of the ludic, that which is new or even close to the inexistent.

To illustrate this claim, we can see the difference between the signs used in a song’s lyrics and the ones used in a computer program. In a song, the words’ meanings are fulfilled by the listener, just how Duchamp referred to the creative act (see p.37). There is something missing that is mysterious, a brain-teaser that needs to be interpreted as when one listens to a melody. Different is when I create an algorithmic sign and enter it into a computer. These automata will compute this sign in an absolute, literal way. A machine has no intuition; therefore, it is unable to participate because of its incapacity to reify a sign in Wenger’s terms. On the difference between reifying and participating, constructing and intuiting, Nike offers a crisp reflection:

We all seem to have some sort of experienced understanding of construction and intuition. [...] We may see construction as that kind of human activity where we are pretty sure of the next steps and procedures. Intuition may be a name for an aspect of human activity about which we are not so sure. [...] Construction stands for the

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<sup>85</sup> The term confabulation has latin origins from *confabulat-* ‘chatted together’, and from the verb *confabulari*, from *con-* ‘together’ + *fabulari* (from *fabula* ‘fable’) (Oxford Dictionary 2013). It is presented to reinforce my interest on ‘boundary objects’ in this case a converging concept in the meadows in between fields. A known term in psychology, it is defined as “the production of fabricated, distorted or misinterpreted memories about one’s self or the world without the conscious intention to deceive”, it is suggested to be a disorder not only driven by the unavailability to “retrieve events in their appropriate temporal context” but as well emotionally biased (Fotopoulou, Conway, and Solms 2007, 2180). It becomes interesting to note that close to this approach, Wenger’s idea of reification is described as a “source of remembering and forgetting” (Wenger 2000, 88). However, it seems that this term becomes profitable for some authors in the field of HCI (True, Peeters, and Fallman 2013) in the sense that they talk of “confabulate” in the time of transdisciplinarity. Their statement first of all, demonstrated that the education of design is fundamental for “education shapes designers and those designers shape the world” (ibid., 134). Lacking a method to promote this in a cohesive or inclusive manner, they are just “scratching the surface with this study and encourage others to share perspectives with the hope of starting a constructive conversation within the field” (ibid., 134). Another line of research that deals with the concept is the computational realm. In a recent paper, Thaler (2013) describes the “Creativity Machine Paradigm”. This is a computational model proposed to explain “creativity” after confabulation, “the failure of biological neural networks to reconstruct memories of direct experience when exposed to nature’s ubiquitous disordering effects, as other “wetware” opportunistically exploits such mistakes and pragmatically perfects the underlying network flaws” (Thaler 2013, 447).



systematic aspects of work we do; intuition for the immediate, non-considerate, and it spontaneous. Both are important and necessary for creation (Nake 2012, 92).

So far, we have a general configuration of communities of practice. They emerge naturally, being part of our everyday lives. Human enterprises become a reunion point, these are shared among humans who engage in different ways, collaborating, being social, sharing, reflecting on they are doing, confabulating, and negotiating meanings. They achieve this by reification processes, where individuals produce tokens that aren't always concrete material objects, enough to provide others with hints of our exclusive meanings. With reifications we may trigger active participation, something that happens when humans recognize themselves in mutual ways, yet this characteristic doesn't "entail equality or respect" (Wenger 2000, 56). What are the elements around these differences in our roles within a community of practice?

For Wenger, »mutual engagement« defines communities, and has to do with the activeness of participants and how they share practices. There are communities for instance, where the efficiency to get their tasks done is what defines their 'membership' –an academic being accepted because of the quantity of papers published–, whereas in other places, the dimension that becomes significant is bound to informal topics that aren't relevant to the shared enterprise –the funny student in class making ironic remarks about the professor in front of the class–.

The nature of the enterprise will be the ruling element for how members of a community will behave, unaware of any "outside mandate" (Wenger 2000, 80). This should be strongly connected to the concept of "motivation", an element that many think (for example at schools) can be managed, increased, and injected into people.

»Membership« refers to our role in communities of practice, and before even thinking of the particular roles noted by Wenger, it is important to be aware that according to the idea of a world of change (Thomas and Brown 2010) it is noted that in communities of practice "people move in and out". This is an important issue because it implicitly means that a "long-lived practice" of people is always replaced with new members (Wenger 2000, 99).

A participant member who remains or approaches the "core" of the community, is a full member, dedicated to the community. Other times members are in need of »legitimacy«, which in the case of a newcomer is fundamental for his process of integration (ibid., 101). This is explained as the initiation of someone joining, with the potential of becoming a full member. This task is carried out by older members who share what is considered important. This is how a community finds its basic elements around practice.

It can now be seen that the structure of any practice draws a *boundary* which determines “ways of maintaining connections with the rest of the world” (ibid., 103) and certainly, with other communities of practice. It also serves to determine who intruders (foreign elements) are, that is when someone is not playing any role or part in a community. In the case of our everyday lives, it is clear that our enterprises and practices are altering scenarios and we hold different memberships, which implies that communities are connected to each other in different ways through us. For this Wenger presents two fundamental ideas referring to types of boundary connections: »boundary object« and »brokering«.

A boundary object is defined by Wenger as forms of reification around which communities practice and organize their interconnections (Wenger 2000, 105). The concept is a powerful idea in terms of higher education; for instance, it is fundamental because we find the potential for a bridging device which is neutral and does not have to be related to a common practice in order to create connections (ibid., 107).

The terms were originally introduced in 1989 by Susan Leigh Star and James R. Griesemer. In their proposal, the term emerged as part of a model developed during a heterogeneous scientific work at the Museum of Vertebrate Zoology at the University of California, Berkeley. Due to a diverse environment of actors and viewpoints, an unavoidable tension between scientific actions took place specially out of their different disciplines, where generalized findings were requested.

In their model they explained two major activities that were implemented within the model. On the one hand, a strategy for standardization of methods was necessary, but next to it boundary objects were formalized in order to allow common platforms for different identities. For their implementation, they embraced an ecological approach in order to leave aside any epistemological primacy in their model. In their words:

“Boundary objects. This is an analytic concept of those scientific objects which both inhabit several intersecting social worlds [...] and satisfy the informational requirements of each of them. Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation” (Star and Griesemer 1989, 393).

They saw in scientific publications for example, a case of boundary object because of its obligatory nature to most academics. But not just that, their attempt went further to categorize them in four different types (Star and Griesemer 1989, 410):

(1) Repositories are collections of indexed objects after a known standard. Each object with free purpose and use since they are constructed in favour of heterogeneity. A digital archive such as the Internet Archive<sup>86</sup> is an instance of repository.

(2) An ideal type is an abstracted description to orient and/or inform anyone. A park signage system or The International System of Typographic Picture Education (Isotype) are examples for this second category.

(3) Coincident boundaries are objects that offer multiple levels of data aggregation but are limited by the same boundaries. Arduino, an open-source electronic platform –software and hardware–, is an example of this type of boundary object.

(4) Standardized forms are “immutable objects”, after Latours’ term, that offer a grid or protocol for people to collect data and information and “pour” it into known and shared vessels. An example of this category is an interview guide.

Next to it, Wenger (2000, 107) proposed four different categories of boundary objects. For him, (a) modularity is *a newspaper* for instance, thinking of boundary objects as fragmented units, where different perspectives pick one; (b) abstraction is *a map with indications of distance and altitude*, where the properties of the object are common to all perspectives; (c) accommodation is *a multi-purpose gym*, where there are many different practices, with director’s office, marketing experts and finally as (d) standardization, *as a questionnaire apt for many*, where the content of the object is formatted to be understood by many.

The other type of relation between communities presented by Wenger is *brokering*. It is offered when a community of practice is presented with “new ideas, new interests, new styles, and new revelations into their clique” Wenger (2000, 109). In this sense, he emphasizes this figure as important, because a *broker* –that one who assumes brokering actions within a community–, is always able to create connections and engage in “import-export” tasks, and so would rather stay at the boundaries of many practices than move to the core of any one practice (ibid., 109). This, as I explain later, is one main feature for teachers building an educational system.

But following closely the characteristics of *brokers*, we could presume that their actions are beneficial for frames such as *activity theory*. There, they could be able deal with processes such as

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<sup>86</sup> It is a non-profit project dedicated to building a library of digital nature, including books, movies, software and music. One can use it without payment requirement. <https://archive.org/index.php>

*developmental transfer*, keeping up the constant expansion of activities in-between. In structural terms, it may be that their profile acquires noteworthiness to connect, let's say, an isolated lecture hall and work. There, brokers would be delegates to find or construct an *interface* between both scenarios in order for them to come "together find and create mutually relevant projects in which both benefit from collaboration" (Tuomi-Gröhn and Engeström 2003, 4). However, with this possibility, recall my opening discussion in Chapter 3 where I raised some ideas on the historical divide between *Two Cultures*. In so many ways it has been confronted since decades already but coincidentally, today we speak –still– of a joined effort as we jump into the wagon of 'multi-', 'inter-' or even 'trans-' concepts.

In need of reconciling this historical divide, sectors such as higher education maintain an important effort to find ways to bridge that which wasn't broken into pieces. Critically, we should keep in mind the important work of Michael Gibbons (1994), where he exposes the problem of 'transdisciplinarity'. For him, this is held in high esteem all over the world; but looking at it closely, many of the initiatives that were "thought to be inter- or transdisciplinary in reality amount to a mere accumulation of knowledge supplied from more than one discipline" (Gibbons et al. 1994, 27).

This could be interpreted closer to Wenger when he explains that it is required for visitors to "background" their home membership in order to advance the boundary relation and maximize exposure to or influence on the practice of the visited community" (Wenger 2000, 112), a scene that is comparable to that moment when a novel knowledge field at a university enters into discussion with another community, which is older in that set of practices.

This "background" I suggest, could be interpreted as our "home" in terms of Bollnow, where we are secure as we own something of value, a treasure of high intimacy like the *experienced space* in our beds. This background is our reference point, which indicates that we can be good at 'transdisciplinary' only if we are good at our own disciplinary approach. You cannot maintain a distance from something, if you never got to the point that you got away from it. You must be first disciplinary, not just being there but also being involved. Your being there makes you aware when it is not necessary to be there anymore because it is now your property and needs fertile ground as it expands. You transcend a discipline then, transcending the condition of disciplines. 'Interdisciplinary' in comparison, is only about sticking to disciplines, and precisely Gibbon`s point.

All these previous concepts, placing special emphasis on Wenger's Communities of Practice, play an important role in upcoming sections of the thesis. For me, they are already "boundary objects", because they are elastic enough to adapt to given structures within society, and most importantly, because they attempt to raise questions about the space of higher education. But beyond Wenger, it can be argued that his ideas are shared by a new generation of academics concern about an

educational turn.

Our design of society, where fragmented scenarios fit an artificial vision created by humans in order to accomplish standards and precision, challenges the idea of a next step to improve this condition. With perspectives such as *Connected Learning* (Ito et al. 2013), new debates are proposed, focusing on the importance of approaches like it, basing actions on four design principles: (1) everyone can participate, (2) learning happens by doing, (3) challenge is constant and (4) everything is interconnected. On top of that, core properties interconnected to the model are presented to come up with learning scenarios that integrate and offer people new spaces, not caring about ages, group affiliations or specific interests to participate.

As part of these three core properties promoted within its framework –*production-centered*, *shared-purpose* and *openly networked*–, the “shared purpose” axis favours what is in my opinion a necessary feature to take into account whenever an educational space is considered. A community, in the sense of Wenger, is a cross-generational and cross-cultural collection of persons who gather to “unfold and thrive around common goals and interests,’ just the way it happens when projects with collective goals are introduced, collaborations and competitions” (Ito et al. 2013, 74).

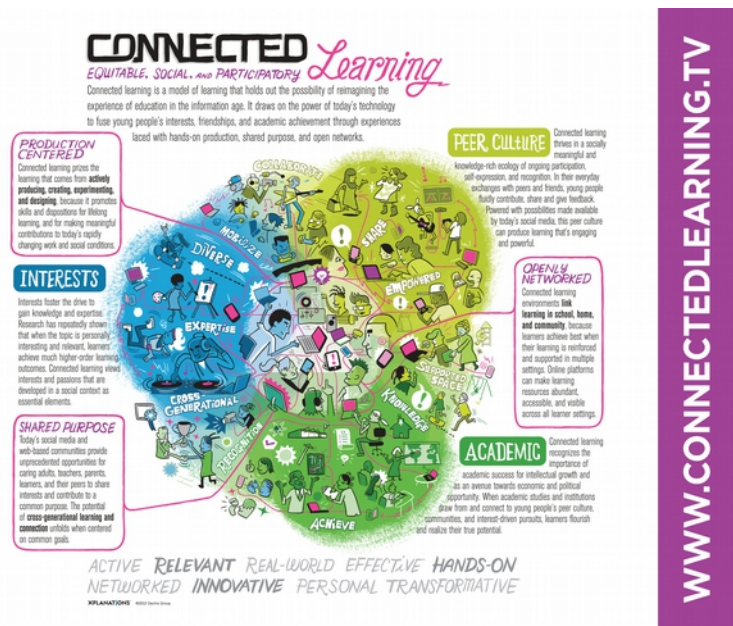


Fig.09. Connected Learning approach (taken from <http://connectedlearning.tv>)

In this section, we have learned about the “imperative” nature of the social. However, it is important to remember that our social nature cannot happen without our individual capability, the vocation we have to be active and engaged. In the middle of this, dynamic meaning emerges: a product of our natural curiosity to explain the world. For this we create meaningful signs, all of them ephemeral and

rooted directly in the values we as a culture determine. But any meaning, and any interpretation we make out of them, is meaningless and blurred in the absence of culture.

This is the message Schmandt-Besserat (1997, 90) points out in her anthropological study as she indicates that “when a culture vanishes, the symbols left behind become enigmatic, for there is no longer anyone initiated into their significance.” This dual relation, the social and the individual, is according to Nake (2008) strongly accentuated in today’s society, to the point of our being forced into being social in the presence of our incapability of individual survival. This is a challenge once again, as soon as we realize that “we are human only in relation to other humans, and together with them” (Nake 2008a, 327).

### 3.8. SHAPING THE CONTENT OF UNIVERSITY

British scholar Ronald Barnett raises an insightful debate to reflect on the idea of the western university, a “partly mysterious” (Barnett 2010, 13) structure that in current times grows diverse<sup>87</sup>. He considers problematic those postures that imply a fixed idea of university as we approach an epoch of higher education in transition, immersed in times of digital media. For him, in a complex society “there will be many ideas as to what it is to be a university” (Barnett 2010, 2) in the light of given conditions. These conditions can be grouped into four different categories (Barnett 2010, 60):

- (1) empirical conditions of a university’s being, refer to the constrained nature within the funding dimension available to operative function, and how is this university perceived in the world, by staff and students;
- (2) ideological conditions of a university’s being are linked to the leading idea in society of what a university is supposed to be about. Is it more entrepreneurial, more social?;

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<sup>87</sup> Throughout his work, Barnett presents the idea of *university* in a playful way, augmenting it in different perspectives. Depending on the nature of each of the approaches, he classifies it with a name. This is a contemporary exercise to provoke discussion. Among all the different possibilities, I underscore the idea presented as “ecological university”, that Barnett describes as a university that takes into consideration all relationships, the idea of well being and all environmental issues being discussed in society. It is a university covering the global, regional and local (Barnett 2010, 5) Besides it, he talks about the borderless university, the civic university, the socially engaged university, the collaborative university, the cosmopolitan university, the edgeless university, the enquiring university, the entrepreneurial university, the university as fool, the injured university, the learning university, the networked university, the pragmatic university, the schizophrenic university, the supercomplex university, the theatrical university, the virtual university, the university of wisdom, the world university, the world-class university among others.

- (3) imaginative conditions of a university's being, appear in the sense of what is the vision for itself;
- (4) value background of a university's being, which indicates either if a university lives within itself, in-itself (referring to the research university), profiting from the world (entrepreneurial kind) or for-the-Other (social cause).

Moreover, an important aspect to be found in Barnett is his clarification of the terms "university" and "higher education". In his mind, »higher education« is considered an "educational process that may or may not be found in universities" (Barnett 2010, 2), a construction in favour of standards that enable educational processes on a tertiary level as objects to be assessed. However, the concept presented by Barnett is limited and inoperative when compared to *university*, as he thinks of it in terms of a "complex entity which is far from exhausted by talk of 'higher education'. Many other academic and developmental activities, other than higher education, are to be found within in" (Barnett 2010, 3).

We can then think of higher education as a limited and highly bureaucratic design which isn't necessarily linked to universities. On the other hand, universities are a collection of elements of growing complexity.

For Barnett, current conditions around the universities have muddled the figure. From an early configuration he presents as the *metaphysical university* the idea of education stirred by mystery, uncertainty and the unknown (what is *foreign* for the 'Geselle' in his journey). These were desirable characteristics (Barnett 2010, 15).

In its *metaphysical* version, it is in "hope of a better world, and understands that it has responsibilities towards that world" abundant with ideas, possibilities, and imagination (Barnett 2010, 20). Now, university must give up, and become a *pragmatic university*. It behaves closer to higher-education entities, for universities began to depend on control devices of all kinds. Declaration of outcomes, inflexible rules, human-resources routes, achievement and predictions. All the same, Gibbons et al. (1994, 71) point out that "specialization" is the cause that made universities quit on their "moral and cultural claims" to instead, grow disintegrated with the necessity of production. This originates in a problem-oriented research approach, which demands the abandonment of the open exploration of a world of phenomena in problem solving for instance.

This formal aspect of higher education is clear for Diana Laurillard, who in the early years of the Internet published "*Rethinking University Teaching: A Framework for the Effective Use of Educational Technology*" (1993). Having no awareness of the technological development about to come, she decided this was an important topic to seize on. Far more interesting than talking plainly about the

promise of new gadgets in the classroom, a noticeable lesson is to be learned within the first pages of her work:

[...]university teachers must take the main responsibility for what and how their students learn. Students have only limited choices in how they learn: they can attend lectures or not; they can work hard or not; they can seek truth or better marks – but teachers create the choices open to them. (Laurillard 1993, 1).

The initial statement in her analysis establishes a condition of high importance within education, because with her claim one is able to acknowledge the decisive role of educators in the construction arena of worldwide classrooms. This characteristic is well known for the 'Meister' figure in any guild, since he is responsible for modeling practice, orchestrating roles among apprentices and 'Gesellen' and to bring with his experiential awareness, a network of practices and necessary elements.

However, her stance can be taken as an intention to prioritize "learners" within the university structure. These students are compelled by our places of learning, which paradoxically, were meant to foster their learning and increase motivation in them. In her idea of university, the role of teachers is of utmost importance because on them falls the duty of "guidance", which for Laurillard is clearly a process of dedication. For her, the relation between teachers and students is more like an analog formula, one-one, the grounding criteria for assessment as "each case must be judged on its own merit" (Laurillard 1993, 2). This is certainly a challenge in presence of current demands in society, where the only apparent solution carries a digital spirit, *many-one*, as Laurillard mentions. This can be easily illustrated with the phenomenon of massification in higher education, as later I will argue concentrating on Michael Gibbon's work.

"Man is the measure of all things, of the things that are that they are, and of the things that are not that they are not" said the great sophist philosopher Protágoras, meaning by this that it is for us to decide what qualities to attribute to objects (Dahlbom and Mathiassen 1993, 152).

Mindful of this, it is known that among all different constructions needed to administer this organization, the place for learning at universities is commonly conceived along *didactic strategies*. These are helpful designs that support teachers in their teaching tasks and, as Biggs and Tang (2007, 50) discuss with their idea of "constructive alignment", are structures implementable within "any course at any level of university teaching" (Biggs and Tang 2007, 59).

A *constructive alignment* is conformed initially in the light of known *contents* defined for a knowledge area. They are there according to some previous arrangement, some curriculum, a national plan or some hidden agenda. Secondly, a teacher must *describe* the intended learning outcomes (ILOs)



(Biggs and Tang 2007, 55), known otherwise as the *objectives* of his design. Once these elements are settled, the “teaching and learning activities (TLAs)” enumerate the methods to be followed in order to get students to work or to pay attention (ibid., 56), a step that comes tied to “assessment tasks (ATs)” (ibid., 57), where the precise object or collection of objects is mentioned and finally, *grading*, (ibid., 58) which includes the sum of all general elements announced as the object of measurement.

As we can see, a didactic strategy is a framework to organize an educational setting. This sequence offers a precise route to assist the educational effort a teacher implements in a classroom. For instance, at the Universidad de Costa Rica, a teacher reflects on how to proceed and deliver successfully a sequence of contents. In her case, this sequence is traditionally indicated and presented in the syllabus, after some remarks and considerations made by the study-program coordinator. For this, she will design a didactic strategy that comprises certain elements:<sup>88</sup>

- a-) the teaching goal,
- b-) context of the content, normally related to pre-requirements in the curriculum and relevance for the knowledge field,
- c-) abilities and/or competencies for the creation of knowledge among participants, associated with the context of the students, namely their study year, and the competencies a teacher is attempting to emphasize,
- d-) necessities and motivations of the content to be learned, the attempt performed by the teacher explaining why this content is fundamental to their professional formation
- e-) effectiveness of strategy in comparison with other strategic alternatives, evidence of the process in terms of decision
- f-) general and specific objectives, definition of observable outcomes
- g-) theoretical foundations,
- h-) didactic strategy description
- i-) teacher’s role, responsibilities, conditions of participation, and personal expectations,
- j-) student role, responsibilities, conditions of participation, and personal expectations, homework, and evaluation criteria
- k-) context role,

Involved in her didactic design to influence learning, we may notice that among her criteria, several terms are monitoring procedures. *Requirements, competencies, effectiveness, conditions* and *evaluation*. Largely, dynamics within places of learning are strongly connected to the teacher’s

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<sup>88</sup> These are general categories indicated for a didactic strategy in the field of civil engineering at the Universidad de Costa Rica. (Cruz 2014, 32 *own translation*)

performance. Around this leading role is that everything gets orchestrated, including the place of learning for each student. This illustration shows not only the vulnerable condition of students in their places of learning, but should also stress the influence that places of learning bring to the space of the teacher, overburdened, who must follow parameters to be successful. This is clear in Laurillard's "*prescriptive implications*" to generate teaching strategies:

- there must be a continuing dialogue between teacher and student
- the dialogue must reveal both participants' conceptions
- the teacher must analyze the relationship between the student's and the target conception to determine the focus of the continuation of the dialogue
- the dialogue must be conducted so that it addresses all aspects of the learning process (Laurillard 1993, 85).

Expressions such as *must reveal*, *must analyze* speak of the overwhelming amount of responsibility inflicted on the teacher. The only reason we have protocols to generate teaching strategies is that the teaching process becomes operationalized, aspiring always to efficiency. Seeing this yet even more clearly, Laurillard offers a new strategy, one that suggests the traces of mechanization of our educational designs at universities. Describing it in the fashion of a program, one is able to notice the formal structure embedded in didactical instruments, in this case to assure teachers with more elaborate examinations, incapable the author warns us, of guaranteeing any quality:

1. State the aim,  $x$ .
2. Define a behaviour,  $y$ , that would demonstrate to you that a student had achieved this aim.
3. Is  $y$  defined precisely enough that you could agree with a behaviour? If not, return to 2, and refine the definition.
4. Is the aim achievable without being able to do  $y$ ? If so, and if  $y$  is a useful behaviour, then define an additional aim that fits  $y$ . Otherwise return to 2 and refine or replace the definition.
5. Does the collection of  $y$ s generated so far cover everything implicit in  $x$ ? If not, then return to 2 and generate an additional  $y$ .
6. List the aim and objectives so defined (Laurillard 1993, 184).

In both cases, these inquiries should be framed in a historical stage where numerous academics argue about a "*radical change*" of the university, one that faces problems in relation to exclusivity or knowledge in fragmentation (Imbernón 2000, 38), where the former idea of "school for all" now tends

to a “different discourse characterized by a return to ‘positivistic’ knowledge produced by brain research, evidence-based research, positivistic psychology, and leadership and efficient ideas in all matters concerning schooling” (G. Biesta and Säfström 2011, 545); a kind of crisis related to productivity and economic purposes (Cowen 1996, 246), to the structural uncertainty because of market-oriented strategies (Kuoppala and Näppilä 2012) and the lack of entailment with the knowledge produced in the outer realm of society (Gros 2007, 2) among many others.

Furthermore, it must be made clear that on top of this global tendency, a regional layer of demands is to be approached in the case of countries like Costa Rica. Dias (2008, 117) analyzes some of the side-effects in view of the rapid development of the higher education sector. Rightly, the author observes that in the presence of this expansion, there has been mediocre preparation within academics throughout Latin American institutions; a phenomenon that intensifies because of the importance of individual benefit and competition prevails over any other view.

### 3.8.1. The space of learning

Since the early 1970s, studies have focused on the study of space and how it has become a significant element in the process of learning (Arias 1996; Lim, O’Halloran, and Podlasov 2012; Levis-Pilz 1982; McGregor 2003; Sharples et al. 2009) to describe the meaning given to space and its importance in the process of education. A seminal bibliography came in 1966 with Hall and with it, the cyclical discussion about space expanded into different fields.

An interesting exploratory analysis is presented by Lim, O’Halloran, and Podlasov (2012) whose attention is directed towards teachers and the meaning created by their movements and location during a classroom; the goal is to understand some of the implications that could link space, movement and pedagogy during a lecture.

They base their findings on a categorization method inspired by Michael Hallida’s social semiotic theory, and next to it, anthropologist Edward T. Hall’s »proxemic theory«, introduced in 1966 in *The Hidden Dimension*. Reported in their research, they explain how the proxemics theory “defines four general sets of space – namely Public, Social-Consultative, Causal-Personal and Intimate – according to the typical distances in which they occur, as well as the extent of visibility and contact experienced by the other party” (Lim, O’Halloran, and Podlasov 2012, 236) (see Fig.10). According to their argument it is maintained that communications “within the classroom takes place in the ‘Social-Consultative Space’.

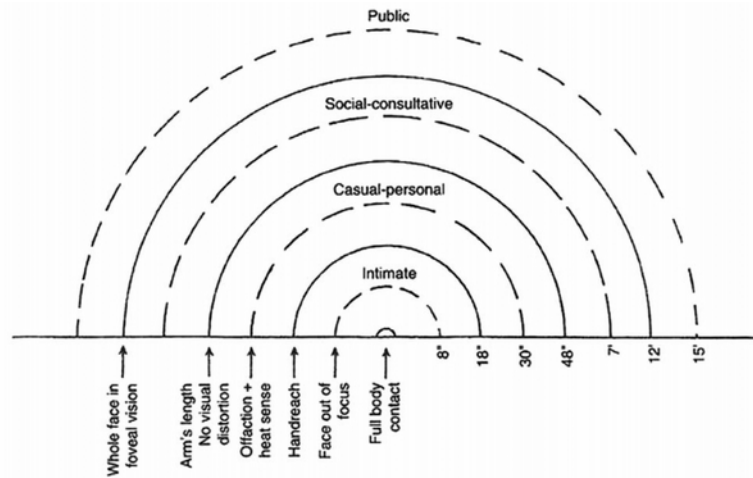


Fig.10. Edward T. Hall's general sets of space (Lim, O'Halloran, and Podlasov 2012, 237)

To create their analysis, they fragment this space with a semiotic approach of four sub-divisions that explain the classroom metaphor as a multiple object in the following way: (1) Authoritative Space, (2) Personal Space, (3) Supervisory Space and (4) Interactional Space (Lim, O'Halloran, and Podlasov 2012, 237). But how is it that their approach becomes relevant to our topic? Not just because it sets up the discussion around the altering roles of professors and students in educational scenarios, it also shows a case of amplification as semiotic extensions are issued to concepts such as 'space' and 'movement', mapping the times a teacher imposes authority by positioning away from the front-centre of the room, or by signaling the frequency of laughter as feedback whenever a teacher pursues informality with a given strategy.

Thus, these sequences become signs by themselves and avoid their typical connotation as vessels where signs exist. Even so their focus is restricted to the space 'classroom' and its social construction related to control, hierarchy and power. It serves well to question ourselves further about what or which other relations could be considered in connection with the concept 'space', a sign that serves much more than the plain background of others and instead, has independent qualities as mentioned by Gaines (2006). To illustrate the previous claim, Dahlbom and Mathiassen (1993) hand over a good exercise:

"A university is a hospital. You go to a hospital when you are handicapped by illness. The doctors treat you, and you leave the hospital a more capable person. You go to university because you are handicapped by ignorance. The professors treat you, and you leave the university a more capable person. A university is a factory. In a factory raw material is processed in a production line, leaving the factory as a finished,

standardized product. Students are the raw material for universities. Passing through a curriculum, they are worked upon by professors to leave the university as standardized products. A university is a prison. Inmates in a prison are subjected to discipline, taught to behave themselves. Students are taught by professors to sit down and listen, to behave in accordance with the norms of our society. A university is a sports event. Students compete. Some do better, some worse. They are expected not to cheat. Professors judge their performance, ranking them, handing out prizes” (Dahlbom and Mathiassen 1993, 266).

Relevant to this thesis, space in higher education is based on terms of various affiliations throughout literature. Often, it is present in association with concepts such as »mobility«, as it refers to “the ability to move or be moved freely and easily” (Oxford Dictionary 2013). According to (Gibbons et al. 1994, 38) this is a basic concept to associate with “cross-fertilization of scientific ideas” in order to produce knowledge, trade of thought and new techniques. In the author’s notion, the reunion of academics from different locations in one spot has shown to be useful because it allows “the opening up of novel pathways towards solutions” (ibid., 38). These pathways are certainly leading a person towards a destiny, and if a wanderer were to stroll down them, they would be apt for him. But the kind of exploration that happens on these pathways isn’t high speed:

The more mobility a science system permits or even encourages, the more potential instances of this kind can be expected (Gibbons et al. 1994, 38).

However, I suggest that next to the strong development of mobile technologies and the Internet, this topic has confusingly pervaded culture, and it is now ubiquitous in practices of every ‘post-medial community’. One of the repercussions in palpable terms, is that there seems to be no clear consensus about the meaning of the term in its connection with learning. In this line of argumentation, Laouris and Eteokleous (2005) openly requested “relevant definitions” 10 years ago, since *mobility* as a concept appeared to invite us to find the true meaning of learning.

Similarly, (El-Hussein and Cronje 2010, 14) consider the implicit challenge that becomes perceptible whenever we try to define *mobile learning*, as mobility and learning are manipulatable terms that may allow “different people to mean different things” in reference to learning events that take up mobile perspectives (ibid., 14).

Facing these conditions, a vulnerable scenario emerges. This is precisely a point to pay attention to as it seems that strategically certain mainstream discourses take hold of these ideas with biased

interests, favouring the economical, that is, the discourse around development. Necessarily, these stances may threaten the educational agenda, as they suggest *mobility* and *technology* in the light of commodification without considering fundamental issues such as “ethical implications of mobile learning, such as the inherent problems in being able to track users. [...] Are people happy to compromise on the availability/use of their private data if they are to benefit from this? (E. J. Brown et al. 2010, 52).

This action is incautious, as it may serve as a “Trojan horse inside of which are forces that might disrupt the routines of the classroom” (Olson 1984, 3). Furthermore, this aspect of mobility is often used to complement the idea of internationalization as B. Crawford and Bethell (2012, 205) announce, given that mobility rises a fundamental contribution to the phenomenon. However, the authors underscore the necessity of reviewing those initiatives that aim in this direction, thus avoid thinking of mobility as “an individual consumption of the exotic” [...] or a matter of “mobile bodies but not mobile minds” (“Mobile Bodies, Closed Minds” 2004).

Correspondingly, this debate on mobility takes place in the Latin American scene. On the one hand, its relevance in the region is certainly recognized, as mentioned by Chaparro Navarrete (1998, 26), because of the high percentage of academics who have studied at prestigious North American and European institutions and now return to their countries committed to make a difference with their students.

On the other hand, there are other cases where institutional policies include “academic mobility” as trade money for success and status. In such a situation, the meaning of space seems to remain blurred within the academic domain, including places like Latin America. A region lacking in much research on the university teaching topic can always fall prey under the concealed subface of some bureaucratic system we are not initiated into.

In Latin America these sorts of agendas increase, as evidenced at the *Summit of the Americas 2015*. There, university leaders of each country discussed a *revolution* of global proportions triggered by *technology*. Their premise was that media “transforms where, when and how people learn” and since universities aren’t “immune” to this movement, they are striving to jump on the wagon. Their interest is situated upon making universities harness *technology for economic advancement*, and surely *academic mobility* to be able to think not just about people moving, but also a “unified and coordinated curricula, standards and credentialing” (Foro de Rectores de las Américas 2015, own translation).

Here, the space of learning at university is experienced not necessarily as ‘Geselle’ on the trail, letting the subject lead in freedom into a landscape for reflection; it is rather more like a motorist,

unable to move *in* the landscape but instead *rushing to* a destiny, using the same road where “the landscape moves past him. It becomes a mere panorama” that eventually disappears depending on the efficiency of the road or the increasing speed (Bollnow 2011, 104). This debate was already raised by Illich:

Once they accept the authority of an agency to define and measure their level of knowledge, they easily go on to accept the authority of other agencies to define for them their level of appropriate health or mobility (Illich 1975, 32).

Moreover, there are educational researchers delving even deeper into aspects of ‘experience’ and ‘space’, stating it is necessary “in order to gain newer insights into the pedagogical process and how the classroom experience is constructed for the students. This is a particularly important agenda in the current age of interactive digital media technology” (Lim, O’Halloran, and Podlasov 2012, 1). Looking further into Laurillard’s words, this becomes an important challenge based on a decision we must always take at universities when it comes to teaching: either we will be aiming to *teach abstractions* or enabling learners “to learn abstractions from multiple contexts” (Laurillard 1993, 19) or in other words, teaching in order to foster *academic knowledge* or *everywhere knowledge*. Following this suggestion, it would match fine with the affirmation expressed by Dahlbom in relation to abstracted solutions from problem-solving approaches:

Problem-solving is often a matter of creative discoveries of possible operations, perhaps by means of seeing the problem differently, from a different viewpoint, by making a creative recategorization of the problem (Dahlbom and Mathiassen 1993, 91).

For Laurillard, university efforts must be located in academic knowledge, not because she is not aware of the importance of *actuality* in the wandering path of students, but because the mediation process teachers perform at higher education aims to widen the perspective students have, in order to influence how they experience the world. In her and Dahlbom and Mathiassen’s asseverations, we see that abstraction as metaphors, or even instances of a class, flexible enough to adopt new forms if configured in an adequate way.

Following an epistemological interest, Laurillard’s “academic knowledge is located in our experience of the world” (Laurillard 1993, 26) because teaching, as we have already stated, is a mediation act for learning that involves the construction of places to foster learning in students. In this place, they might learn a set of descriptions that teachers (or someone else, a curriculum for example) judge are

important for knowing about what is happening outside, in the outer world. This set of descriptions is built based on the teachers own (everyday experience) or someone else's experience (academic experience).

Given that teaching is a mediation act, Biggs and Laurillard suggest teaching is an action that involves surfaces or layers. Biggs and Tang (2007, 22) on the one hand, speak in terms of "surface and deep approaches to learning". In the first case, they refer to those settings that trigger in students "low cognitive-level activities" in response to "higher level activities". The authors indicate that this surface "arises from an intention to get a task out of the way with minimum trouble" (ibid., 22).

On the other hand, a deep approach for learning "arises from a felt need to engage the task appropriately and meaningfully, so the student tries to use the most appropriate cognitive activities for handling it" (ibid., 24). Similar to this, Laurillard (1993, 27) points out that different kinds of learning take place in "first and second-order characters". The first order refers to our experience while being in the world, that is, where we learn in a non-mediated<sup>89</sup> way, interpreting phenomena directly through our senses in combined action with reflection. Teaching, she says, is located in a second-order character, where we learn about descriptions of the world.

An important factor that Laurillard doesn't explain further has to do with the social dimension accessed by students, as soon as they learn in a first-order character. In other words, it remains unclear what kind of relation exists with other second-order instances of learning, as there might be alternative configurations available for this student outside the classroom. What if this student now, out in the world, turned into a 'Geselle'. Does he learn as he labours with others like him? In communities of practice this 'Geselle' will be attentive to a master who offers him second-order descriptions on how to approach certain elements of the world. This time however, all elements are of a different kind. We have seen in Sennet that *Homo Faber* is able to *make* while "thinking and feeling", a dual event which is certainly different from the second-order place at university, where students may turn into *immobile bodies with mobile minds*.

Nevertheless, her text includes a social aspect of interest in the student's context, namely, what kind of previous experience a student has. According to Laurillard, it is more relevant to identify what students bring to learn in terms of "how the student conceptualizes all the aspects involved in the procedure" (Laurillard 1993, 37) instead of analyzing which concepts are there for students already; more important is how they come to this knowledge. In a way, it is pointless to think of evaluation of concepts as it ends up being trivial, as explained by Laurillard. Ultimately, teachers should better concentrate in discovering the concept of *reality* students hold, as its acquired by each person in the

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<sup>89</sup> I prefer Ernst von Glasersfeld's terms "experiential interface" (see p.88)



first-order level of knowledge. For Laurillard, this is our best possibility to approaching that space. Equally, von Glasersfeld (1996, 176) highlights the importance of goals in teaching. He insists that “education requires first of all a clarification of what one intends to achieve”, which for him, it is clear, must remain political as we are to help students to “think for themselves”, and to record all “ways of acting and thinking that are at present judged the best” for newcomers. In this view, it is shared with von Glasersfeld that institutions aren’t neutral entities, but are places to use knowledge as instruments, never “Truth for Truth’s sake” (von Glasersfeld 1996, 177):

“A conception is not a property of an individual in the way of a nose is; it is an aspect of their behaviour in the world and their experience of it. With that kind of epistemology it is impossible to expect that we can discover anything worthwhile about conceptions by looking at traces of how people carry out tasks” (Laurillard 1993, 36).

This debate is fundamental for my analysis later on, as it is decisive to speak on the design of places of learning, but thinking this time in the space of each student. If we don’t consider it, our duty in higher education becomes even more complicated because it isn’t any longer about persuading learners to modify their perspectives, but is about convincing them that my offer, namely my description of the world, is more apt than any other perspective being offered in the outside world.

We would then enter a realm of competition and fragmentation where Barnett affirms, “the scientific university” overpowers the “research university”. The same historical division appear in Snow’s two cultures, where the *hard sciences* are granted the dominant position on the knowledge matter of society. Their supremacy is fundamental, as they are the glue that brings together “universities and industry”, but also are deeply “interconnected with both the state (including the military) and industry (especially in the technological oriented parts of industry)” (Barnett 2010, 21).

According to Gibbons, to maintain this structure it is necessary to change focus and pay attention to “the problem area, or the hot topic, preference given to collaborative rather than individual performance and excellence judged by the ability of individuals to make a sustained contribution in open, flexible types of organization in which they may only work temporarily” (Gibbons et al. 1994, 30).

Against this scenario, softer sciences are obliged to hold back “in the shadow of the physical sciences” (Barnett 2010, 21), under the idea of *divide and conquer* presented by Bannon and Bødker (p.30). In such cases, a teacher at a university would be forced to endure. On top of all *lively* descriptions offered by brothers and sisters of the guild, his description of the world must by all

necessary means be the ruling vision.

Operative, hard sciences belong to Laurillard's academic approach, where teachers may behave more like scientists. They rely "heavily on symbolic representations" (Laurillard 1993, 27). The educator (different from the 'Geselle's master who actively participates with his student sharing his craftsmanship) describes the experience of the world mostly through "language, but may also be through mathematical symbols, diagrams, musical notation, phonetics, or any symbol system" (ibid., 27). These *thingnesses* are meant mostly for mobile minds, while bodies remain immobile. Requiring interpretation is the only way they can get to know the palpable that happens outside.

Different from the 'Wanderjahre', a learner is in need of retreating into the landscape and reflection, however his process doesn't depend exclusively on wandering or being abstracted away from the world. Contrarily, the importance of practice comprises the idea of content, doing and reflecting with "*others like him*" and is fundamental to the construction of knowledge. As soon as the lesson at university is over, the student is in the world he learned about in class. How close was the teacher's description to the actuality of the everyday? Laurillard says:

Mastery of the art of taking examinations designed to test knowledge is more prevalent than mastery of the knowledge itself. The teacher will often be building on sand (Laurillard 1993, 27).

Another big issue, indicates Barnett, comes related to the little space universities have to manifest in their authenticity. He associates this affair to the digital revolution, where the university is impelled to perform recursive roles to end up covering several different processes at the same time, this being compared to the manner of "billions of messages that circulate the world in an instant" (Barnett 2010, 17).

I suggest considering this with Gibbon's debate on massification, which for him started at the time universities began to prioritize research and science in their action lines. Slowly, it became criteria to differentiate the elite establishment from the rest. He observes that the industrial system started to profit from this "flow of trained manpower" (Gibbons et al. 1994, 85) and successfully, it not only created an expansive wave not only within the industry but also gradually inspired other sites in society.

This set blossoming ubiquitously endorses the university's research sector, for which they grant university members recognition in the professional work. It must be noted that in the middle of this arrangement, we could locate the figure of *corporate university (surely combined with the entrepreneurial and research university)*, that behaves segmented and gets served by the bureaucratic

vision. Barnett (2010,50) indicates that linked to this university configuration, “comes the establishment of marketing departments” which promotes the idea of ‘brands’, publicizing and selling this to acquire status and credibility among affiliated members and in a global market. Barnett follows with an interesting remark on how to recognize the *corporate university*:

Whether a university has a largely local, national or global reach, it is now part of a world-wide web of universities that compete with each other both for prestige and for income. The appearance of global rankings of universities is but an indication of these phenomena (Barnett 2010, 52).

In Gibbons et al. (1994, 85), the global factor is associated once more with the term *mobility*. He suggests that universities, while being paired to the industry sector, aren’t capable of approaching specialization programs to handle the changing nature of industrial practices. Instead, the *corporate university* needs to increase watchfulness in their own practices to find control over them (Barnett 2010, 46), behaving first in the fashion of the bureaucratic university, which is to an extent part of the base for the corporate one. Being thus, it needs to invest important efforts in non-academic initiatives related to staff, and in addition, “effective management of its own resources” (ibid., 47). Trusting its processes in its bureaucratic bases, the *corporate university* could be able to suffocate creativity and spontaneity (ibid., 56).

Thus limited, universities aren’t encouraged to assist graduates who are then forced to move on into higher education programs elsewhere. In this realm, companies and private instances are capable of managing educational aspects for their employees as they must take care of intricate duties. In view of this scenario, Gibbons argues that in the future<sup>90</sup> universities will be outperformed as the knowledge-producing sector (ibid., 85). This is also clear for Biesta and Säfström (2011, 544), who see that even in progressive Sweden, government policies grant economic support to “free schools”, “which follow a national curriculum but are privately owned companies funded with tax money, in effect turning tax into private profit. Newspapers report that starting a school is the most profitable business in Sweden, with the lowest risk and the highest return.”

In this open scenario, industry and university grow into mutual convenience. Yet, in times of standards, »innovation« becomes another concept of interest. In this sense, the postmodern university, “a multi-centered, if not in fact centre less, learning “centre” that is radically de-centralized” (Raschke 2002, 11) moves on but narrowed in the security of scientific, pragmatic manifestations, by the “lack

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<sup>90</sup> His book was published in 1994. It seems to me that some of his postulations describe fairly the current tendency and challenges for our universities today.

of freedom of the other”, (G. Biesta and Säfström 2011, 540), lacking of analytical processes “to inform future planning and implementation” (Lugo and Schurmann 2012, 36) and by considering learning “founded on an illusion of stability of context” (Sharples, Taylor, and Vavoula 2007, 230). Under these settings, processes that are traditionally linked to the “creative” domain become of interest to the innovation agenda of institutions. Havelock and Zlotolow define innovation in the following way,

...any significant alteration in the status quo [...] an alteration which is intended to benefit people by making their situation of work better in some way (Havelock y Zlotolow, 1995, 21).

Methods, prediction and skills are exploited in pursuit of high efficiency and precision; however, efforts to bring innovation or creativity into such frameworks garner attention. It is interesting that some research sectors have delved into the topic as seen in Thaler 2013 and Abdel-Fattah, Besold, and Kühnberger (2012), who out of cognitive theories, aspire “to explain creativity with cognitive principles and to subsequently model creativity with logical means” (Abdel-Fattah, Besold, and Kühnberger 2012, 2).

The place of learning is a place in need of significant alterations, a combination that must be adopted by teachers who are to be called imaginative designers of innovative spaces. Biggs for example, includes a chapter on “assessing creativity” where he defines that “‘experimentation and innovation’ and ‘the ability to realize ideas’ [...] imply originality: the ability to create something different on a foundation of the known” (Biggs and Tang 2007, 228).

A classroom is certainly a fabrication, that is, a design. For John Maeda, design is everywhere but not found in the forest, which, to my mind, is a fair metaphor closer to the domain of practical knowledge, blurry and metaphysical, in the realm of Vico’s *poetic wisdom* and Laurillard’s *everyday knowledge*. For Maeda “design is a way of making meaning, making meaning more, that is meaning full” (Maeda 2013b). It is the clear attempt to grasp natural phenomena, get closer to actual experience, where no media beyond our senses is needed”. He adds that there is a “central element whenever we reflect on design thinking” (Maeda 2013). This is the sequence of ideation, but most important, he speaks of “imagination, mystery and enigma”, a component in the act of reflection as explained by von Glasersfeld. All of this happens in “an uncertain world by marrying form with content, and content with context” (Maeda 2013a).

If there were something known as innovation and creativity, it would be useful to understand it based on an analogy offered by Maeda. In his allegory of the gardener’s apprentice, he tells about one apprentice of a master gardener in Japan, who standing in the presence of an un-designed extension of

land, aims to find a harmonic design. For this, the apprentice avoids to fixating on the fragments or elements that traditionally constitute a garden. What he does instead, is to study and observe for a whole year those little insects dwelling in this garden because “design is defined by what lies beneath everything and around”. Simplicity, design and craft (Maeda 2013b). They all come together. We may want to be reminded that the ‘Geselle’ in his journey, attempts not to learn exclusively building techniques to become a better craftsman, but instead, he studies carefully the raw material and its properties, as context is never silent.

In Maeda’s closing ideas (*see Table 2*) we can distinguish two different approaches in terms of the *safe side* of design against the “*creative*” approach. In the context of my arguments, we might want to associate this to analytical and holistic aspects that might be relevant for the design of places of education at universities. In such sense, following standards would be contrary to the creative domain proposed by Maeda. Implicitly, this would mean that under given conditions, the traditional approach that remains still popular, focused in controlled and efficient ways to teach, may be pushing us away from any creative domain.

<b>Creative</b>	<b>Safe</b>
Intuition-based	Evidenced-based
Surprise!	No surprises
Spontaneous	Practiced
Jagged Path	Linear Path
Makes Shit Up	Sticks to the Facts
Divergence	Convergence
Validity	Reliability
Outside the Box	Inside the Box
Experiments	Does No Harm
Go for it!	Get it Done
Leap of Faith	Sure Thing

Table 2. Creative and safe approaches for design (Maeda 2013b)

But what if these concepts of innovation and creativity weren’t proper for our places of learning at university? For Nike (2008), it is not possible to observe abstractions of mankind in the same way we observe human beings. In his analogy, the creativity that we normally mention in favour of the artists is not a property of systems, as the educational project is. A classroom, a design or a place weren’t

creative but those individuals who “who, when acting for society, transcend their individuality” (Nake 2008a, 325). But still, these individual actions aren’t creative. To the extent that these actions are justified and recognized by external entities that declare them creative, there wouldn’t be creativity. In Nake’s idea, creativity exists after critics, teachers or external agents with certain characteristics entitled them with this appellation:

When teachers decide to let a work by some artist become the subject matter of their lesson, they become one minuscule organ of the societal total worker whose action is needed to transform the work into the celebrated work of art (Nake 2008a, 325).

In Nake’s description, we find a configuration of elements, which if further developed, might have the conditions to become an innovative “case study” within a given place of learning at a certain university. This would be the case strictly in presence of others: colleagues, students or standards that from outside the place, declare it an act of creativity or not. If we thought of innovation in this way, according to Nake there wouldn’t be a possible match in terms of someone being creative. In his words,

Creativity as an abstract, general concept, taken out of context, is unlikely to exist. If a helpful concept at all, creativity is bound to situations and contexts. [...] Like any other measure, a test of your IQ (\*Intelligence Quotient) may at best say something about a standard behaviour within given boundaries, but not much about crossing boundaries. [...] When we consider creativity as an attribute, a property, or a feature that we may acquire by taking courses or joining training camps, we put creativity close to a thing, or a commodity” (Nake 2012, 62).

### 3.8.2. The burden of teaching

But how difficult it is for a professor who studied in other times!  
unacquainted with technology, which has gradually incorporated  
in many cases with fear and even difficulties to understand its use, to  
develop abilities and skills to be used in performing professional activity  
and university teaching. (Regueyra Edelman 2011, 6 own translation)(\*)

When Laurillard designates teachers as those responsible for student learning, she is certainly not alone in her concern. Like hers, there are multiple voices since the 1970s (Biggs and Tang 2007, 20) that discuss the idea of educational processes that take place in higher education. In comparison to primary and secondary education, university teaching develops into a fresh inquiry in need of exploration.

A first issue I want to call attention to is Borsese and Marazza (1998, 178) for instance, who report that one of the important challenges within higher education has to do with teachers' educational process. This deficiency is also observed in specific contexts such as at the Universidad de Costa Rica, where some educators deny their identities as they "recognize themselves not as teachers of a given discipline, but as specialists of a known field performing teaching activities" (Salazar and Cascante 2011, 3 own translation)<sup>91</sup>. This lack of awareness and participation within the practice of education is significant for relevant debates on *Environmental Education*, because in their role of educators, they should become agents of change.

However, to achieve this status, their authentic commitment must be evident beyond any discursive approach. "Environmental issues address us all, scientists, students and citizens; we remain in need of achieving a state of balance and harmony between nature and humankind" (Chaparro Navarrete 1998, 30 own translation)<sup>92</sup> These are fundamental issues to note. However, one must always keep in mind that heading down these paths may lead to extreme positions "arguing that the solution lies in getting the agenda for education 'right'" (G. Biesta and Säfström 2011, 540).

All in all, university teaching seen as a "political' enterprise" (von Glasersfeld 1996, 176) is a significant approach for pedagogues and all professionals that come together in communities of practice. As they gather, they concentrate on and may engage in exploring ways and methods to better understand their common study object. Some will be aware of the potential influence their actions will have on students' *learning*. In spite of their willingness, their range of exploration remains limited as their space of learning is often constrained within traditional locations, e.g. classrooms, laboratories and lecture halls; which at the same time are places conditioned within other constructions that dictate their attributes. Curriculums, departments, universities or standards are such fabrications.

Laurillard's claim that teaching is a second-order character activity is useful. As their work is basically convincing with words or descriptions, all representations of some kind, teaching is primarily a »rhetoric activity« (Laurillard 1993, 29). In fact, a large part of her book is dedicated to the "conversational framework", where teaching and learning become a dialogue, as they operate with "the label of descriptions of actions in the world, recognizing the second-order character of academic knowledge" (ibid., 94).

The importance of dialogue and rhetorical possibilities in teaching may jeopardize the role of

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91 "[...] el docente universitario se reconoce como profesional de una disciplina desarrollando actividades de docencia y no como docente de una disciplina."

92 "Los aspectos medio ambientales preocupan por igual al científico y a la persona común que vivencian sus efectos: la necesidad de alcanzar un estado de equilibrio y armonía entre la naturaleza y ser humano y, como resultado de ella, la armonía consigo mismo y con sus semejantes."

teachers at places like The Universidad de Costa Rica, where the increasing numbers of students or infrastructural conditions make *lecturing* the common and necessary interaction between students and professors.

A lecture<sup>93</sup>, according to Francis and Piedra (2009, 32 own translation<sup>94</sup>), “demands self-confidence and experience from the professor. While it isn’t advised to designate novice teachers in such settings, it is a known common practice. [...] The authors compared it to a play, where teachers are exposed to high possibilities of performance anxiety.”

Moreover, I find it useful in Francis Salazar (2006) that she generously explains characteristics attributed to university teachers. There, she underscores attributes of professionals qualified as “excellent” in their teaching initiatives (Francis Salazar 2006, 32)<sup>95</sup>. Her review emerges from a “research and performance assessment process”, which isn’t relevant to my analysis. However, I find it instructive that the author suggests, beyond the structural construction of her portrait, that the role of teachers is highly complex, explained with (a) a multi-dimensional construction (personal, disciplinary and pedagogical approaches) and (b) historical and contextual value. Important for Francis is that traditional profiles of professors described with “check lists” aren’t appropriate, as the “complexity behind the teaching act is perceived in the interrelation of all these dimensions, for this is suggested a dialectical exercise between them and the teacher’s link to academic communities” (Francis Salazar 2006, 45 *own translation*<sup>96</sup>)

Similar to Laurillard (1993) and Francis Salazar and Piedra García (2009), the importance of dialogue with students is emphasized: a relationship that “comprehends actions beyond the classroom walls, this plays a significant role in the encouragement of the student’s achievement” (Francis Salazar, 2006, 38 own translation<sup>97</sup>)

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93 Their research project focus attention on didactic strategies for large groups (over 50 persons) at Universidad de Costa Rica.

94 “[...] la enseñanza en clases grandes es difícil y requiere del profesor mucha más seguridad en sí mismo y más experiencia. Es de una gran irresponsabilidad asignar las clases más grandes de los primeros cursos a los profesores más recientes y faltos de experiencia, como ocurre con mucha frecuencia. [...] una clase grande se parece más a una representación teatral, con mayores posibilidades de miedo escénico que la enseñanza a clases más reducidas.”

95 The article is originally entitled in Spanish “Hacia una caracterización del docente universitario “excelente”: una revisión a los aportes de la investigación sobre el desempeño del docente universitario”, but it is seen that in her abstract, she translates the issue as “an analysis of the qualities of an effective college professor”. I find it better to translate the word “excelente” as *excellent*, avoiding *effective*.

96 “La complejidad del acto docente se ve demostrada en las interrelaciones de dichas dimensiones, y por ello, es necesario proponer metodologías que permitan evidenciar y reconstruir desde la dialéctica que se muestra entre las dimensiones del docente y su vínculo con las comunidades académicas.”

97 “[...] lo cual supone acciones que van más allá de las paredes del aula y van a jugar un papel significativo en la promoción del



In view of the previous claims, in a post-medial society we may think of university teachers as “academic travelers in time and space, limited in large part by their imaginations” (Barnett 2010, 80). All these relations beyond the walls of any classroom, between different entwined dimensions, dialogues and activities are in terms of Lave (1996, 158) a kind of teaching in “cross-context”.

As educators take part, they make it possible for other members within communities of learners to have access to high-quality resources. In this case, “great teaching in schools”, means for Lave that educators improve these communities, interchanging with students and others, involving through practices and “facilitating the circulation of knowledgeable skill in the changing identities of students” (ibid., 158).

This possibility of dialogue and rhetoric as a bridge for the space of learning is recognized as fundamental to the arguments in this thesis, not only in the light of theoretical foundations but also because of its irrefutable importance expressed by students at the Universidad de Costa Rica as shown in the results chapter of this thesis. Teaching is then, as William F. Hanks announced in his foreword dedicated to Lave and Wenger (1991, 16), a framework with “a constitutive role in learning for improvisation, actual cases of interaction, and emergent processes which cannot be reduced to generalized structures.” These characteristics belong to the realm of »performativity« in teaching.

The term *performativity* is originally proposed by John Langshaw Austin, interested in accenting the capability of utterances, the force of words parallel to action. However, the concept is better explained by Judith Butler, for whom “ ‘saying something’ means producing effects and consequences in the emotions, thoughts or actions of oneself or others” (Escudero and Farias 2009, 479). According to these authors, their position is reaffirmed by Butler who expands on the idea of the influence of words over others. Closely related to the place of learning at universities, he asserts there is a “force or power that these acts have on other subjects, and on the speaker himself” (Escudero and Farias 2009, 479), which leads eventually to transformations accordingly with intentions.

However, use of *performativity* as a term refers to *performance*, which is understood as the act of presenting a form of entertainment. More simply, ‘perform’ comes from the Anglo-Norman French word *parfourmer*, meaning alteration (by association with *forme* ‘form’) and the Old French *parfournir*, from *par* ‘through, to completion’ + *fournir* ‘furnish, provide’ (Oxford Dictionary 2013). A performer in this sense provides what is missing to “complete” a shape. A teacher as a performer, provides descriptions necessary for students to complete their idea of the world, which can not be complete through only their senses. In this follow up, the performer *performs* a shape which is embodied.

In front of an audience, an *entertainer* makes use of all kinds of languages available, a feature noted

by J. David Bolter and Grusin (2000, 237) as they see the human body as a medium. For them, every choice in terms of clothing, jewelry, cosmetic surgery, bodybuilding among others, represents a kind of decoration that “appears to respect the boundary between the body and the world” (ibid., 237). Accordingly, Postman points out that clothing for children in early schooling systems was contrasted with that of adults, a strategy that eventually contributed to the social construction of the modern family (Postman 2011, 44). In terms of Dahlbom and Mathiassen, it becomes a symbolic quality, assuming the whole expression of the performer with the classroom as an *artifact*.

In general, we tend to believe that while functionality dominates working life, in our private lives we are often more interested in aesthetic and symbolic qualities. But is this really true? Buying a lawn mower or a dishwasher, we look for functionality. Architecture is one area in which corporations tend to stress symbolic value at the expense of functionality. And the uniform of the office worker, the suit and tie, is symbolic rather than functional. (Dahlbom and Mathiassen 1993, 148)

To think of the performer in places of learning highlights a teacher that is not only an academic as seen by Barnett, but also one in a *liquid university* –for him inspired by the Zygmunt’s *liquid modernity*– (81) where academy “is always on the move and interacting with its environment [...] in a never-ending succession of shapes’ (Barnett 2010, 110). It is necessary for academics to turn their identities into liquid ones. For this:

[...] to be ‘an academic’ is no longer clear. Other categories – perhaps ‘teacher’, ‘supervisor’, ‘project leader’, ‘researcher’, ‘co-worker’ or ‘curriculum developer’ – are borne more easily as self-descriptions. Characteristically, too, individuals are not identifiable by any single category. Across multiple roles, they take on multiple identities, it seems. (Barnett 2010, 117)

Acknowledging these ideas, I have attempted to view the concept of ‘higher education’ in a broader sense, for this, ‘university’ has been presented. In the narrative sequence, we have studied some basic aspects relevant to a later discussion; however, there is still one aspect to discuss that will assist us in better understanding the idea of humanism and university. For it, I dedicate some reflections on *Bildung*.

### 3.8.3. Rethinking university teaching as *Bildung*

Gert Biesta together with Carl Anders Säfström wrote in 2012 a “Manifesto for Education”. These professors reflect on “education”, their area of interest, feeling it is under heavy attack, threatened by certain sectors of society. In their defense they propose:

We propose that to speak for education in an educational manner means to express an interest in freedom and, more specifically, an interest in the freedom of the other: the freedom of the child, the freedom of the pupil, the freedom of the student (G. Biesta and Säfström 2011, 540).

Freedom, we have seen, is a concept of interest to Hanna Arendt, Austin and Butler. But before them and most likely influenced by it, one should keep in mind the historical reference in *Bildung* and its contextual state to better understand a possible reflection in postmodern times.

Conceived by philosophers of the Western European Enlightenment age, the concept arose in times when civil society was taking a new shape that anticipated the illumination of the individual, the search for truth and reason in order to set the individual free. This is the time that laid the foundations whence science will become –until now– a central figure of development. Times when influential voices delved into historical lessons taught in Greece, sculpted by their great philosophers. Dahlbom and Mathiassen explain it as follows:

“The mechanistic world of view was given its definite shape by scientists like Descartes and Newton in the seventeenth century. Descartes laid the groundwork for what was to be called rationalism, a belief in the rational order of the world with mathematics as the supreme example of human knowledge. Newton inspired his fellow British philosophers to formulate empiricism, a theory of knowledge that took physics as its model and believed in sensory experience as our main source of knowledge (Dahlbom and Mathiassen 1993, 107).

However, this belief driven by the picture of reality, offered through a theoretical approach came to be refuted. After the French Revolution in 1789, society underwent profound changes, a time when romanticism germinated in admiration of emotions, emphasizing a metaphysical world of blurriness.

In the middle of this tension Humboldt suggested a model of education. *Bildung*, in its connection with the university as a social project, aimed for the union between the scientific [Wissenschaft] and the humanities. Different from the “*English model* which promotes a knowledge of what to do, behave and live as leading a class without questioning institutional power; or to the *Napoleonic model* which

includes the public university for the middle class in order to learn the liberal arts in service of the state” (Quezada Zevallos 2005, 35 *own translation*). The Humboldt model of university “proposes a kind of public university in search of truth by means of absolute freedom and autonomy to accomplish this mission; it promotes scientific endeavours; and its purpose isn’t the formation of professionals but future academics, which is why seminars become its best didactic strategy” (Quezada Zevallos 2005, 36 *own translation*<sup>98</sup>)

Observing Mortensen’s (2003) reflections, *Bildung* must be considered with context. According to him, by the 1700s the term had changed profoundly. First of all, a differentiation is made between *Bildung* and *cultivation*, due to the association both of these terms had. In its analysis, Mortensen declares that *cultivation* stands for a value of that which is “given”, we could even say presented and necessary for humans to practice in order to achieve a goal. In such terms, a ‘user’ is someone who is *cultivated* into something.

On the other hand, in *Bildung* a process of recognition and appropriation goes beyond external conditionals. The latter is a fundamental principle to understanding the formation of societies, which could imply that it is through *Bildung* that understanding the *individual* is driven not only solely by the impulse of the self, but also by an awareness of limits as one gets appropriated from the other.

*Bildung* thus signifies that man is not just what nature has made of him. Rather than consuming things, man forms them, and inspired by Hegel’s thoughts, thereby raises himself above the immediacy of existence to universality. By forming things, man forms himself. Here, we may notice a close connection with our ‘Geselle’, a manifestation of *Homo Faber* in participation. In man’s ability to rise above his immediate desires, to transcend himself, lies the seed of his sense of what is ‘not self’, and thus his ability to limit himself. As a sense of the universal, *Bildung* is a precondition of human community, of forming societies (Mortensen 2003, 124).

Mortensen states that “*Bildung* is about identity, not an isolated and individual –particular and private– affair. Identity formation is a process in which the self is confronted with what is alien outside and inside itself, thus making chance necessary. Man must constantly transcend himself in order to become himself” (Mortensen 2003, 125). As we follow the author’s thoughts, I suggest creating a

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<sup>98</sup> La Universidad Moderna desarrolló tres modelos diferenciados: el modelo inglés que trata de comunicar un saber hacer, un saber comportarse, un saber vivir como clase dirigente. En este modelo, la relación Universidad- política es consubstancial, aunque se trata de una política que no cuestiona ni a las instituciones ni a la estructura del poder establecido. El modelo napoleónico configura la universidad pública, al servicio del Estado, en la que una ascendente clase media aprende los saberes específicos para el ejercicio de las profesiones liberales: medicina, derecho, ingeniería, comerci, etc. Por último el modelo alemán o humboldtiano, propone una universidad que es una institución pública dedicada a la investigación de la verdad, que requiere plena libertad y autonomía para cumplir su misión; enseña a hacer ciencia; su finalidad no es preparar profesionales competentes sino futuros académicos y, por ello, el seminario se convierte en su mejor método didáctico.

connection between this stance of *Bildung* presented by Mortensen and Bollnow's ideas, especially in terms of the construction of the self and the intimate, in contrast to the idea of the *foreign* [Fremde] (137).

Moreover, *Bildung* is fundamental to my argument because immersed in it, the figure of the 'Wanderer' [wanderer] emerges. As presented in the *Learning by Wandering* metaphor, the concept of this romantic idea is influenced by the spirit within this epoch. In his book "The Wanderer in Nineteenth-Century German Literature" (2008), Andrew Cusack assists us with an appropriate analysis for our debate. Mainly, he studies Goethe's *Bildung* novels<sup>99</sup> as they were considerably influential in the edification of the idea of *Bildung* that then prevailed. In these novels, Wilhelm's the development is central as he embarks on an educational journey. However, behind Goethe's words, a rich legacy of social tensions and ideals appeared, profoundly studied and admired by influential thinkers of the time.

In the story, Cusack sees the symbolic value Goethe depicts in the figure of the 'Wanderer', who is an individual that "sets his own course" (Cusack 2008, 25). He is not alone however, because as he embodies one 'Geselle' he is from time to time visited by "non-dogmatic and self-effacing emissaries" (ibid., 25) who act as mentors. This reflection clarifies the figures of the moving character immersed in a process of "natural pedagogy", as Cusack describes it.

The correct path is one appropriate to the individual's nature, that is, the unique set of faculties and dispositions with which every human individual is born. [...] Goethe holds that human faculties are essential, and that, accordingly, they can be helpful to develop. What is imagined in the *Lehrjahre* is a pedagogy that will make this possible, that will allow the full exfoliation of the individual character without doing violence to it. So, what is envisaged is a *natural pedagogy*, the logical model that is the unfettered journey. Wandering, in its narrow sense of walking, is the characteristic the *self-directed activity* of humans; it is the analogue of growth, the self-development of plants (Cusack 2008, 26).

As a social movement, the impact created in Humboldt's times remained. G. Biesta (2003, 63) in his historical recount on *Bildung*, indicates that it was during the '60s that the concept lost its presence in the educational debate and was succeeded by psychological and sociological approaches. This fact makes sense since authors such as Zimmerman and Schunk (2002, 106) report that it was in the late 1950s that educational psychology switched from a behavioural to a cognitive and cultural-based perspective, when learning theories developed by influential figures such as John Dewey, Lev Vygotsky and Jean Piaget flourished and were adopted by large groups in modern society.

Biesta affirms that it was in the '80s when awareness of the concept of general education

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<sup>99</sup> Wilhelm Meisters Lehrjahre (*Wilhelm Meister's Apprenticeship*) was published in 1795 and its sequel, Wilhelm Meisters Wanderjahre (*Wilhelm Meister's Journeyman Years*) appeared in 1821.

(‘*allgemeine Bildung*’ or ‘*Allgemeinbildung*’) placed the old *Bildung* debate back into the limelight, this time in a simplistic and instrumental way however.

To illustrate it, the author brings up United States educator Eric Donald Hirsch, who (it was 1986) came up with a compilation of basic skills every citizen in the country was supposed to have in order to be culturally literate. Biesta concludes his idea stating that as it was the case in the US, in many other countries around the world the question of general education emerged following this narrow-minded trend, where the idea of ‘*institution of national curricula*’ entered the scene as the ‘*centralist conception of education*,’ (G. Biesta 2003, 63), no longer interested in the necessities of the student but supporting applied sciences and excluding the idea of life-long learning (Cowen 1996, 255).

In modern terms, Harmut von Hentig raised his argument towards an educational design following the *Bildung* approach. In his “useful experience of being of service”, the pedagogue offers a concrete suggestion in favour of the German educational system. His offer is indicated for students aged 13, 14 and 15 years old, who by the time of their high school term are encouraged to join in practical tasks to benefit each of their communities. Without *Bildung*, von Hentig forewarns in the following way:

If we weren’t to take a new view (perspective) to include both sides (worlds):  
learning with and without the institution *school* -that is continue adopting *Bildung*-  
beyond the studies of the OECD (*Organization for Economic Co-operation and  
development*) to then participate young generations in society tasks and promises,  
this is so tho say something like allowing them in *probation* within the community  
and for that must we continue listening the awful news already there (Hentig 2006)  
10 own translation<sup>100</sup>).

To think of an individual in such conditions, continued Biesta (2003), is to think of a citizen with the capacity to acquire a rational autonomy, a person able to access a *Bildung* hence becoming a subject that transcends himself, in a continuous search for a ‘*general*, away from his limited self, him as a local spot. It is here that the author proposes to think of this ‘general’ layer in terms of the ‘*general knowledge*’, the common ground where all of these citizens are headed. But how do we understand and agree on a view of generalities that are ‘equally valid for everyone everywhere’? Here, I must warn you: one has to be cautious since to comprehend the density of a concept such as

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100 “Wenn wir nicht einen neuen Blick auf beides nehmen: auf das Lernen mit und ohne Schule, also »Bildung« weiter fassen, als das in den Studien der OECD\*\* [...] geschieht, und auf die Beteiligung der jungen Generation ab Aufgaben und Versprechungen der Gesellschaft, also ihr so etwas wie »Bewährung« in der Gemeinschaft ermöglichen, werden wir die hässlichen Nachrichten weiter hören müssen.”

'knowledge' is a journey in constant risk of reductionist views and epistemological cages<sup>101</sup>.

Driven by the influence of *Bildung*, Biesta promotes the understanding of *knowledge* in terms of a *network approach*, a framework well developed by Bruno Latour in his construction of *anthropology* of science (G. Biesta 2003, 64). For him, using this platform we can study the apparent success of modern technology, but as a counterpoint, question this epistemological interpretation where technology is seen as successful and omnipresent (ibid., 68). This is a promising approach pertinent to the university in times of digital media.

The »network approach« presents the general as an asymmetrical expansion of the local. To explain it, Biesta takes up Latour's idea of a "universal presence of techno-science", where instead of explaining the technological and scientific success not as the transformation of the world into a global laboratory, but the multiplication of laboratory as "points", all of those nodes that are either places, locations or people that now "become incorporated into a network where the illusion of movement and the illusion of universality arises" (G. Biesta 2003, 69). This viewpoint in connection with Wenger's communities of practice becomes very relevant for my topic, where a link is already provided close to his closing ideas. There, Biesta expresses that seeing knowledge through the *network approach*, entitles us to explore different dimensions of relations in a "world as a plurality of local practices" (ibid., 70).

This illustration presented by Biesta, contains to a fair extent the spirit of the *Bildung* idea of human elevation. Using contrasting perspectives –some might say dialectics– movement fosters the recursive question, new opportunities to imagine, to think beyond. For Biesta, this movement between observing and questioning, represents a switch to embracing *asymmetries*, and considers that the "real equality of opportunity has nothing to do with uniformity, but should be concerned with cutting through the very networks that keep impeding asymmetries in place" (ibid., 73).

With Biesta, we approach knowledge in a helpful way to properly comprehend further reflections that enfold the spirit of *Bildung*.

Rather than thinking of education in temporal terms – that is, as having to do with the tension between what is and what is not *yet* – we suggest that the proper place of education is to be found in the tension between 'what is' and 'what is not'. Such an 'atemporal' understanding of education can make clear what happens when one

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**101** In February 2010, the IV International Congress on Transdisciplinarity, Complexity and Ecoliteracy took place at the Universidad de Costa Rica. During one of her public presentations, Prof. Dr. Maria Cândida Moraes used the term to raise a critical view on how we learn and create knowledge within academic culture. She claims that it is necessary to let go of fixed epistemological structures in order to enhance our 'educative conscious as teachers', but go even further in order to 'transform our thoughts, our habits, values, attitudes and lifestyles'. She affirms that such measures are necessary 'not only to continue developing our cognitive processes, but also for peace, health, harmony, social justice and to rediscover those ideals we profess.'

leaves the tension between ‘what is’ and ‘what is not’ and configures education either in terms of what is *or* in terms of what is not. (G. Biesta and Säfström 2011, 541)

In Thomas and Brown’s (2011) reflections, they remark on the importance of learning as an inquiry process, where motivation drives the educational setup to access a set of constraints that make the learning meaningful. For that, they invite the reader to imagine a student who loves basketball while attending a physics class. Interested in getting his attention, the professor will probably think there is a better chance to teach key concepts such as gravity, force and acceleration by framing them within the context of that sport.

A question such as “*at what angle and with what force must a person shoot a ball to make a basket 20 feet?*” would be the traditional twist an educator would use in order to get the student involved in the topic. However, this question is nothing but cloaking a typical physics problem with a basketball theme. Instead of that, Thomas and Brown propose thinking of the “question a little differently: What is the best way to shoot a basketball.” According to their argument, if this student is truly motivated by the topic, he will be curious enough to create his own questions about his experience. Thinking of *Bildung*, it is rather clear that through freedom one can find oneself. A reflective human emerges without much effort when in contact with an immediate context, experiencing and living. Ito et al. (2013) describe the *shared purpose* core within the Connected Learning frame in the following way:

Learning and cognition “in the wild” also tends to happen in social and collaborative contexts where individuals work together, share knowledge, and engage in joint inquiry. (Ito et al. 2013, 74)

With this idea –explicitly borrowed from Edwin Hutchins in his 1996 book *Cognition in the Wild*– an interesting conclusion is drawn as they connect the concept of “wild” within the social concept of learning, since “everyday learning outside of school generally happens as a part of engaging in an activity or goal that is not explicitly educational” (Ito et al. 2013, 74), stressing always the importance of cross-generational connections. For this, their first design principle on –everyone can participate– stresses the importance of membership in every possible way to enhance an active flow of actions, keeping barriers to entry low thus offering opportunities specially to newbies by lurking and leeching (i.e. observe and borrow) (ibid., 79).



### 3.9. GLOBAL REMARKS

In this section I have presented a selection of viewpoints to explain the act of *learning*. Starting from the traditional place known as the classroom, I have highlighted the case of *higher education* and the importance of *teaching* as a situated enterprise.

In terms of general challenges, some issues related to Latin America are indicated, among them a lack of clarity around terminology traditionally linked to ICTs or the idea of development and its changing meaning as seen by *soft-system thinkers*, *hard-system thinkers* and *dialectical thinkers*. Moreover, I put up various details to explain human learning as a natural act ungovernable by higher education, yet limited by its bureaucratic character.

Relevant for this thesis, I have characterized the social concept in different ways. First, Weibel's *post-medial condition* was unveiled to illustrate the current social configuration, complemented by Bauman's idea on *liquid modernity* which later is taken up by Barnett to explain the *liquid university*. One section has been dedicated to extensively explaining the notion of space closer to what Bollnow designates as *experienced space*. It is shown in contrast with the image of place. Because of its relevance to higher education, I have stated that "a classroom is conceptualized as the *place* designed to contain the *space* of learning of students" (p.132).

Another dimension covered is connected to the *natural way of learning*. Furthermore, I have reviewed historical aspects to provide some background, but I have also used key terms in its association, such as *leisure*, *change*, *action*, *negotiation of meanings*, *participation*, *curiosity*, *expansion*, *confabulation* and *cultivation*.

I broaden this chapter with discussions on approaches to the idea of knowledge. Among them, *practice-based approach* and *everyday cognition* (Henning, see p.109), *explicit* and *tacit dimensions* (Polanyi, see p.110) and *academic knowledge* and *everywhere knowledge* (Laurillard, see p.159).

Moreover, I extended some debates in the light of von Glasersfeld's learning theory.

Complementarily, concepts such as *indwelling* (Thomas and Brown see p.110) and the notion of *change* present in Lave (see p.113), Thomas and Brown (see p.125), Barnett (see p.127) were included. Close to the end, I delved into the idea of *Bildung* (see p.171) as conceived during times of Humboldt and Goethe. Taking up several reflections expressed by Biesta (see p.174), I commented on its relevance to universities, with special importance around conceptualizations such as the *network approach* (see p.175). Framed in this discussion, I added more meanings about the 'Wanderer' as a symbol within *Bildung* (see p.173).

On the other hand, to introduce higher education I have focused on the *traditional* and the *far-*

*sighted* idea of it. Throughout this section, several remarks of contextual nature that refer to the situation and viewpoint at The Universidad de Costa Rica were associated. In the case of the traditional approach, I presented Barnett and his consideration of universities as entities in constant change and development, underscoring his claim about a *corporate university* (see p.163).

Then, teaching as a burden has been discussed mainly after Laurillard's claims, identifying teaching as a *second-order type* of approach for learning (see p.160). I introduce the notion of *teachers* as professionals in specific fields unable to recognize themselves primarily as educators, all of them responsible of complex processes that attempt, without any certainty, to influence learning within students. *Conversation* and *rhetorical* possibilities have been featured as one of the teaching perspectives professors at universities should consider, in benefit of their constrained students (see p.167). To complement these thoughts, Hall's debate on proxemic theory is associated to exhibit the place of learning at higher education (see p.155). Moreover, Bigg's remarks on *deep* and *surface approaches* for *learning* were featured (see p.160). Other appropriate conceptions such as *massification*, *mobility*, *innovation* and *creativity* were discussed, these last two within the arena of *design*, a concept elaborated along John Maeda's viewpoint (see p.164).

Lastly, I set forth some *imaginative* ideas about the role of universities. Within this framework, Jean Lave's opinions on *apprenticeship* and her notion of *everyday life* and practice become fundamental on the one hand (see p.111), close to Etienne Wenger's argumentation around *communities of practice* (see p.141). Complementary to their works, I put up their joint development on the concept of *Legitimate Peripheral Participation* (see p.114). These theory's stances were complemented with some remarks on *expanded learning* and the idea of *activity* as seen in Engeström. (see p.119). Importantly, *boundary objects* in the work of Star are featured as well (see p.146).

Moreover, the concept of *learners* has been introduced in relation to Thomas and Brown's reflection on *Homo Sapiens*, *Homo Faber* and *Homo Ludens* (see p.126). To close my argument, in order to create an accent related to space, I have elaborated the idea of *Homo Viator* as explained by Bollnow (see p.136) Finally I have presented the concept of *performativity* in connection with the teacher's *role* (see p.169):

"It takes time to modify habitual attitudes and expectations" (von Glasersfeld 1996, 177).

In many ways, most of these theoretical bodies contain decisive ideas that I consider fundamental considerations in the realm of education. While the literature suggests that institutions, current educational structures and decision makers are aware of the importance of these discussions behind

our contexts, how seriously is the educational sector incorporating these findings? To what extent are decisions being met in full appreciation of learning processes in terms of space? In the next chapter I will close my theoretical foundations by presenting certain perspectives of teaching and the space of learning in times of digital media.

# PART 2 – Reflecting in Context

## Chapter 4: Space as an educational approach / More wheres, less whats

Myths provide ways of comprehending experience; they give order to our lives. Like metaphors, myths are necessary for making sense of what goes on around us. All cultures have myths, and people cannot function without myth any more than they can function without metaphor. And just as we often take the metaphors of our own culture as truths, so we often take the myths of our own culture as truths.

(Lakoff and Johnson 2003: 185-186)

In 1948, Norbert Wiener wrote *Cybernetics or Control and Communication in the Animal and the Machine*. In it, he dedicated a chapter “on Learning and Self-Reproducing Machines” to announce that both learning and the “power to reproduce” are phenomena not exclusive to living systems, but also for “man-made machines” (Wiener 1965, 170). For this claim, he made use of different metaphors.

Wiener remembered the *golemic myth* (see p.74) as an instance, to illustrate the idea of a *learning man-made machine* able not only to operate with data and information, but also to store and access combinations in order to improve its mechanism, and execute a task. Next to this comparison, Wiener used another one, describing the kind of learning that happened if a machine were made to play *chess*, something akin to war, the sort of *game played by humankind* (Wiener 1965, 171).

But Wiener wasn't naive. He was aware of the kind of learning in his announcement, one of an operational kind (see p.75). As one of the several scientists who contributed to the development of World War II, his perspective remained aware of the difference between men and machines, in fact, offering a warning about our admiration of science and technology. To do this, he made use of three different *fables* where magical artifacts worked counterproductively against humans who unmindful of hidden literalism expected a totally different result with their use. In the featured quote, Wiener talks of

the “ghost knocking at our door”, referring to W.W. Jacobs’ monkey’s paw fable, where a man after monetary ambition ignorant of the price to be paid, uses a magical object that causes his son’s death. Grievous, he wishes to have him back. There and then, he hears knocks on the door. Not the son, but his ghost returns:

“The new and real agencies of the learning machine are also literal-minded. If we program a machine for winning a war, we must think well what we mean by winning. [...] We cannot expect the machine to follow us in those prejudices and emotional compromises by which we enable ourselves to call destruction by the name of victory. If we ask for victory and do not know what we mean by it, we shall find the ghost knocking at our door” (Wiener 1965, 177).

Computers and machines in general can be explained in many ways, but for the sake of this thesis I have chosen to explain them in the light of *metaphors*. The relation between computers and metaphors is depicted by authors like Carroll and Mack (1985); Erickson (1993), and Colburn and Shute (2008), among others. However it is with Alan Kay in 1970 that one known analogy took shape. It was produced to bridge computing machines and non-specialists, most of them known as *end users*.

The Desktop metaphor was conceived by Kay while part of the Learning Research Group at Xerox PARC (Palo Alto Research Centre); where they came up with a historical contribution after designing software capable of placing on computer monitors a system of graphic representations, all of them inspired by objects of the *everyday* at our desktops. Following a logic that can be fully known exclusively through our *experiential interface* in the outer world, algorithmic signs emerged inspired by powerful metaphors that are part of life routines, pervasive in most of our digital gadgets. Lakoff and Johnson present a useful reflection on this issue:

“Because so many of the concepts that are important to us are either abstract or not clearly delineated in our experience (emotions, ideas, time, etc.), we need to get a grasp on them by means of other concepts that we understand in clearer terms (spatial orientations, objects, etc.). This need leads to a metaphorical definition in our conceptual system” (Lakoff and Johnson 2003, 115).

“Mimicking” in media, close to the concept of *imitation* (see p.49), is an important procedure as it aims to produce abstracted signs perceivable by humans to be recognized as natural phenomena in its absence. This is noted by (J. David Bolter and Grusin 2000, 69) when they express that “[...] computer graphics, paint programs borrowed techniques and names from manual painting or graphic design

practices: paintbrush, airbrush, color palette, filters, and so on.” The »Graphical User Interface« (GUI) became perceivable out of a metaphor based on intuition and imagination, aiming for a *common arena* for humans, regardless of their different perspectives and beliefs. The process of discovering the *computer* as a medium beyond a *tool* (see p.42) was fundamental to this development.

Kay (2001, 122) reports that Kay’s path is well represented in his celebrated expression “doing with images makes symbols”. It is known that Kay believed that knowledge was something close to intuitiveness, a word that refers to something “without conscious reasoning” (Oxford Dictionary 2013), a belief that drove him in the process of creating images.

After exploring kinesthesia, he then turned to icons (Kay 2001, 126). For this he studied Jean Piaget, Seymour Papert and Jerome Bruner, all interested in the learning process within the child’s mind. *The desktop metaphor* was indeed exciting; however, as it is with the nature of metaphors, it carried a threatening nature to be aware of. Sociologist Sherry Turkle, another academic well aware of Piaget’s psychology approach and programming environments, wrote in 1997 in terms of “seeing through computers”. There she raised some critical remarks about this facet of computers. For her, Graphical User Interfaces hid the “bare machine” under an opaque interface, which was not the best option for realms-like education, as it “put a premium on the manipulation of a surface simulation” instead of allowing people to “see how to make it work”. Computer education responsibility in terms of Turkle, means teaching “students to interrogate simulations” (Turkle 1997, 77).

Silently, the “user metaphor” grew out of hesitation finding no resistance. How many disciplines and research efforts blossomed out of it? Perhaps this neglect finds its explanation in Weibel’s *Algorithmic revolution*, ignored for many years.

Before continuing further with my argument, I want to raise some awareness of previous discussions presented in this thesis, and how we come to this point: a journey between two areas of knowledge, both claiming to share a relation of some kind in order to construct *spaces of learning*. To understand this correspondence, *perspectives* were introduced as the chosen vehicle for learning.

First, *Learning by Wandering: a metaphor for changing perspectives*, was presented. This story focuses attention on the ‘Wanderjahre’ [Journeyman Years] of the ‘Geselle’ [apprentice], a traditional journey framed for centuries within the General Education structure of crafts and guilds in certain European countries. It is portrayed as the resemblance of a *wandering* figure that approaches *spaces of learning*, just like students at universities have their *space of learning* in times of *digital media*. Within this metaphor, relevant concepts are depicted to construct various debates throughout this manuscript.

Secondly, the field of *digital media* became a centre of interest. Among diverse viewpoints to choose

from, our attention focused on the *mechanistic* ideal towards *knowledge*, an approach that fosters the understanding of natural phenomena by demystifying it, that is, using rational methods grounded in *mental processes* such as fragmentation and analysis.

One could even say that *rational thinking* takes place in *mobile minds* without any support from *mobile bodies*. In this setting our corporeal senses are deceivable and for this, we manufacture mediums of different kinds since our bodies favor the image of a true world. This is necessary not only to explain the *outside world* precisely, but also to predict it. Here, humans are in control. Founded on these principles, the *computing machine* appears and after *remediation* processes it adopts a newer shape: the transparent *automaton*. A ubiquitous, almost invisible *medium* that is able to operate data and information in the most efficient way, like no person will ever be able to do.

In the second section of this thesis, the analytic *perspective* is contrasted with the *romantic* ideal of knowledge, central to exploring a *holistic* viewpoint of mankind. This approach explains how it is that people live and *learn* within contexts. Impossible to do differently, the mysterious act of reflecting happens in *action* through our bodies, which is an *experiential interface* we need in order to engage in social activities and to continue becoming.

This kind of *poetic imagination* takes place in *mobile bodies* with *mobile minds*. It is a struggle to confront the uncertainty of the *outer space*, embracing failure as a natural event for the act of learning. Since phenomena are ambiguous and deceitful, we can only understand them in ceaseless movement. Humans aren't in control; individually we interpret and construct unique descriptions of the environment. Aware of these assumptions, *education* emerges to assist humans to make sense of natural phenomena and among different structures *universities* are taking approaches like *Bildung* in consideration. It is an opaque medium that in times of digital media persists in influencing natural *learning* within students, hoping to cast light on their knowledge of the world.

University is an opaque medium because students are fully aware of its presence. In need of learning about certain aspects, they act according to the presence of concrete rules: as long as they match criteria previously defined, they get a place in this bureaucratic structure, a very hierarchical medium that unfolds further into subprograms and intricate sets of rules to follow. At the Universidad de Costa Rica, educational actions are meant to contribute to social transformations needed to achieve the common good, embracing diversity, study, meditation, artistic creation and the diffusion of knowledge (Consejo Universitario 2005, 1).

These romantic principles are aspired to within a mechanistic organization "comprised of faculties, schools, departments, sections, regional campuses, institutes and research centres, experimental stations, special research dependencies, research support dependencies, and administrative and

technical services at the Ciudad Universitaria “Rodrigo Facio” and other regions” (Consejo Universitario 2005, 2 *own translation*<sup>102</sup>) At the same time, more spaces are nested therein. One of them is the *space of learning*, which is traditionally bound to classrooms, laboratories or supervised visits. There, *teaching* takes place, a mediation activity with a known intention. Teaching is orchestrated by an educator, who at some universities is unable to identify himself as such (Francis Salazar and Piedra García 2009). Enveloping this figure, the medium university attempts to fulfill its humanistic promise.

Education found a new powerful tool in digital media to reinforce the bureaucratic system. During the ‘80s, society embraced digital media within their educational structures as they saw a great opportunity in computing machines. Costa Rica jumped on that wagon as well, adopting the “Programa Nacional de Informática Educativa (PRONIE)”, together with the Massachusetts Institute of Technology.<sup>103</sup> Children from some parts of the country attended computer labs where *computational thinking* was promoted. This approach was admirable, as the bare computer fostered capacities of abstraction and formalization fundamental to creating knowledge.

However, automata continued its remediation process and adopted new shapes, a phenomenon known to McLuhan and Grusin, which became transparent through the “opaque interface” criticized by Turkle in 1997. A surface created for users, not learners; just like highways are for drivers, and not for wanderers. A powerful tool once applauded in classrooms –the place of immobile bodies with mobile minds–, became a menacing element in its new shape, fit for mobile bodies as well.

My interest so far, is to discuss mediation, and the actions that occur *in-between*, where the meadows of *ivory towers* of knowledge exist. To access mediation, one must wander over the surface. This is illustrated in the Muybridge & Stanford story (see p.64) since its relevance is not about the surface, namely the *chronophotographic sequence* technique and its impact on society, but about that instance when Eadweard Muybridge confronts a problem in the *outside world* and, unable to solve it with his bare eyes and intellect, he manufactures a tool to enhance his perception. Now he can reflect in a richer way, thus avoiding the *illusion of encoded information*.

Studying the *chronophotographic sequence*, enables me to learn about the description of a problem created by a given tool, yet it does not allow me to learn about the problem itself. Similarly, with Marcel Duchamp, (see p.37) we must go beyond the artist’s work, because the creative act is only completed when the spectator interprets the inner qualifications presented on its surface. Frieder Nake,

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102 Artículo 8.- La Universidad de Costa Rica está constituida por facultades, escuelas, departamentos, secciones, sedes regionales, institutos y centros de investigación, estaciones experimentales, unidades especiales de investigación, y unidades de apoyo a la investigación, y servicios administrativos y técnicos, ubicados en la Ciudad Universitaria “Rodrigo Facio” y en otras regiones que fuesen escogidas por la Institución para el mejor cumplimiento de sus funciones.

103 In section 5.1. I comment further about these national details.



clarifies that focusing attention on the surface of any program is trivial, as the new idea is “to be found in the infinite class of works a program may generate, and not in the individual pieces that only represent the class” (Nake 2012, 64).

Comparable is the message on knowledge offered by Jean Lave, who highlights the need to observe beyond the surface of others *through* and *with respect of others* to be able to learn, or in Bollnow, who evokes the difference of the *outside world* when stepping out of the house instead of seeing it through a glass window (see p.139). And doesn't the 'Geselle' go beyond the surface of home and onto the path of uncertainty to learn? Barnett describes universities in the same way, in terms of a *surface* and a *deeper level*:

On the surface, this is an anarchic institution, awash with competing perspectives. At a deeper level, however, the university hangs onto its title of 'university' through its adherence to norms of social reasoning. The anarchy is to be found at one level, the surface level; the culture is to be found at a deeper level, at a foundational level. Culture and anarchy can coexist after all (Barnett 2010, 92).

In Barnett's conjunction of surface and deeper level, culture and anarchy construct the “picture of the university”, contained there but not to be seen simultaneously. In culture, Barnett identifies stability whereas anarchy is about unpredictability (Barnett 2010, 93). This is precisely the relation we obtain from *practical* and *theoretical* knowledge, a tension to be found in *academic* and *everyday* knowledge, presented by Laurillard. Going beyond the surface of digital media and higher education, means that we are aware of the world described in their surfaces through our *experiential interface*, but at the same time we are actively aware of the approaches necessary to create their description of the world.

In the standards of automata we will always find efficiency and certainty of operational processes. This robust *metaphor machine* is able to augment the limited possibility of humans when processing information. Automata are specially good at reckoning changes, and through their constant remediation processes, their range of speed is unlimited. They are the most advanced bureaucrats our civilization has ever seen. However, it is clear that a computing machine, formal and literal, deals with descriptions of the world that are implanted mechanically into the automaton hardware. These descriptions are elaborated out of coded signs, that is, man-defined abstractions previously indicated, restrict them thereafter. Automata perform according to the instructions dictated by precise software, a limited range of interpretations that trigger certain protocols. Hence, computer understanding of learning is reduced to its operational capacities. This was Wiener's message.

University teaching, on the other hand, is a bureaucratic structure run by human beings, therefore

neither as efficient nor certain in its goal. This place intends to transform students' knowledge of the world. Teachers offer descriptions of their experience with natural phenomena, *lively spaces* where they create individual knowledge while blossoming in society. It is important to keep in mind that, different from the kind of information implanted in automata, humans perceive and learn with their corporeal senses, reflecting and participating. This *experiential space* is immeasurably rich in comparison to the operative possibility computers have. As teachers, they attempt to convince students of better ways of how to learn about the outer world and for this they use descriptions that match the richness collected through their *experiential interface*, necessary to construct their unique knowledge. Descriptions offered at universities emerge as language, symbols, diagrams or pictures (Laurillard 1993, 58), something that makes university teaching a *rhetorical activity*. It is crucial that our possibility to create knowledge out of these representations is always tied to our knowledge of spaces.

When digital media is used to represent descriptions of natural phenomena, students deal with descriptions that emerge from literal machines. Yet, to learn about the *outer world* humans must knit their experience of it to create knowledge, in their social and sensorial possibility, while reflecting and participating. The more we experience the outer world, the more possibilities to create relations to represent and recognize one will have. For this, *information* is fundamental because as Laurillard (1993, 122) mentions, it "is the unit of currency" for us to later construct an intricate and unpredictable network towards knowledge. This selection of fragments relevant to an individual's knowledge construction are comparable to the 'Geschenk' (see p.104) a 'Geselle' obtains at the beginning of his journey, clues to finding a safe path in case of menaces on the road.

I have pointed out that one of the issues in analyzing teaching, is that universities are bureaucratic structures constraining organic structures. On the one hand, they benefit from the unlimited speed automata have. Processes are faster and need to be executed by humans, a feature that has significant impact on their *experiential space*, now occupied by the intricate process of universities as corporations. On the other hand, when prevented from experiencing the outer world, humans reduce their possibilities to go beyond surfaces and create powerful metaphors, indifferent to any representation. In the case of an educator, if he were an avid reader or conference participant, his metaphors would describe what is known by others about natural phenomena, yet he would be unable to describe how phenomena is experienced. This position is always risky in teaching, because the possibilities to create unique and lively information rely on the possibilities of humans as *performers*, and as we have discussed, the performers' possibility is associated with *self-confidence* and *experience*.

The information in the algorithmic sign is exciting, because in no time, it could have infinite similar references to one single question, whereas a university teacher remains limited, unable to cope with

and process information to match the computer. In digital media we find the *metaphor machine*, enriched with data and information made by others from their experience of the world. This is Laurillard's approach of *many-one*, (see p.45) needed for massification in education. Automata reckon efficiently all of this, with unlimited speed. In the presence of unlimited metaphors we strengthen our minds' mobility. However, it is good to keep in mind Laurillard's reflection on this issue:

[...] it is nothing more than a small but beautifully connected library, and on the other hand, by its very nature, it undermines the structure of the 'texts' it uses and reduces knowledge to fragments of information (Laurillard 1993, 122).

*Bildung* is a *one-one* approach. It can be similar to the lively descriptions offered by the 'Geselle' at the end of his trip, full of details, enable to create rich signs with different textures, full of poetry and imagination because the experience through his senses is holistic. People gather around and listen. It is comparable to the excitement people have when someone comes home after a trip. We wait excited to hear about his experiences, new lively descriptions that he engaged with in the *outer world*, the place we perceive beyond the surface of a window. A big issue in teaching in *classrooms-as-containers*, (see p.108) is that it seems to be fixated on the idea of people as *immobile bodies* with *mobile minds*. However, this can be strongly debated if the *experiential spaces* of students and teachers get reduced. Not even *mobile*, more like *limited minds*. In digital media, the surface creates the illusion of mental mobility and immediacy. In this way, we think of computers like windows of a house, and we stare through them. Imagining.

For humans, the rich description that emerges from the space of learning comes tied to movement in dialectical systems. To match natural learning, university teaching may find a way of growing closer to curiosity and reflection, enabling humans as *Homo-Sapiens*, *Homo-Faber*, *Homo-Ludens* and *Homo-Viator* to experience the space of learning in altering roles, participating, negotiating meanings, confabulating and embracing unexpected failure. This is the possibility of imagination, the mysterious act of reflection, where uncertainty dwells. This is an unknown field for computers, and uninterpretable for automata. Digital media will remain limited within the computable, infinite in the algorithmic; unable to engage in an "experience of participation" (Wenger 2000, 136). In Perry's words:

"We can provide, we can design opportunities. We can create settings in which students who are ready will be more likely to make new kinds of sense" Perry (1985, 16).

Highlighting once again Dahlbom and Mathiassen's (1993) categories for organizational design, their three approaches may be useful in thinking of spaces of learning at institutions like universities, as a complex structure in academies that reunites altering designs in a fragmented fashion. While positioning ourselves in *hard-systems thinking* we are in constant "danger of getting trapped by our current means of representations, [...] easily confused with the belief that our representation is the true one" (Dahlbom and Mathiassen 1993, 52)." However, we are in constant doubt when assuming *soft-system thinking*, wherein we grant the utmost importance to interpretations and see the world as a bouquet of perspectives as we consider the creation of a connected discussion, committed to different methods.

However, soft systems aren't good for implementation. Therefore, we need a "list of negotiated requirements," clear ways to proceed and meet these requirements (ibid., 59). Finally, *dialectic-system thinking* relates to reality in the light of *changing contradictions*, where "the world, rather than people's perception of it, is our primary source of learning" (ibid., 62) and the key is found in *action*, fundamental to understanding our meanings of the world.

Authors also explain that assuming the dialectic system means that in constant struggle, it is necessary to see beyond hard and soft thinking, because the world in front of us borders on chaos, conflicts, foreign (ibid., 64). At the end of their reflection, Dahlbom and Mathiassen unveil three metaphors: a *hard-system thinker* takes pictures of the outer world, a *soft-system thinker* is a teacher and *dialectical thinkers* care change agents, political actors" (Dahlbom and Mathiassen 1993, 67).

Here *space* must still remain the cornerstone element around which other concepts in this thesis revolve. This stance may assist us in recognizing the relevance of *learning contexts* for *where* it is that learning naturally happens, throughout a constellation of practices and communities. While space is built together with the experience of our body in it, that which is perceived is certainly not of a neutral kind; it responds to a unique combination of matter or objects that infer some relationship to other objects or matter. This condition is well described by Gaines:

When we observe space as a sign, new ways of understanding are possible, and the meanings of things can be discussed as they pertain to our everyday lives. Immediate experiences in space tend to appear uniform because of a habit of seeing things from a limited perspective. Mediated space must be understood in consideration of multiple levels of representation (Gaines 2006, 174).

Space is also the notable element behind Goodyear's arguments, seeing two major shifts that are relevant to the future of educational research. "The first is a shift in our sense of the sites of education,

acknowledging ways in which learning activity is becoming more extensively distributed across different contexts. The second is a broadening of our conception of educational praxis, acknowledging the growing importance of design” (Goodyear 2011, 1).

## 4.1. STUTTGART, BERLIN, CHICAGO

A young mathematician in Stuttgart, a psychologist in Berlin, an educational reformer in Chicago.

For each of these characters, *learning* came to happen in intimate relation with their *experiential space*. Frieder Nake, Rudolf Arnheim and John Dewey are names that stand for important contributions. Either in algorithmic art, perceptual psychology and art, or progressive education and philosophy, they are to be remembered not for dwelling within the boundaries of their study areas, but for creating the nonexistent in the meadows between *ivory towers*.

They were intellectuals in the middle of action and reflection, back and forth, bearers of unconstrained imagination. In fact, they saw a world of dynamic relations, altering spaces and changing enterprises. In the case of Nake, his evidence is documented on surface, interface and subface. To achieve a mindful explanation, he relies particularly on space, necessary in order to clarify each concept. He describes carefully, but first starts by depicting the context around him, back in the days when he was a *wandering learner*:

I found myself caught in the great melting pot: studying mathematics, the queen of all mental efforts, experiencing the grandeur and joy of strict axiomatics, formal concepts, theorems, and proofs. From this comfortable centre to the left were Bense’s thrilling lectures about aesthetics, ontology and, particularly, semiotics; to the right was theoretical and experimental physics, or the theory of electrical engineering, and more.

What a time, what a storm! We were a group of friends, trying to understand what the engineering types told us as well as what came from those in the humanities. We felt more and more at home in mathematics and, soon enough, in its rather trivial offspring, computing. But now we were confronted with Snow’s claim that no communication was possible across the boundaries between the two types of disciplines we liked so much, because they were both exciting in their own way: the scientific and the literary cultures. It must have been puzzling to the young student who in the early morning was listening to a great electrical engineer, did his mathematics around noon, a bit of programming after lunch, and went to hear about

Peircean semiotics in the late afternoon, just before rushing away to the opening of some artist's exhibition" (Nake 2008b, 93).

In Nake's description, we see the strategy embraced by the gardener's apprentice (see p.165). Instead of focusing on the actual objects of interest, rushing us into a fragmented setting, he prefers to contemplate a *melting pot* of scenarios, like *points* in a *dynamic network*. A young Nake was immersed in the joy of pure rationalism, in the mental and formal exercise later to become fundamental to stripping the computing machine and comprehending its artistic value. Then he is the performer of bare words, chalk and blackboard, able to inspire others to learn about signs and interpretation referring to the *outer world*.

Later, he is social and confabulating meanings with others; all of them wandering at night in the middle of a late toast or enjoying a play at the local theatre, exploring the poetry of Tschechow. In his image, the excitement of learning emerges without constraints, he didn't *have* to attend any of these spaces. He was curious and driven by the *natural* and *lively* emergence of events. In Snow's critique the divide between scientists and artists in academia was alien for him. The agenda was dynamic and at times, unpredictable.

Rudolf Arnheim, some years before the mathematician, was another eager student interested in psychology. His testimony is elucidated with "The Little Owl on the Shoulder of Athene" (Behrens 1998), a metaphor Arnheim expressed about himself. Just like Nake, one of his first claims is related to the *space of learning*, one that became very relevant to the exploration of his career:

The Psychological Institute was a half-mile from the university in, of all places, two floors of the Imperial Palace, which had stood empty since the Kaiser's overthrow in 1918. The resulting makeshift laboratories were "very picturesque," Arnheim recalls, "with angels painted on the ceiling, and the marble bathtubs of the court ladies standing in these rooms, and that's where we did our experiments. What was so good about that psychology department was that it was a real workshop.... All of us students served as subjects for our neighbors, and they, in turn, were subjects for our experiments, and so you sat there and didn't go much to lectures. It was learning by workshop."

Life in Germany during the Weimar Republic, which began in 1919 and ended when the Nazis took control in 1933, was both exhilarating and precarious. It was an era of political and economic upheaval: "Anything that can be wrong with a society was wrong," Arnheim remembers, and "anything that could be right with a society was

right". But there were also astounding opportunities: he remembers attending performances of the provocative plays of Bertolt Brecht, seeing the first exhibitions of German Expressionist art and interviewing the Russian film director Sergei Eisenstein. He also bought for 50 cents first-edition copies of Sigmund Freud's books, which he still has (Behrens 1998, 231).

Notice in Arnheim, the conscientious description of interconnected spaces that may be relevant to his integral development. Prominently, the idea of "learning by workshop" tells of a disposition which is different to the classroom we saw in Germain's images (see p.94). At the Psychological Institute, members of different communities collaborated with each other; their roles altered from students, neighbors or experiment subjects. This workshop itself seemed to be a *boundary object*, just as Star and Griesemer (1989) expressed about museums and libraries. It was detached from the university where students, instead of attending lectures, preferred to remain there, perhaps feeling at home. Weren't they forced to attend to their official curricula? Instead, they preferred *learning by "workshopping,"* or attending Brecht's plays.

For both Arnheim and Nake, their engagement doesn't seem to be coerced by evaluation, official programs or timetables. This aspect is, according to McGregor, a determining factor throughout schools, where regulations manage the space and body dimensions of students, deciding on their access and their timing according to timetables. She points out that these kind of structures manage to regulate student's "movement and expected actions in particular space-times: the classroom before and during "break" is quite a different place" (McGregor 2003, 364).

In addition, in Arnheim it is possible to identify unity of knowledge with action. In the workshop, members *acted* within experiments but at the same time, *reflected* actively. This feature matches John Dewey's ideals in his understanding of education. He worked towards an educational project of unity between head and paper, which is for him to work in the concrete. Dewey's project was meant for children, but my main interest is to bring out his educational principle of *activeness*, otherwise for him education was "disembodied information, knowledge is cut off from the activity in which it has its meaning, and becomes a false abstraction" (Menand 2002, 322).

Dewey's attempt to achieve knowledge through the unity of freely doing and thinking, is very close to the *Bildung* approach. It is similar to the *spaces of learning* in Stuttgart and Berlin, which were influenced by Humboldt's idea of university. Was the *Dewey Laboratory School* influenced by the *Bildung* spirit as well? For some authors, Dewey's thinking certainly had connections with the German concept, specially through Hegel's concept of *Bildung*, where the importance of 'Selbsttätigkeit' [self-

activity] was emphasized (Good 2005, 14). For Dewey, activity is not only important but so are the whole, accessibility and equality. In Charlene Haddock Siegfried's words about the *Laboratory School* and the experience of children learning by experimenting "domestic pursuits" as highly valued forms of culture:

The respect for practical activity that Dewey expresses abstractly in his writings on inquiry is clearly and specifically manifested in the organization and work of the school; cooking and sewing are recognized as activities that employ the experimental method, and also as activities that hold an esteemed place in culture, thus warranting serious academic attention. [...]

Laird emphasizes that the Laboratory School was fully coeducational; boys and girls learned cooking and carpentry alongside each other, and no activities were restricted to one sex. But it was also coeducational – and cut across class lines as well – on a deeper level, because of its very inclusion of manual activity in the "academic" classroom" (Siegfried 2001, 249).

Part of the relevance of Dewey's space of learning lies in the elevation of human activities that historically played important roles in our social configuration. However, closer to a practical knowledge approach, they are mere *téchnes*, in Aristotle's terms, when compared to rational science.

Lave's position on this issue raises important questions, specially in the current configuration of education being categorized as formal, informal or technical (see p.113). Furthermore, with Dewey I find a pertinent opportunity to highlight the importance of imagination and metaphor. Thinking of children as cooks, carpenters or gardeners, becomes a powerful metaphor to foster the relevance of democracy, free individuals self-driven by questions about truth and wisdom. In a way, they behave like 'Gesellen' exploring their craft, appreciating and observing the poetry in material around them, intervening and experimenting, learning and raising more questions that emerge from the everyday. Science is there as well, in fact, for Dewey the *cooking class* was the key from where science was taught:

The philosophical rationale is obvious enough: preparing a meal (as opposed to, say, memorizing the multiplication table) is a goal-directed activity, it is a social activity, and it is an activity continuous with life outside school. But Dewey incorporated into the practical business of making lunch: arithmetic (weighing and measuring ingredients, with instruments the children made themselves), chemistry and physics (observing the process of combustion), biology (diet and digestion), geography



(exploring the natural environments of the plants and animals), and so on. [...] It turned out to have so much curricular potential that making cereal became a three-year continuous course of study for all children between the ages of six and eight... with (on the testimony of two teachers) “no sense of monotony on the part of either pupils or teacher.” And as *cooking* established continuity within the sphere of the home, other activities established continuities within the spheres of industry and business. There was much work, for example, with iron. The children built their own tiny smelters (Menand 2002, 323).

Menand portrays the progressive vision of Dewey, where education’s major challenge was to make “the learning indivisible from the doing”. Dwelling in the action of cooking turned to be a boundary object of great relevance and becomes an inspiring idea to explore further. It is a brilliant example of going beyond surfaces, seeing beyond the apparent. In the natural action – the boundary object-children and teachers met. Alike von Hentig’s ‘Jugendschiffe’, (see p.107) learners discovered in cooking layers of specific knowledge to unfold, all of them approachable with rational thinking. Like ‘Gesellen’ discovering the world through techniques, their hands were one with their reflection.

Students as Homo Faber, perhaps close to Homo Ludens, were participating in a recurrent activity, designed to evoke many others like it, inside and outside their community of practice. The question wasn’t anymore about the what, instead the how or where appeared. In Menand’s portrayal, we see the hard-system thinking, the soft and the dialectical coexisting. Students had to meet a certain goal, they had to construct instruments and use arithmetic to measure natural phenomena in precise ways. Next to it, observing and interpreting was fundamental, in combustion or nature they could investigate such designs and lastly, they were agents of change while cooking together, male and females, defying a society afflicted by ethnic and gender division.

They were humans preparing their own food, refusing to be treated like children, shying away from reasoning and acting upon grown-up roles. The cooking class at Dewey’s institution featured the essence of “the tension between the fixed, reified, predetermined nature [...] and the transitional, expansive, unexpected” (Engeström 2014, 95).

In the “cooking metaphor” at Dewey’s Laboratory School, we may distinguish different educational episodes relevant to this thesis, ever reminding myself that teaching happens always with an intention or *telos*, as discussed by Biesta (see p.103). Based on the traditional design for university teaching scenarios previously discussed (see p.153), yet contrasting it with the idea of students as *wanderers* in their *spaces of learning*, I suggest analyzing the *cooking lab* as an educational strategy as shown in

Table 03.

For me, one of Dewey's great achievements with the cooking laboratory –as it was with other signatures at his laboratory school– is the artfulness of inquiring upon spaces, which as boundary objects, foster the idea of natural learning and activity. Inherent to such a scenario, contents must be confronted without being the focus of attention, a setup suggested by (Thomas and Brown 2010), Lave and Biesta.

Such a task requires the craftsmanship of a 'Meister', a performer with *practical wisdom*, a bearer of rich *trajectories* in the *outer world*, confident of seeing beyond the *surface*. In the *cooking metaphor* we encounter a suitable example that as a node, belongs to a network of possibilities, new activities, spaces, trajectories and members. This may have the same potential that Roger Schank (1995) reveals in his analysis, relating gastronomy to the idea of *education*,

If you want to know whether the sushi you had was typical of what sushi should taste like, you have to have sushi a second time. If you want to know the extent to which freshness matters in sushi, you have to eat sushi that isn't fresh and then eat some that is especially fresh. To gain this experience in a restaurant means asking about when the sushi was made, when the fish was bought, when it was caught, and so on (Schank 1995).

Just as with the "Learning by Wandering" metaphor, the 'Geselle' wanders his experiential journey and while on it, he gets to know in movement, reflecting and interpreting. These actions become crucial events that aren't to be conceived separately from the organic nature he belongs to and by which he is surrounded. Schank continues in his reflection:

In short, learning about food means eating it, thinking about what you ate, eating things like what you have already eaten in order to contrast one experience with another, and asking questions to determine other information that may help you make sense of your experiences. Still, this doesn't tell us exactly what it is that we are learning when we are learning by doing. It does tell us one important thing we are doing, however. We are acquiring experience. Experiences, or cases, are a critical element in understanding what is learned when one learns by doing (Schank 1995).

To explore further the importance of powerful metaphors, let's delve into the *cooking* concept, just to keep imagining new points of connection in the meadows of distinct knowledge throughout history. What is interesting is that if we were to take up today the gastronomic topic, it would be agreeable to think of it as a valid discussion for many.

Throughout politics, arts, economy and biology, the food industry and cooking cultures around the globe become a *boundary object* to meet, as they contains layers of information, going back to about

DIDACTIC STRATEGY FORMAL EDUCATION / 'Wanderjahre'	LEARNING BY DOING / <i>wandering</i>
Teaching goal / <i>Telos</i> :	Learn sciences
Didactic strategy / <i>Space of learning</i> :	Constellation of interconnected spaces relevant to "preparing a meal", which is a boundary object. Continuous, diverse and exciting enterprises for all members within the community of practice.
Learner's role / 'Geselle':	Newcomers and/or experienced members access a community of altering practices. They have access to a constellation of relevant communities.
Educator's role / 'Meister':	Longer trajectories of experience in <i>cooking</i> as a practice. Access to altering roles according to the emergent situations, attentive to include new activity spaces during the process.
Effectiveness of strategy / <i>Tools</i> :	Preparing a meal, a <i>goal-directed activity</i> , making use of the following tools, <i>formal operations</i> , e.g. arithmetic principles related to different unit systems, interpretation methods on combustion within chemistry and physics, reflecting on the processes around diet and digestion in terms of biology, and fieldwork methods related to observation, sampling techniques for recollection of ingredients and materials according to known theories in geography. Reflecting upon findings and discoveries; <i>practical activities</i> , e.g. creating customized measuring instruments, applying methods and techniques accordingly, performing altering roles in a common space, experimenting and perceiving phenomena through their senses (like tasting food, consuming goods, smelling and observing textures); <i>social activities</i> , e.g. choosing and buying ingredients in the market, negotiating meanings, performing known rituals like serving food, aesthetics at the table, looking at others' performances, discussing findings and discoveries; and <i>outside world</i> , e.g. as they experience their influence upon natural environments while applying techniques, reacting in front of emergent spaces.
Theoretical foundations / <i>Knowledge perspective</i>	Holistic ( <i>unity of doing and thinking</i> )
Relevance of the content for discipline and context role / <i>Outer world</i> :	Where the raw material exists and new activities emerge. Fundamental to obtain ingredients, to observe natural phenomena, and discover new points for an educational network.

Table 03. Dewey's Lab School: the cooking lab as an educational strategy

the same time as Dewey and his *Laboratory School*. This was the same time when activist and lawyer Bolton Hall included in the foreword of *Three Acres and Liberty* that "teaching is but another department of gardening" (B. Hall 2003, 8).

He was then devoted to founding in USA the *back to the land movement*, studying it closely as it blossomed simultaneously in some European countries such as France, Germany and Switzerland, where they shared the belief of social mobility by helping families in need of a home and food

cultivation, (New York Times 1909). It was a context that brought them together without even trying. In the case of Neil Gershenfeld, Director of MIT's Center for Bits and Atoms, the topic came to be of importance as it was unveiled in one upcoming class that they entitled "How to Grow Almost Anything". Gershenfeld explains that with it, they promote the construction of "bio labs and then teach biotech in it." In his words, "what we're doing is making a new global kind of university" (Edge 2015). The metaphor even reached Alan Kay and in this case helped him to explain his defeat with the FLEX machine, back in the day:

But the combination of ingredients didn't gel. It was like trying to bake a pie from random ingredients in a kitchen: baloney instead of apples, ground-up Cheerios instead of flour, etc (Kay 2001, 124).

Moreover, recently a biologist took up this topic to inquire about human evolution bound with one feature: using fire to cook instead of eating raw food. In his book *Catching Fire: How Cooking Made Us Human* (2009), Richard Wrangham offers scientific evidence and historical substantiation to bring even closer the "trivial", everyday topic of eating as center of his evolution argument. There, he praises that moment when humans cooked, and became men. Wrangham explains it in the following way:

... cooking increases the amount of energy our bodies obtain from our food. The extra energy gave the first cooks biological advantages. They survived and reproduced better than before. Their genes spread. Their bodies responded by biologically adapting to cooked food, shaped by natural selection to take maximum advantage of the new diet. There were changes in anatomy, physiology, ecology, life history, psychology, and society. [...] right back at the beginning of our time on Earth, at the start of human evolution, by the habiline that became *Homo erectus* (Wrangham 2010, 14).

As shown, the topic becomes recurrent, a sign that with its meaning evokes another one. If we continue with this exercise, the spacious place Dewey's metaphor provides will expand, always allowing more spaces within, or different, shrinking back if that is necessary. *The cooking metaphor* is a goal-directed activity that is easily expandable, as preparing a meal calls for many spaces in connecting known activities. In *cooking* and eating, one finds an open instance, just like the meandering wanderer who confronts the landscape and encounters new perspectives with each step he takes. In communities of practice, only those members with their engagement will occupy the *space of learning*. It will be their construction, always in unique ways. Insofar is the joined action of *cooking*

different.

A last fundamental issue to discuss is that *cooking* is a medium of low »semioticity«<sup>104</sup>, because even if two people came together to prepare a same recipe with same ingredients, yet at the end, their dishes will be always different, just as learners come up with different outcomes at universities after processes. What we are looking for in our suggested structure, are spaces and actions with *low semioticity*, values able to be occupied with rich *lively spaces*.

This idea of *emergent spaces* can be traced within entrepreneur initiatives, as they have already materialized it with concepts such as the *Pop Up!* approach, referring to spaces that are occupied during short periods of time, open for those able, or willing to join and engage in a specific enterprise. This has been taken to create buzz-concepts such as Pop Up! universities, that claim to be different from the traditional university. Pozniak (2013) reports that they typify the higher education structure as a “normally slow moving beast”, for which places such as “Unrulyversity” are reported to “bridge the gap between business and academia”.

From Dewey’s vision we can expand into a number of possibilities and scenarios worth exploring. It is important to note that his philosophy had an impact on other regions like Costa Rica. It is known that his thoughts influenced the pioneering work of educators such as Omar Dengo and Emma Gamboa, the latter considered a political agent of change in favour of human rights, democracy and gender equality (Cubillo Paniagua 2010, 185). Gamboa earned an academic doctorate in 1951, exactly one year after women’s suffrage was granted in Costa Rica. Ávalos (2013). What faced her was a nation in change, unfamiliar with the role of women as leaders. Nonetheless, she became considered emblematic in the light of her contributions to the construction of a new society.

*Inspired by Dewey, Gamboa fully participated in the foundations of a new type of primary school in the country, the “Escuela Nueva Laboratorio”, the main objective which was to introduce the classroom as a laboratory, a place to experiment with new teaching methods (Cubillo Paniagua 2010, 185 own translation<sup>105</sup>)* This imaginative exercise of bringing the *non-mediated* everyday into the class, became a founding idea for Dewey and Gamboa’s Laboratory School projects.

Is this reflection also important for universities currently? To what extent? This is an important debate to have since current educational initiatives in higher education seem to favour certain

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104 *Semioticity* is a term I borrow from Prof. Dr. Frieder Nake. By it, he refers to the quality or capacity a thing has in order to evoke fixed meanings and defined conventions on attention. In terms of media, I personally create a relation with McLuhan’s idea of cool and hot media (see p.59).

105 [...] en 1960 doña Emma participó de lleno en la creación de la Escuela Nueva Laboratorio, cuyo objetivo primordial consistía en utilizar el aula como un laboratorio en el cual se pudiera experimentar con nuevos métodos de enseñanza.

segments of knowledge in detriment of others for the sole reason of pertinent applied-knowledge and production.

This scenario has been addressed by Gibbons et al (1994) when he foresaw that “to remain competitive, industry increasingly needs access to knowledge generated elsewhere. One avenue is to join with other firms in pre-competitive research. Such collaborations are still infrequent. For many reasons universities remain the preferred option” (Gibbons et al. 1994, 87). However, it is also mentioned that in such conjecture, institutions have not many options as their “need for external funding encourages professors, and hence universities to be responsive to societal demands” (ibid., 86). To what extent does this claim describe our current situation?

Dewey’s Cooking Lab, next to Nake and Arnheim’s cases, are all *experiential spaces*, metaphors with the capability of including new activities, spaces and connections, alternative configurations that may stand for classrooms at universities.

My intention while presenting them is to call attention to and unbalance this traditional notion of *classrooms* frequently focused on “whats” but letting go of “where”. Assuming it is an unobtrusive tool that we take implicitly for granted in our societies, metaphors are suggested by Dahlbom and Mathiassen (1993, 117) as “crisis-bringers”. By presenting metaphors, we might be able to unveil transparent media, for example, and transform instances into being perceptible –that is– dragging tools from the implicit back into explicit objects we attend to. In this case, I suggest the idea of metaphors as powerful cold mediums, in terms of McLuhan, as vehicles towards brokering actions in communities of practice.

## 4.2. A METAPHOR MACHINE FOR EXPANSE

The applications of science have built man a well-supplied house, and are teaching him to live healthily therein. They have enabled him to throw masses of people against one another with cruel weapons. They may yet allow him truly to encompass the great record and to grow in the wisdom of race experience. (Bush 1945, 124)

Norbert Wiener feared our lack of memory after determining events, war being specifically the one he had in mind. Like him, Vannevar Bush, another scientist, who in 1945 was Director of the Office of Scientific Research and Development of the United States of America, came up with an article and among arguments, he imagined a non-existent machine. The “Memex” was a device to support humans in their memory capability: an indexing machine to grasp not knowledge, but *wisdom* from *experience*. Bush considered the benefits for humanity if there were a possibility to continue extending records of

experience but this time, with the ability to consult them. Memory was his main objective. But just as good scientists, he also thought of it in a formal mechanistic way, in order to be able to consult these records “with exceeding speed and flexibility” (Bush 1945, 121).

In his words we still find the great opportunity we have in times of digital media. Vannevar Bush’s imaginative device was years after manufactured and named computer, because it computes, just like a calculator calculates. However, as we have studied in section one of this thesis, the features achieved by this tool after remediation processes created an opaque horizon for teaching environments, where we call upon *wisdom* after experience. Yet, this is a new and intricate tool that is precise and rapid, and continues its increasing speed hidden behind the opaque surface. Turkle (see p.182) comes about.

As tools, automata aren’t behaving in the way Illich described. Maybe because of his educator perspective, he thought of “tools to work with, rather than tools that “work” for” people” (Illich 1975, 23). For him, technology had the possibility to turn people into “well-programmed energy slaves” instead of “spending energy and imagination each one has” (ibid., 23). Certainly this is the case described in experiments such as the *Social Jetlag effect*, described by Roenneberg (see p.70).

These scientists study people’s lives being interrupted in their basic nature, for they develop sleep and weight disorders intimately associated to their technological uses. In such cases, their *experiential space* occupies a *place* dictated by the tool, instead of assisting them while working. Unaware of the *algorithmic revolution*, the body is constrained to the experience of using a machine with “enormous appetites” of data, as (Bush 1945, 116) announced when he imagined it. Human experience adopts the machine’s agenda, a trade in favour of productivity and effective methods. The trade isn’t neutral however. McLuhan extended this reflection close to the debate on the *mechanization of the mind* (see p.72):

The “censor” protects our central system of values, as it does our physical nervous system by simply cooling off the onset of experience a great deal. For many people, this cooling system brings on a lifelong state of psychic rigor mortis, or of somnambulism, particularly observable in periods of new technology (McLuhan 1994).

In view of the previous, shouldn’t we move this debate *away from the computer and beyond the computer*? As has been stated, the “new way of learning” isn’t focused on outcomes or replications, instead it happens in *dwelling*, the environment where learning is about *becoming* (see p.126). Similar to the ‘Geselle’ that carries basic instruments to help himself undertake and learn his craft, or Dewey’s children creating their customized tools, my interest goes beyond the futile discussion about

computing machines reduced to being good or bad at educational places.

It is undeniable that automata are powerful tools, specially if we see them as a *metaphor machine* (see p.85) with endless possibilities of association to the information we are in need of. Computers have the necessary characteristics to accompany the *telos* of university teaching, specially when they remain cold mediums, facilitating our reflection processes. For university teaching, computers should be *tools*, since *machines* and *automatons* aren't as useful. (see p.42).

This implicitly assumes that students and teachers, as members of communities of practice, do not profit much from tools that do things for them; it is more like they get assisted in their work and descriptions of the world by them. For teachers, a computer has all the potential to become a source of emergent and lively metaphors, if he is not entirely capable of gaining excitement already with his descriptions from experiencing the world. This is an important point to remember, because a teacher without metaphors is always in danger of turning the *space of learning* into *immobile bodies with limited minds* (Fig.11.).

On top of a weak bureaucrat, a fitter one emerges. If *university teaching* reduces itself to the world of information about the outside society, for each analog and outdated metaphor a teacher offers, *automata* are capable of presenting an infinite number of *windows* to look outside the house, now in real time (see p.137). In such conditions, digital media appears as a newer attempt to *heal* education in its limited *space of learning*. This can escalate with *Massive Open Online Courses* (MOOCs, see p.77) for instance, disrupting entirely the traditional classroom by *remediating* it into a series of algorithmic signs. In the presence of inefficient formalizations of information in classrooms, computers rise as a possible vehicle to support better descriptions of the knowledge others have constructed through their *experiential spaces*.

Let's take Minerva as an example, an educational structure that has been offering higher education since 2012. With a mixture of liberal arts and science education, they assure a "rigorous interdisciplinary curriculum, advanced learning technology, and immersive cultural experiences" while elite students do not have to attend "large introductory classes, nor lectures of any kind" (Minerva Schools 2015).

Students choose out of five interdisciplinary majors: arts and humanities, computational sciences, social sciences, natural sciences and business, each of them having "concentrations" with a profile of career possibilities they might aspire to after finishing their curriculum plan. The promised space of learning is described as intimate, full of direct interaction with professors and small groups of peers. Yet to access it, you need a computer with certain technical characteristics and an Internet connection.





Fig. 11. *The Dead Class*, by Tadeusz Kantor. This was a play and performance done in 1975, where Kantor himself plays the role of a teacher in front of dramatic actors that appeared in the role of lifeless students. Close to the end of the play, each actor replaces himself with a puppet. *Cracow*. (Kantor 2012)

Students are carefully selected, from any part of the world and if chosen, they will be living together around the planet in different residential locations in cities like Berlin, Buenos Aires, Seoul, Bangalore, London and Istanbul. They will spend one semester in each of these locations, right after their first year of studies in San Francisco.

While these travelling students are part of the Minerva program, their classes are held using their laptops and webcams. With an active connection to Internet, they log into proprietary software that remediates the experience of traditional activities inside a classroom or seminar, this time improved with different features according to the needs of the staff. The professors appear according to timetables that display on their devices, and each unit lesson is measured by time units (Fig. 12).

While these strategies may fit the idea of flexibility, mobility, standards and innovation, some reports describe the experience of this system as “good, but fascistic” (Wood 2014). Nevertheless, the meticulous Minerva plan is designed to prepare future leaders, while avoiding “excessive tuition, or wasting money on sports programs, classroom and office space, and lavish facilities for students” (Roush 2014). According to Ben Nelson, its creator:

The reason we can get away with the pedagogical *model* we have is because MOOCs exist. The MOOCs will eventually make lectures obsolete (Wood, 2014).



Fig.12. Collaborative documents, Enhanced office hours, Rapid breakout groups, Interactive discussions.

(Minerva Schools 2015)

Minerva's case is interesting insofar as it remediates the *medium* - or the *place*, in terms of Bollnow (see p.132) that contains each student's *space of learning*. In the sense of a university, it occurs inside a traditional classroom or laboratory, one that is nested within a study program of a faculty. Similar, both designs share a curriculum-based program, focusing attention on contents and implementing didactic strategies for teaching; yet, Minerva's novelty arises because of the importance of the "where", as their proposal takes place while students *change their bodily locations*.

In contrast, the 'Geselle' journey is oriented by a *map* of open possibilities, while students at Minerva must stick to a four-year plan decided in advance, carefully measured for them. *Minervians* – students at Minerva– will follow demarcated roads, stepping off their vehicles from time to time to enjoy the view. Soon they must resume their journey towards their destiny. As they cover this distance, they will never get to know someone like a 'Meister', nor his way of shaping material, because at Minerva the chosen structure of the *space of learning* is reduced to a high-definition *algorithmic sign* produced by a computer.

This sign represents the teacher's performance, which is happening somewhere away from their vicinity. There, he must perform in front of a different computer and teach with oral and written signs about his experience of natural phenomena, this while responding to another algorithmic sign being produced on the surface of his computer, which represents an audience. His teaching action may well be more difficult than the traditional *lecture* with chalk and a blackboard, since now it isn't only about the selection of utterances or drawings he makes, but at the same time he must operate mechanical

devices to indicate certain parameters to an automaton.

Accordingly, he manipulates the algorithmic sign that is transmitted to the audience in representation of his live performance, back onto the surface of each student's computer, frame after frame. All these actions are constrained within a segment of time, and as soon as they close their computers, students and teacher will dwell again in their lively spaces of learning, using their experiential interfaces in everyday environments. How are the Minerva algorithmic sign and altering everyday life in each of their cases connected? In this sense, Laurillard offers a warning:

There are some programs that masquerade as 'teaching programs' that are not adaptive, that simply set tasks on demand, give extrinsic feedback, and total a score of some kind. Cynics may claim this emulates normal teaching very well, and apologists defend it on the grounds that it gives students plenty of much-needed practice in certain kinds of tasks (Laurillard 1993, 148).

The path followed by the 'Geselle' is different. On the road, he learns together with the 'Meister' and other apprentices similar to him. They join around practices, and actively present their experiences as they get engaged beyond the surface of their home. They negotiate meanings, they confabulate and perform with their bodies as they dwell in skills. Their *space of learning* expands or shrinks accordingly with natural phenomena, social interaction or in the middle of reflection. After the 'Wanderjahre' the 'Geselle' will belong to a constellation of communities of practice, brothers and sisters in their skills and practices, making a living out of a natural impulse.

*Minervians* are shaped to become future leaders. The traditional classroom in Minerva is remediated to float ubiquitously, capable of reducing a student's *space of learning* away from everyday events, remotely, with the efficiency of a mechanical *beep*, a vibration or an algorithmic image that will pop up on their screens. In this new medium, the old one is contained. Students follow a curricular design, timetables and evaluations. Some new features are added, and for this they must operate certain mechanical combinations on their devices to push coded signs of computable appearance fit for the software. If performing a correct procedure, they create a symbol that stands for known actions they used to do with their bodies, like "raising the hand to ask a question".

In some of his final remarks about the Minerva initiative, Wood (2014) steps back to gain wider perspective about the general topic, that is, education for human beings. As he interviews Harry R. Lewis, a former dean of Harvard's undergraduate college, the experienced academic analyzes the "on-the-move" study program by opening with a pair of general questions that are fundamental to my debate, as it reminds us of the meaning of teaching, *away from the computer, beyond the computer*.

“What does it mean to be educated? [...] How do you improve the efficiency of growing up?” Wood (2014), still reporting on Lewis’s words, reminds us that education happens *wherever* students are able to witness scholars “working and plying their trades”, instead of “hydraulic metaphors”. Promoting the idea of education “is to increase the flow of knowledge into the student” (ibid).

### 4.3. LEARNING BY WANDERING

A university is a mansion with unlimited rooms, all of which have windows. Is the necessary courage present so as to pass through a window into the unknown? (Barnett 2010, 81)

There seems to be a consensus around the belief that humankind constructs knowledge between two main domains. Both are named differently depending on viewpoints, but in essence they refer to similar concepts. Either as theoretical and practical (Dahlbom and Mathiassen 1993), epistemological and physical, rational and poetic imagination (von Glasersfeld 1996) or academic and everyday knowledge (Laurillard 1993), they seem to be consistent with the differentiation reported by Snow’s (1962) two ivory towers of knowledge, Polanyi’s explicit and tacit dimensions (Thomas and Brown 2010), the contrasts of learning perspectives such as the surface and deep approaches according to Biggs and Tang (2007) or Lave’s binary theory of inequalities between learning as schooling different from apprenticeship. On the same path, Lunenfeld notes a divided scenario concerning digital media:

[...] there is a reflection of the dialectical struggle between two camps: naïve realists and networked idealists. [...] The naïve realists are those who would ground the essence of humanity outside the realm of the technological, refusing to concede that technologies manifest human creativity. The networked idealists are those who would brush aside any concern with the debilitating qualities of new technologies and media [...] (Lunenfeld 1999, 4).

Despite computing machines and universities being two bureaucratic structures that play fundamental roles in the construction of *spaces of learning* towards knowledge, there are conflicting issues between both of them according to sources presented throughout this manuscript. Aware of them, we confront this problem in terms of conceptual clarifications (see p.97). For the sake of harmonization, this enterprise is considered elementary to a better comprehension of the *space of learning* promoted at universities in times of digital media.

Educators, prime designers of each *space of learning*, can be neither naïve realists nor networked idealists. They must be aware of computers with their algorithmic potential. Beyond the surface of such

media they can adopt *metaphor machines*, tools capable of assisting humans in their processes of construction of knowledge without any doubt. Under such connotation, digital media becomes a threshold for individuals in need of currency to deal with meanings, namely, information. By entering the interacting world of post-media, signs and descriptions of the outer space are abstracted and indexed close to immediacy (see p.47) and then implanted in the metaphor machine to become available for learners. The speed and expanse of this body of information operates under unreachable conditions in comparison with human beings.

Nevertheless, this amorphous body of information isn't relevant in its infinite potentiality for us to construct knowledge, since the *space of learning* within communities of practices is highly contextual and specific to enterprises, to their social configurations and their negotiated meanings. This is precisely the scenario of the human, where teachers as 'Meisters' are needed. Beyond the surface of classrooms, they are experienced members with *phronesis* (see p.103) and become irreplaceable in their imaginative and creative possibilities, holders of lively descriptions of the outer world. The importance of metaphors is also noted by Dahlbom and Mathiassen:

Metaphors make us creative. They are a way of drawing on our experiences from different areas of reality, making fruitful combinations of ideas that we have a tendency otherwise to keep separate (Dahlbom and Mathiassen 1993, 115).

To address this clarification of concepts, I make the use of metaphors in terms of Lakoff & Johnson and Sfard. Following their spirit, this thesis began with a story. In "learning by wandering, a metaphor of changing perspectives", one can read about an apprentice for whom at some point in life, home becomes too narrow to continue doing what he is naturally amused to do: his *craft*, his *practice*. Home is a *place* that is well known for him, where his *space of learning* is limited, in need of *expanse*. He feels 'Fernweh' [distant-sick] of places he hasn't been before, where according to what he has been told, exciting new *experiences* related to his *craft* occur. Yet, at home he can only look through *windows*, *imagining* it.

Incapable of finding the way by himself, he becomes part of a *community* of people interested in the same *enterprise* he is. Almost as a family, this *guild* supports *newcomers* with *legitimacy*. After being initiated as one of their own, they facilitate him with *tools* to go on this journey of *uncertainty*. The apprentice obtains from them a *map* that indicates a network of relevant points that are available for him to explore. He obtains as well a *gift*, currency that is needed to trade and finally; he carries a bag of a handful of *tools to work with*, some clothes, and a *travel book*, where he will record *sequences* of importance during his *wandering*. Moved by the *natural* affinity he has for a craft and in need of

more *space* to learn, he goes *beyond* the limits of his *home* and enters the *outer world*, supported by the structure of the guild to which he belongs, which transforms now into an *educational network*. He now dwells in his growing *craft*.

In the romantic 'Geselle' figure, we find a learner who prefers to confront that which is uncertain, beyond the unseen. However, he is equally interested in the *precision* of the engineer, who methodically learns *procedures* to approach the *outer world*, mindful of the materials and the effect produced by their actions on this environment of natural phenomena. In the 'Geselle' we find the hard, soft and *dialectical* thinker at once, the *Homo Sapiens*, *Homo Faber*, *Homo Ludens* and *Homo Viator* as well. His space of learning expands and shrinks accordingly, as it is located in *change*, in *dwelling*, in *engaging* and *becoming*.

With all these issues in mind, in this section I complete my reflection by making the notion of *space* (Engeström 2014, 99; McGregor 2003, 357; Lave and Wenger 1991, 14; Sharples, Taylor, and Vavoula 2007, 222) the key element in the construction of *spaces of learning* at universities in times of digital media. In this sense, it has been recommended to steer clear of any *temporal* or content-related approaches (G. Biesta and Säfström 2011, 541; Thomas and Brown 2010, 321; Lave 2012a, 165). To organize these closing thoughts, I specially refer to the claims presented by Bollnow (see p.130) in association with his reflections on *experienced space* (see p.131) in its close association to *Bildung* (see p.171), as it stresses the importance of human beings as active protagonists in their learning, wandering the path between home and the outer world, constructing knowledge as a whole.

In Bollnow's terms, humans move between *home* and the *outer world*. At home, they enjoy the intimacy and safety of a place that protects their *experiential space* (see p.140). However, in the *outside world*, humans can expand or shrink as desired, they wander and explore the vastness and as they do, they change perspectives. Outside, they experience what initially were mere shadows dancing on the surface of a window.

The *space of learning* of subjects is actively constructed, in transition between dwelling at home and going beyond it, in the *outer world*. This emphasizes humans as integral entities that create *space* with their bodies. It grows and shrinks depending on each of our changing silhouettes. If locked inside narrow cages, the *experiential space* isn't able to expand. In the outer space, humans have freedom of movement and with it, our space comes accordingly. The concept must be understood close to the idea of *Bildung*, where one must dwell assuming a dialectical relation that lies between *outside* and *inside*, *global* and *local*, *particular* and *private*, *foreign* and *home*, being *distsantsick* and *homesick*.

It is important to remember that in the *outer world*, Bollnow provides us with a detailed scenario of the kind of *experience* humans have in their *spaces*. Notwithstanding, there are three concepts that are

the cornerstone of my final ideas. First, men are in relation with expanse [Weite], for it allows one to actively advance in the *outer space*, becoming and getting liberated from restriction (Bollnow 2010, 87). However, as soon as one expands *experiential space*, the foreign [Fremd] is there latent, threatening our vulnerability, as men remain away from the security of home.

In the case of a 'Geselle' nevertheless, this is not as menacing as in Bollnow's portrayal, because *foreign*, although contradictory to him, brings an intrinsic opportunity to learn. I agree with Wenger who avoids assuming that there is "an inherent conflict between the individual and the collective" (Wenger 2000, 146). Thirdly, the distance [Ferne] is a place out of reach, where humans can become *distsantsick* –different from *homesick*– longing for that which isn't there (see Preface). This concept stands for the natural curiosity within persons, customary to those willing to go beyond the door of the house into *outside society*. In Bollnow's words, "longing for the distance is, in fact, a yearning for our lost origins, when life was still genuine" (Bollnow 2011, 92).

A last instance of analysis concentrates on universities as places driven by *Bildung*, structures meant to assist learners in between *distsantsickness* and *homesickness*, fostering them to wander beyond into the *outside world*, where they can *expand* their *spaces* and find multiple shelters within other communities of practice, when in the presence of the *foreign*. Universities are presented in my thesis as the kind of structures asked to adapt their educational designs attentive to the silhouette of each person's *space*, intending to afford protection and enhance *spaces of learning* that emerge dialectically between the *inside* and the *outside*. In times of *digital media*, I suggest paying attention to *space* as the fundamental element to envisage *learning* and *teaching* at universities.

Since educators are key figures and designers of those places meant to enhance *spaces of learning* at higher education, I take up the *didactic strategies* structures and confront the formal idea of *learning by schooling* (Lave), reflected also in traditional structures for university teaching such as in Biggs' *constructive alignment*, and Cruz's *didactic strategy* (see p.153); and what I do is offer them an alternative way of grounding concepts based on my previous argumentation.

In the essence of *experiential space* and the *learning by wandering* metaphor, in the next table I offer a number of possible connections about what the intentional act of teaching means, the role played by all participants in a *post-mediatic* constellation of communities, and the importance of space seen as one learns by wandering, and living, and doing or "workshopping", in the sense Arnheim commented on.

LEARNING BY SCHOOLING	LEARNING BY WANDERING (...living, doing, "workshopping", etc)
<b>Teaching intention/ course aim &amp; intended learning:</b> control, punishment, outcome, standards, competences, approving/failing/repeating.	<b>Telos:</b> trust, conversation, contradictions, attentive to changes, teaching as a gift of what is radically new, unfinish, space
<b>Didactic strategy:</b> fixed, centralized, homeliness/Fremd, time, classroom-as-container, nested doll principle, outside mandate, high semioticity, closed questions, school as work, imitation/simulation/models ( <i>fragmented representations of the world</i> ).	<b>Space of learning:</b> flexibility, ubiquity, contradiction, fernweh/heimweh, expanse/shrink, creative act, communities/constellations of practice, low semioticity, school as leisure, metaphors ( <i>holistic representations of the world</i> ).
<b>Learner's role:</b> object, pupil, (cognitive) development, user metaphor, unenlightened, many-one, to be shaped.	<b>'Geselle':</b> family, time, legitimate access and altering memberships, experience/trajectory (skill), Homo Sapiens/Faber/Ludens/Viator, one-one, limited in its space of learning, expanse, Fernweh/Heimweh.
<b>Educator's role :</b> non-essential, professor, designer, innovator, orchestrator, user, changes student's perspectives.	<b>'Meister':</b> essential, political agent of change, performer, learner, information curator for the gift of teaching, designer, experience/trajectory of ample repertoire (phronesis), Homo Sapiens/Faber/Ludens/Viator, broadens student's space of learning, expanse, Fernweh/Heimweh.
<b>Techniques &amp; Teaching and Learning activities :</b> didactic strategy, syllabus, standards, prior experience, evaluation of expected outcomes, hot-transparent medium, timetable, activities, high semioticity.	<b>Tools :</b> customized map, riddles, negotiation of meanings ( <i>participation&amp;reification</i> ), access to more spaces, boundary object & brokering, unexpected/failure (von Glasersfeld), cold/hot medium, confabulation and spacious time, activities [dialectic system], open questions unfinish
<b>Theoretical foundation :</b> immobile bodies in limited minds, decontextualized general knowledge, multi/inter/trans-disciplinary.	<b>Knowledge perspective :</b> mobile bodies in imaginative minds, <i>Bildung</i> , freedom.
<b>Context:</b> network, careers and job market.	<b>Outer world:</b> post-media, constellation of communities of practices, network approach.

Table 04. Learning by schooling, learning by wandering: two approaches to conceive an educational strategy.

To reflect on the tensions that seem to occur between two bureaucrats, digital media and university teaching, I center attention once again on the *classroom as a house metaphor* (see p.137) as it is useful to my upcoming discussion. The relation that exists between the *inside* of a house and the *outside* world is similar to the one between the *space of learning* constructed by educators and its connection with the *outer space*, which is the world of natural phenomena, naturally social and intricate to perceive.



University teaching like a house, and while being inside, shelters us and offers us with homeliness feelings and sacred places where we find spots of “ultimate security”, like beds where people lie down and dream. When “we operate in the opposite direction of perception: we begin with concepts of objects and visualize no more of their perceptual features than are required by the story of the dream” (von Glasersfeld 1996, 98). This is in direct connection with the idea of *human imagination* and what some might call *creativity*.

However, inside the house one longs for the outside, as windows limit us to frameworks of natural phenomena. A person leaves the house through the door and enters the outer space, beyond the limits of what is secure into raw experience. This is the moment when all those descriptions stay behind, analogue or digital instances of the unknown, fabricated for efficient learners inside structures. A door is the threshold between both realms.

A wanderer would leave a house in a romantic gesture, without a goal. A ‘Geselle’ is different, after reflecting and deciding, he climbs over his homeland’s boundary to wander with a clear intention but not aiming for destiny. He is immersed in reflection, but also active in recurrent activities, like Dewey’s students were. The ‘Geselle’ is there to learn and to see the world while dwelling in movement, while becoming in his craft. They are mobile bodies with mobile minds, and in expansion or narrowness, they are supported by guilds.

In ‘Wanderjahre’ these communities of practice are multiple places, like houses with multiple educators, with doors wide open for him, where others reunite, share and belong to a common practice, yet are able to develop new perspectives. Inside a house the place constrained his *space of learning*, now in expansion, he is free but not unsupported. His floating house is his craft, and his craft is now unfolded into different points as guilds exist.

Universities have likewise plenty of guilds, of communities of practice. The *space of learning* for a ‘Geselle’ is as big as his body and his craft expands. It is never fixed. He uses a map to fit his conditions and make decisions and a handful of tools to work with. Ultimately, there will also be a point when he may come back home. His decision may be driven by being homesick. From outside to inside he goes through the door and enters his house. And just like *brokers* do, he will touch others with his lively descriptions of the outer space, that are unique and result exclusively from his own experience.

In the fashion of this metaphor, one may say that part of the tension between university teaching and digital *media* as they both unite to construct *spaces of learning*, isn’t solely because of specific contents or objects of interest. The tension emerges in the light of the *inside* and the *outside*. *Immobile bodies with limited minds*, students inside classrooms perceive descriptions of the world. Like windows of a house, they deal with the algorithmic sign of digital media, or the rhetorical approach of a teacher.

Both of them, human and computer, compete or collaborate on bringing lively metaphors for unknown repertoires of students (see p.246).

Once the formality of the classroom, the term, or their study program is shed by the mechanical clock (see p.67), students enter the outer world. There, they take paths, highways or long trails in absence of any guild, often missing support since their will –or fate– is to engage in practices. All they have now are fragments, rich or poor descriptions that may match organic structures that blossom as wholes, never fragmented.

*Classrooms and universities* are like houses, where university teaching is about designing strategies to support learning in the outside of the structure, where communities of practice like guilds exist. It is no longer about the role of teachers and students, but where ‘*Gesellen*’ and ‘*Meister*’ meet around their craft, reflecting and confabulating.

*Digital media* are *tools* to create decisive metaphors, like windows and doors of the house. They are a threshold between the *inside* and the *outside*. They have the potential to be customized within guilds to behave like maps to be oriented, like craftsmanship tools or like recording devices to collect experiences, as a ‘*Geselle*’ does with a ‘*Wanderbuch*’.

*Spaces of learning* are the *telos* of every educational structure. They are constantly built in dialectical movement between the *inside* and the *outside*, between ‘*Fernweh*’ and ‘*Heimweh*’. They are *continuous*, *emergent* and *unfinished*, always composed as part of constellations of practices and guilds, within a *post-media condition*.

### 4.3.1. University as a house

Learning is a natural event. For it, a question keeps emerging: is it towards natural learning that university teaching is aiming? Moreover, in which way is the higher education structure matching the holistic texture of phenomena? Henri Lefebvre (1992, 71), a French philosopher who was deeply interested in the idea of space, defined the natural *as a spontaneous* phenomenon. Out of a dialectic materialist approach, his critique was very much against the modern idea of everyday life:

But today nature is drawing away from us, to say the very least. It is becoming impossible to escape the notion that nature is being murdered by ‘anti-nature’ – by abstraction, by signs and images, discourse, as also by labour and its products. Along with God, nature is dying –‘Humanity’ is killing both of them– and perhaps committing suicide into the bargain (Lefebvre 1992, 71).

Following its mechanical configuration towards efficiency and repeatability (see p.50), I have stated some perspectives concerning the remediation process that boosts the development of machines acting according to an agenda that favours what Laurillard defines as a *many-one* approach (see p.45). This issue was well described by McLuhan, for he saw in 1964 that “acceleration tends to be total, and thus ends space as the main factor in social arrangements” (McLuhan 1994, 94). For him, the struggle of space was against a specific kind of time, one created and accelerated by media.

Universities are social arrangements. As we have studied with Barnett (see p.163), they can be bureaucratic, corporate or even liquid among the various types he describes. Under such conditions, higher education obeys the same accelerated logic described by McLuhan but also widely commented on by Barnett. Specially in its liquid connotation, universities acquire properties that should be understood in the sense of the post-media condition (see p.105) or Latour’s networked *approach* (see p.172); they behave as a simultaneous *universal medium* with multiple points of physical and virtual conversations, mixed knowledge spreading out in space and time, and boundaries affected because of specialization and “epistemic freneticism”; times when data burst and push libraries to the side (Barnett 2010, 112). Similarly, Biesta offers his analysis in terms of Latour in the following way:

This, then, provides a different way to understanding the relationship between the local and the universal, between the particular and the general. With Latour we can see the world as a plurality of local practices (G. Biesta 2003, 70).

Bureaucratic devices are necessary for a society where control, functionality, aesthetics and symbolism (see p.44) play a role, something strongly associated to the certainty of great scientific success throughout history. However, within the bureaucratic university, humans are recognized in their uniqueness, where each individual is called on to become free and autonomous (see p.169).

Aware of such internal contrast, and assuming that there is a tendency to favour the *time approach* to match a society that strives for standards, it is relevant to explore *experiential space* as a pertinent perspective for reinforcing the idea of unity of knowledge that the original idea of *Bildung* once had (see p.173).

This position is shared by authors such as Punie (2007, 194), who acknowledge that “future learning should enable reflexivity. It should give people the ability to slow down the speed of life, to stop for a while, and to develop the necessary cognitive and affective capabilities to think and reflect upon their own lives and living in a modern world.” I consider his remark, *slowing down* directly connected to the idea of humans with the possibility to transcend according to their diverse contexts, not accelerated by the rhythm of mechanical clocks, but perceived within the context, the outside. Such

initiatives are important to notice as interventions, a framework that itself is in need of time:

Changing what people believe is always a slow process since it means changing people. And engaging people in serious discussions about what they believe is actually a vital element in such a change process (Dahlbom and Mathiassen 1993, 124).

But how considerate are universities of slow education? If we think of the effort some institutions invest in the design of *blended learning structures*, “a process that is pedagogically based and a product (course) with a mixture of face-to-face and online components” (Alammary, Sheard, and Carbone 2014, 443), one of the interests is the “shift of control and responsibility of the learning process to the learners, giving them the opportunity to learn anytime, anywhere” (Tselios, Daskalakis, and Papadopoulou 2015, 224).

Slightly modified, their attempt can be interpreted as an educational structure to enhance learning at any time, everywhere. Their claim may be challenged as soon as one confronts it with the analytic principle of computers, where such information systems create conditions that make it complicated for people unaware of the speed of processes.

Either because of technical conditions that demand updated components or because of the amount of information as it bursts from multiple sources, the speed element is intrinsically required to be part of certain communities of practice. Given this condition, whenever we use information systems, are we really contributing to the improvement of natural learning? Standardized processes of learning, specially those which are undertaken in mechanistic conditions, are really good to count, like we do when applying exams to students, in order to compare information against a grid of indexed contents. This is well explained by Barnett:

If there is a single word that captures the spirit of the age in higher education, it is “technique”. Technique, as I have indicated, is to be found at the levels of institutional evaluation and curriculum design. Controlling quality or improving quality, at either level, comes to be seen as a matter of technique. On the one hand, we see the imposition of technique as a means of assessing institutional performance through performance indicators. On the other hand, the greater effectiveness of the curriculum is felt to lie in the promotion of specified competencies and outcomes. Here the curriculum becomes a matter of technology, in which the required outcomes are engineered (Barnett 1992, 212).

The increasing speed within processes is also noted by Barnett in issues such as the length of books, which are now shortened to fit academic time, the appearance of internet journals to ease publication process into a faster rhythm (Barnett 2010, 113). This leads definitely to a considerable reduction of *spacious time* and with it, the displacement of the idea of space into abstracted and quantifiable digital space, where teachers tend to become “instructional designers’ of pre-prepared modules that have long-distance feedback loops. The university thus becomes pedagogically attenuated” (Cowen 1996).

If we think of *universities as a house*, in terms of Bollnow’s approach to the *experiential*, our approach changes in favour of *spacious time*, being made and experienced with our bodily presence. A house is the structure that contains each person’s space, a place where people dwell and move around in safety, feeling private. According to Bollnow, it is useful to look into the meaning of the word “dwelling” by approaching once again its linguistic equivalent in the German word ‘*wohnen*’, which for him has the “basic meaning of ‘be at ease or content’ with the definition in spatial terms as ‘stay, linger, be in [a place]’” (Bollnow 2011, 122). A university as a house is a special place we get attached to, it’s not like any other place containing spaces of interaction, at home one finds ease and contentment, closer to the Greek idea of ‘*scholé*’ for *leisure* (see p.108), where men are safe, away from the worries of the foreign, not in need of economic development nor imminent production. There one finds a center on earth.

Different from the *outside*, in the *inside* of the house one is not vulnerable and doesn’t have to be constantly active because of a menacing feeling, one is at home and therefore, it is possible to retire from any struggle outside. But it is good to realize that to have this privacy, means that one dwells inside a narrow place inside a *homeland*, which Bollnow explains as an “extended house” (Bollnow 2011, 126). To leave on his journey the ‘*Geselle*’, for instance, must open the door of his house and enter *homeland*, which is still a place separated from the *outside world* and for that reason it is necessary to climb over its limits.

Bollnow (2011, 128) also notes that focusing attention on the experiential space, the “intimacy value” of a house increases with elements such as winter, as it intensifies the attachment men have to their dwelling places. This same clarity of intimacy with the contrast of the inside and the outside is highlighted when the necessity to be out in the world is stressed, because there man finds social activity and tension, always having “the possibility of returning to the shelter of his house” and in the balance of these two positions, one is to find the “inner health of man” (Bollnow2011, 132), not in the measurable idea of decent standards of living (see p.96).

A university as a house is therefore prepared to defend and to raise awareness of privacy as a

human right. This discussion in times of digital media is notable. Eleven years after being published, Naismith et al. (2004, 33) presented a futurelab report containing issues relevant to educators and educational developers. Analyzing their recommendations, it is clear that several affairs listed there remain topics of current debate at institutions.

They start with the concept of context. Reflecting on hot topics of recent years – *think of Big Data or the Internet of Things*–, it is pretty clear that the boundaries between *privacy* and *public information* become vulnerable in the light of new technological developments.

As reported in Naismith et al., the ethical, political and human-rights consequences under threat here cannot be ignored. This claim can be illustrated with the historical interview made by Edward Snowden in The Guardian on June 6, 2013 (Greenwald, MacAskill, and Poitras 2013), where he unveiled controversial information about the National Security Agency (NSA) of the United States of America, showing their surveillance power and capability of access and storage of any kind of data or information transmitted through electronic means on the planet.

This danger however, was something foreseen by Friedrich Kittler (2014), as he described a rather abstract scenario back in 1986, affirming that “one day, those 99.9% of the data flow that still run past the NSA might become graspable and evaluable. Derrida’s ‘post in general’ would become a closed system, writing and reading, calculating and enciphering itself. The NSA as the collapse of strategy and technology would be information itself – “No Such Agency”, with the chance of forgetting us in the process”.

Certainly these menacing revelations are enough for *universities as houses* to take a stance, interested in raising awareness of such issues. Their effort is to provide transparent information, thus getting people to reflect on their technological extensions and after a contextual analysis, confront them as designers/programmers with their own answers, having machines to assist them through given personal solutions.

A man in his house is secure. However, this security is relative and, to be complete in the idea of freedom, it must be clear that his “inner freedom” comes within space, always adaptable to the context or conditions that life may bring. This is presented by the author as a threatening state, because as soon as “man fails to recognize this [...] he does indeed become a contemptible petit bourgeois, and at some time or other, at the latest on his death, this illusion must collapse” (Bollnow 2011, 132).

Dwelling becomes not an element to be understand through rationalism in the sense of the mechanistic heritage, but a reflective act of our freedom, which is a traditional figure of postmodernism in the sense of Lunenfeld’s unfinished (see p.126), the same with Bollnow when he refers to dwelling bound to “certain irresolvable remains of archaic life” (Bollnow 2011, 134). All the same, it is well to

mention that a house acquires the most important status in terms of human places to dwell, because ultimately, it is where we find the whole. Bollnow describes it thus:

For the small child the house is still the whole world, and it is only because the child is rooted in the house that he can grow into the world. It is only because man lives in the house that he can then also be at home in the world, and dwell in the world (Bollnow 2011, 140).

A *university as a house* isn't ruled by the same academic time we have at universities, as Barnett describes it. It flows closer to *spacious time*, where *experiential space* is the center of attention and is in need of organization. It is no longer about a plethora of clashing times, "interrupted, fragmented, running at differing paces" (Barnett 2010, 75). While we have to walk at a bodily pace through campus, someone else browses the internet with speeding actions boosted by the capacity of this tool.

This should be different for a community of practice, certainly for the guild of a 'Geselle', where it concerns the time needed for craftsmanship, the importance of human performance in creating mindful works, sure that as soon as it is finished, there is a place to rest in peace without the hustle of the *outside world*. This is an important challenge for the bureaucratic university, because as remarked by Dahlbom and Mathiassen (1993, 87) the mechanistic approach is about stressing the idea of the individual according to standards and instructions, not about the uncertainty of "direct interaction between divided tasks". Contrary to this, a community of practice is deeply in need of people developing their identities within the "mixture of being in and being out" (Wenger 2000, 165), facing boundaries and a landscape of activities.

If a university is to trust the idea of education in terms of a global, *many-one approach*, then the interest lies in accumulation and productivity. Under such premises educational processes driven by a professor aren't as effective as those belonging to the *metaphor machine*, driven by algorithmic signs and capable of showing infinite instances of the *outer world* instead of just one.

The *experiential space* isn't about "multitasking", since our bodily time isn't the same as the *social clock* or the *mechanical clock* (see p.67). In the presence of multiple tasks in times of digital media, students with *immobile bodies* and *limited minds* prefer the rhythm of devices with infinite images referring to the outer space instead of the slow pace involved in paying attention to a single rhetorical instrument a teacher may offer. McCoy illustrates by using revealing numbers:

[...] for non-classroom purposes a large majority of college student respondents use digital devices during class. These activities included texting (85.9%), emailing (67.8%), and social networking (66%). Respondents said three leading advantages for

engaging in the non-class related behavior was to stay connected (69.8%), to fight boredom (55%), and for entertainment (49.1%). Respondents said such behavior during class caused them to not pay attention (89.8%) and miss instruction (80.4%). When asked what kinds of classroom distractions are caused when digital devices are used for non-class activities, the most common reply (67.6%) was visual distractions, followed by audio distractions (37.1%). Only 16.7% of the respondents indicated the use of digital devices for non-class activities was “not a distraction” (McCoy 2013, 9).

McCoy’s (2013) findings aren’t isolated. Others keep discovering similar conditions throughout their classrooms as *narrow houses*: Clayson and Haley (2013) for instance, discuss the impact of digital use in class in detriment of students’ grades; David et al. (2014) studies the distraction range while studying or doing homework because of smartphone use; overwhelmed, Hassoun (2014, 14) states that “so long as personal media remain integral to our everyday lives, it will be impossible to eliminate the potential for students’ using them in distracting ways”; Ophir, Nass, and Wagner (2009) tell of their measures that showed that “heavy media multitaskers performed worse on a test of task-switching ability, likely due to reduced ability to filter out interference from the irrelevant task set”, and Misra et al. (2014, 19), went even further by declaring the negative impact of digital media against social interaction, where the “global” emerges “at the cost of face-to-face interpersonal relationships.”

However, there we find other experiences that unveil promising uses when bodily actions such as walking are incorporated, in this sense Bidwell expresses (2012) the necessity of conceiving technological initiatives susceptible to given contexts. In her “Audio Pacemaker project”, she raised awareness that whenever humans get hold of technology, “revealed incompatibilities [are revealed] between the point-based representations that dominate technology, and local knowledge and communication practices. Along the way I claim that neglecting these mismatches reinforces infrastructures that already marginalize many inhabitants of the world” (Bidwell 2012, 68).

The challenge in her notes was extended to the realm of representation and meaning, claiming that current media interfaces lag “far behind” the auditory approach in comparison to the visual. In the hope of new developments, her final thoughts are to be emphasized: “we might just try to better incorporate our walking-along bodies into design by leaving behind the devices that constrain our world to points” (Bidwell 2012, 71).

When learners inside *classrooms as houses* are constrained to reflect upon the experience of the world only through descriptions, *computing machines as windows* tend to be infinitely more powerful



than the most diligent of all teachers. Under such premises, both machine and man aim to influence the natural flow of *learning* within students, trying to fly like bees to convince a garden of knowledge to blossom (see p.124).

Automata won't be as clumsy as the analog human, as their bureaucratic construction allows them to construct *endless pieces* of different kinds of information. Not as effective as the metaphor machine, the procedural capacities of a teacher will allow him to fabricate *some pieces* of information that he lectures on with one tone of voice. It is different with a 'Meister', as he will be a performer, his limited metaphor will be lively, and he might have better chances of recognizing and matching the unique condition of a learner, who would be naturally interested in the knowledge this 'Meister' constructs, close to him, embodied within his finite performance.

I suggest therefore, that the understanding relevant concepts for the *space of learning* should considerate a different perspective, from the *bureaucratic time* beyond into the idea of *experiential space*. Implicitly, what I am proposing is to analyze university teaching in times of digital media in terms of altering contexts in everyday life, all of them taking place between *the inside* of our places for learning and *the outside* world. This may rearrange the *content-driven* discussion in terms of doing *with*, doing *without* or doing *for* computers, to instead focus attention on the *place of practices*, where the discussion is about *doing*.

As long as we keep fostering *bureaucratic structures* to keep precise control over the *space of learning* at universities, in times of digital media one only manages to give prominence to the scarcity of teachers and students in their human abilities when reckoning and memorizing information, in contrast to the condition of automata in their accelerated efficiency. The possibilities might improve if, instead of matching standards, *a classroom as a house* made the decision to stress the importance of *space*, where human beings dwell in changing contexts of uncertainty and failure, learning in-between 'Fernweh' and 'Heimweh'. We must be resting and reflecting, acting and confabulating with others. If we do otherwise, personal media will increasingly pervade, menacing in its powerful automata shape, capable of distracting *immobile students* with *limited minds* inside a classroom, a place where doors open into the outside world after buzzing alarms or timetables.

Of course, we all know that it is less than irrational to work efficiently toward a silly goal. "If something isn't worth doing, it isn't worth doing well." But who is to say which goals are worth pursuing? And by what standards are we to evaluate the quality of our results? If I want something, who is to say I should not want it? (Dahlbom and Mathiassen 1993, 236).

When driven by this admiration for efficiency, universities must think of fragmentation as the mean that drives us into rational certainty and prediction. But getting hold of the analytical approach

means one fixates on the surface instead of going beyond it to confront the monster (see p.35), a stance that puts humankind at risk of missing the whole, pressured by specialization agenda promoted by science and industry.

When university teaching is advanced by this idea, *Bildung* within higher education adopts a simplistic form in favour of instrumentalization (see p.171), leading students to grow intellectually apart as “technology-assisted teaching needs to be highly structured while research will deal increasingly with indeterminate knowledge” (Gibbons et al. 1994, 79). This setting must be carefully analyzed, as it emerges in conflict with initiatives that inquire about phenomena in recurrent contradiction. Hence the university is aligned with dialectical thinkers (see p.100), those learners dwelling in-between the inside and outside of a house, reflecting and acting in their struggle for freedom, rising above immediacy. M. C. Taylor (2009) for example, expresses his conviction about restructuring the organization of universities, and calls the separation of departments “obsolete”. Instead, Taylor pronounces himself in favour of the idea of “constantly evolving programs” that periodically must be discussed in order to renew or abolish them. In his words:

It is possible to imagine a broad range of topics around which such zones of inquiry could be organized: Mind, Body, Law, Information, Networks, Language, Space, Time, Media, Money, Life and Water. Consider, for example, a Water program. [...] A Water program would bring together people in the humanities, arts, social and natural sciences with representatives from professional schools like medicine, law, business, engineering, social work, theology and architecture. Through the intersection of multiple perspectives and approaches, new theoretical insights will develop and unexpected practical solutions will emerge (M. C. Taylor 2009).

Similar to Taylor, in the convivialist manifesto (KHK / GCR21 2014) humans are invited to turn their attention to global issues, as most of them seem to concern concrete actions to improve social structures and our experiential spaces. To achieve it, initiatives should avoid fostering primacy of utilitarian thinking, or the sole interest in economic growth by absolute status (KHK / GCR21 2014, 6). When a ‘Geselle’ retreats in reflection and analysis, he realizes the uniqueness of raw material in the outside. Much the same as the gardener’s apprentice, learners at universities as houses observe a dynamic networked context around them and as in the Slow Science movement, “they maintain that scientific inquiry is necessarily a slow, methodological, and thoughtful process, one that is directed not toward quick fixes but at the solution of deeper, more troubling, and yet less visible paradoxes and contradictions” (Lave 2012a, 169). In her case, craftsmanship and becoming skilled craftsmen aren’t a matter of hurry, unruly by the efficiency of production.

### 4.3.2. The altering role of learners

The *space of learning* is constantly made by individuals, it is congruous to the volume of a given corporeal entity (see p.132), which is enfolded by a “surrounding cover” (Bollnow 2011, 31). Agreeing with this Aristotelian analysis of the term, it could be said that the boundary line that connects the experiential space of humans with the outer world is determined by the layer of skin on our body, an organ that coincidentally possess extensible qualities to fit the changing conditions of our figure (Sanders 1973). Together with the rest of our senses, this layer is acknowledged by von Glasersfeld as the *experiential interface* (see p.88). Skin, the human’s first interface, emerges with us when we are born. It plays a fundamental role within life trajectories, as individuals move on with their experiential sequences and construction of knowledge. However, it is known that the more one continues the more one grows into contact with other interfaces to obtain information. Digital media appears as a collection of such interfaces, something we saw with McLuhan (see p.40) as extensions of our bodily senses and raises once again the importance of our *experiential interface*, the initial platform from where other interface forms emerged.

If we think of the traveling *Minervians* (see p.200), these students make use of sophisticated interfaces to engage within an educational structure. Periodically, they must shrink their *experiential space* and retreat into a time-measured algorithmic sign, an informational system of high efficiency that is precisely executed through computing machines that are interconnected. For these learners, indifferent to the location, as soon as they are in the presence of a remote signal, they must stop performing in society and withdraw in front of an automaton. Wearing headphones to hear certain sounds that emerge complementary to the intricate algorithmic sign being broadcast, their *experiential interface* is reduced to certain senses –sight and hearing– while their *space of learning* shrinks significantly. Once the transmission is finished, the *computer interface* is pushed away and here their bodies recover mobility, their *experiential interface* appears back in control and they carry on with their everyday activities.

On the other hand, the ‘Geselle’ is a wanderer who carries few interfaces on him. Instead, he has access to a variety of different tools intimately related to his *experiential interface*. The road for example is one of such tools (see p.159), designed and constructed to ease his journey across the landscape. But let ourselves delve into this issue, because to debate this topic I suggest considering Tim Ingold’s analysis on *walking*.

During ‘Bildung’ and Enlightenment, Ingold recalls that pedestrianism in the Western European scene came back in fashion. Before, this action was considered degrading, a real torture as we see in

the meaning of the word *travel*<sup>106</sup> before times of mechanization (Ingold 2004, 321). Once culture adopted new approaches such as in 'Bildung', western civilization –specially the bourgeois—re-evaluated social events such as to *wander* through a different symbolic value, namely the “independence of the walker were themselves emblems of the process of self-emancipation” (Cusack 2008, 16). Beyond literature and the arts, the traditional 'Geselle' was sanctioned once again by a society that turned eyes on the physical.

This flourishing occurrence may never have happened if it weren't because of human-manufactured tools. Ingold points out this revival as the “mechanization of footwork” (Ingold 2004, 321). In modernity, the walker came into possession of designed shoes to protect his feet, something that had an impact on the natural possibility humankind had when both hands and feet were naked. They made a world of difference between being animals and human beings.

No medium is neutral, and so it was that footwear as a “stepping-machine, deprives wearers of the possibility of thinking with their feet” (Ingold 2004, 323). They numbed movement as it was necessary to fit the structure of feeling secure; and not much later, shoes continued their optimization process and cities “paved the way for the boot-clad pedestrian to exercise his feet as a stepping machine” (ibid., 326), which allowed people to move with ease and precision. Similarly, Ingold mentions that just like with footwear, that same “civilization that gave us the leather boot has also come up with the upholstered chair” (ibid., 323), when none, neither shoes nor chairs, were a human need but merely emerge as commodities that contributed to social configurations of power and distribution.

For the author, both of these technologies bring in the Cartesian trick as they separate mind and body, reflection from action; because someone who is sitting doesn't need to move, but sitting can foster thinking, the same with one who wears protection to advance doesn't need anymore to think with their feet. With boots and chairs we attempt to correct and train our nature. Why? Is it because we don't trust nature in its natural way? In this line of debate, Marcel Mauss distinguished two different kinds of people:

“You can distinguish squatting mankind and sitting mankind. And, in the latter, people with benches and people without benches and daises; people with chairs and people without chairs. Wooden chairs supported by crouching figures are widespread, curiously enough, in all the regions at fifteen degrees latitude North and along the Equator in both continents. There are people who have tables and people who do not (Mauss 1992, 468).

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<sup>106</sup> Travel is a variant of the french word *travail*, which derives from medieval Latin *trepalium* (*tres* 'three' + *palus* 'stake'), which was an instrument of torture.

In the previous scenarios, one is able to recognize the determining influence media brought into play for the human body, but more specifically the notion of *space* when confronting natural phenomena. Humans like engineers, make use of tools in order to change their environment (91), inflicting the mechanistic approach in favour of control. However, I find it even more relevant to notice the effect caused by different interfaces in the way we interpret a world, either closer or displaced. Whether a *naked footed human*, a *high-booted gentleman*, a *wandering learner* in 'Wanderjahre' or a *travelling Minervian*, they all act and confront the *outside* in different *space* conditions, helping themselves while using different artifacts.

In close connection with each of their interfaces, each is a different world being experienced after all. While the Minerva student is prompted by an interface to enter a classroom of invisible walls but *narrow space*, the 'Geselle' isn't worried about what the clock has to say to get immersed in the landscape of possibilities. The rules of nature, knowing the course of the day, or the sun and the movement of the stars, this is enough reminder of time in its presence. The *high-booted gentleman* will be rushing over the pavement, safe from imperfections or interruptions, but the *naked-footed human* will take a slower pace whenever he walks over grasslands, "a restful and calming rhythm takes hold of us here" (Bollnow 2011, 112).

When *students* and *teachers* perceive natural phenomena through their *experiential interfaces*, the space they construct acquires new dimensions and is not a given. Normally ruled by *academic time*, their roles and actions are to be accounted for, as they turn into "resources to other ends" according to Barnett (2010, 75). Different is the case of 'Geselle' and 'Meister', who are one with their *experiential space*, creating it in activity (Bollnow 2011, 34).

Both leave and enter the house, dwelling on *unfinished* conversation with their inner space while longing for the unreachable distance; other times they will simply yearn for the coziness of home. When they leave, family and friends remain behind; beyond the limits of their homeland, they expand their space and become part of a constellation of brothers and sisters, the foreign and their craft. With their activity as well, they become members of a community of practice while being naturally active, acquiring an identity in-between "the obvious and the mysterious, the transparent and the opaque" (Wenger 2000, 153).

'Geselle' and 'Meister' thrive to improve their performative acts (see p.168) not only with their words but also with their actions. Similar to Duchamp's audiences in postmodernism (see p.37), they complete the creative expression or create pieces of work where they invite others to become part of their activity. *Performativity* is a relevant capacity to consider within learning instances at their

communities of practice. In its potential, it may foster a dialectical discussion between the *theatrical* aspect (see p.168) necessary in becoming craftsmen and the *engagement* among individuals within their guilds, as they develop in their practice.

Furthermore, because it is a concept that embraces change of oneself or others, dynamics are to be observed. Intimately associated with their changing participation, members throughout different guilds belong to different communities of practice in different ways, never constrained along “sequences in time”, however closer to the identity they construct with all different trajectories (see p.142). It is through these conditions that they turn into *oldtimers and newcomers, full participants, brokers* and *legitimate peripheral participants* taking part in Lave’s cross-context (see p.169):

[...] some past, some current; some as full members, some in more peripheral ways. Some may be central to our identities while others are more incidental. Whatever their nature, all these various forms of participation contribute in some way to the production of our identities (Wenger 2011, 158).

A ‘Geselle’ and a ‘Meister’ are different from students and teachers. Their relation isn’t based on a hierarchical structure that promotes control, punishment, or outcomes that will end up judging a student as approving, failing or repeating a unit within a programmatic offer. Their relation is driven by conversation, by doing together, being attentive to changes and ever immersed in the recursive activity of their craft. Their relation responds to a world of flux that isn’t about a time-measuring system (see p.67), but instead is driven by their claim upon experience, which is according to Dick Pels part of the postmodern approach:

It has become a cliché for connoisseurs of postmodern sensibility to say that we live in a world of flux, where mobility, experimentation and transgression have turned into core signifiers of the daily management of lifestyles. To seek adventure, to live the experimental life, to probe the limits of one’s identity, has become a singularity powerful motif in popular and elite culture alike, ranging all the way from ‘low’ transgressions and kicks [...] towards more costly and rarefied pursuits such as surfing the Internet, high-tech mountain climbing, mobile phoning, continuous cosmopolitan travel, transgenderism and intellectual ‘nomadism’ (Pels 1999, 63).

Aware of this changing world, members of communities go beyond the limits of their house and learn by wandering. When not reflecting, they participate in conversations (see p.144) something that Wenger (2000) and Laurillard (1993) agree is a core element within communities of practice and

educational configurations. To this extent, participation is considered “an active process” (Wenger 2000, 56) between social beings able to reflect and create knowledge. ‘Gesellen’ and ‘Meister’ are evenly united under such premises, together they narrate their trajectories and in performativity, their utterances are lively descriptions of the world they experience. Different from the infinite algorithmic sign in digital media, their words are unique pieces created in the light of knowledge. They do not construct illustrations out of precise data operations nor are they aiming to reproduce de-contextualized information. In the rich and mysterious process of reflection ‘Gesellen’ and ‘Meister’ confabulate (see p.144), conscious that memory plays a big role. Bollnow considers this concept as he describes the moment when lying in bed, one wakes up:

Rather, at first he finds himself in a condition of total non-spatiality. It takes several steps for space to build up, and it is only the result of these intermediate steps that he at last finds he himself again in his usual space. [...] It is only memory that gradually lifts man out of this uncertainty. (Bollnow 2011, 167)

For a student framed within a *learning-by-schooling* approach, memory is a fundamental feature. To perform under bureaucratic structures, one must accept the ruling ideal that encourages efficiency. A student in a *classroom as a house* would answer in terms of right or wrong, always assessed by specific protocols to meet standards. For different evaluation processes and educational activities, they must showcase different mental processes where their proficiency is strongly linked to remembering and to dealing with large bodies of information. But wasn't this precisely Vannevar Bush's *Memex* vision? Automata has certainly lived up to the promise of *memory* and storage. With its accelerating character, digital media grows into newer shapes, always geared to accomplish more data storage beyond human capacity alone. Take as an instance Ars Electronica Festival, where memory became in 2013 their *boundary object* of study.<sup>107</sup>

Nevertheless, all this potential is seen as a warning by others. In “Digital Amnesia”, Van der Haak (2014) pays attention to an alternative viewpoint, where hardware and devices are conceived as vulnerable objects. In the presence of remediation processes, necessary technologies that once were

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<sup>107</sup> Total Recall: The Evolution of Memory is the title of the Festival for Art, Technology and Society (ARS Electronica) in 2013. A leading organization in the topic, maybe the most important in its field, explains the topic as it follows: “The latest methods in biotechnology have already successfully been used to store digital information in DNA. This will make it possible to store 100 million hours of high-definition videos in a single cup of DNA. But what are we going to do with all this data, and what differentiates saved data from remembrance, from memory? [...] “Recording,” our term for registering information, comes from two syllables, “re” and “cor,” and thus reminds us that people used to believe that we preserved memories in our heart. (Ars Electronica 2013)

important to preserve information, now are displaced after short periods of making digital media vulnerable. Their argument is that despite the possibility of the existence of technical means to record our past, important challenges are yet to be tackled.

As they *learn by wandering*, 'Gesellen' and 'Meister' are certainly in need of their memory, for it the 'Geselle' has a *record machine*. However, this is not a currency for them to become members in their communities of practice. Different from the approach prompted within students, teachers, and compressed data interpreted with digital media, they prefer to *negotiate* meanings by confabulating. Learning is in need of failure to accommodate new concepts, and *imagination* and *creativity* seem to be associated with this "inaccuracy" of retrieving past information (see p.144).

When they reify and participate, they will make mistakes and missing frames may be filled with all other kind of sensori-motor material (see p.88) they may come up with, in the middle of their knowledge constructions. *A university as a house with open doors* embraces apparent incongruity as a fundamental principle to promote movement. Efforts of these kinds take place in the informal educational realm, often within art and technology.

There are for instance, educational initiatives that address computation in terms of poetics.<sup>108</sup> *Poetic Computation* for instance, is a place where students go beyond the surface of a computer to aim for the strange, for a kind of learning related to surprise and delight; (SFPC 2015) otherwise impractical and magical (O'Leary 2013). Still minding different structures, this community of practice meets in what they like to do best, using code, and for this they aren't in need of any formal program or degrees. Similar to the spirit that moves the 'Geselle', they explain that theirs is a "program for self-initiated learners who want to explore new possibilities. "This is a program for thinkers in search of a community to realize greater dreams" (SFPC, 2015). Nevertheless, 90 years before their idea, a school in Germany named Bauhaus became one of the inspirational models that pursued the idea of the general, being in-between guilds, becoming part of the outside lively experience. Nike comments on the Bauhaus School:

An important aspect of Bauhaus education was the cross-over of practical skills in workshops and theoretical insights. Although the original idea of two masters meeting –one from art, the other from a craft– was soon abandoned almost entirely, the reason for this idea was the best you could give: skill and invention, repetitive exercise and creative expression must unite. A great idea seeking a new form of

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**108** School for Poetic Computation is a place that promotes to learn about computation as a creative and expressive art, "computation is poetic when technology is used for critical thinking and aesthetic inquiry – a space where logic meets electricity (hardware), math meets language (software) and analytical thinking meets creative experimentation." (SFPC 2015)



expression needs the security of a hundredfold experience in order to appear (Nake 2008a, 321).

In their *guilds*, members undertake altering activities. Without the necessary presence of timetables, each 'Geselle' has different rhythms and a general plan. They make their own decisions depending on the emerging enterprises and the changing conditions, becoming part of the community and engaged in practices. Their identities are complemented next to their membership, engagement and trajectories, and these sequences lead towards full participation and becoming *oldtimers*. For those members, Lave presents the concept of »mastery«. For her, a master practitioner "unites the identity of master with skilled knowledgeability" (Lave 1991, 76), something limited in our contemporary society according to the author.

Besides the *mastery* of a full participant, members can be *brokers* (see p.146). As discussed, these members aren't necessarily fixed to the core of a practice, but instead, they concentrate more on wandering in-between the boundaries of different guilds. Their balanced state of participation is in danger of becoming either rejected as intruders or being dragged into the core of activities to become full members of a community. In the words of Wenger "brokering therefore requires an ability to manage carefully the coexistence of membership and non-membership, yielding enough distance to bring a different perspective, but also enough legitimacy to be listened to" (Wenger 2000, 110).

It is important to be reminded once again, that beyond the relevance of their membership or participation, member's craft remains always a meeting point that allows outsiders and insiders to come together. In this sense, when a student meets a teacher, he follows a protocol to be educated, respectful of all the rules and aware he is different to a teacher.

In contrast, when a 'Geselle' meets with a 'Meister', they are first of all interested in sharing a craftsmanship, something bigger than the both of them. A *university as a house* that stands in awe of practices is always inviting outsiders and insiders to share between spaces, to dwell in actions while doing together, negotiating meanings and perspectives. Members of guilds are encouraged always to become 'Meisters', as learners in the idea of *Bildung* are meant to turn into academics (see p.171).

Beyond their conditions concerning trajectories or repertoires, most important is to engage in activeness. In practice they are all the same, with differences given by their mastery, not by a bureaucratic organization. Wenger (2000, 114) suggests that this setting encourages them to "gain a history," and while doing together they are able to sustain mutual engagement which is basic to building relationships, to remaining connected and accordingly to becoming part of the enterprise they do, and to include *boundary elements* within their repertoires, something that allows them articulate

forms of membership involved when being together.

Moreover, when the relationship between learners and educators finds its center in activeness, one should not think that the *space of learning* is reduced to the immediate action going on between them. In this sense, Wenger provides us with a clue as he states that “the relations that constitute practice are primarily defined by learning” (Wenger 2000, 130). He then talks of a “landscape of practice” which is referred to the continuous construction of localities related to a practice, something that can be thought of in the sense of an activity that produces another activity, which is an important feature discussed by Engeström (see p.120).

Nevertheless, it seems that the traditional classroom figure continues resembling the *nested doll principle*, an approach traditionally used in engineering and product design where “objects are contained in similar other objects in order to satisfy certain constraints” (Abdel-Fattah, Besold, and Kühnberger 2012, 4). A university as a *narrow house* promotes *spaces of learning* inside a guarded place which is constrained in curriculum, faculty, university, regional, industry and all the satellite structures that at the same time, attempt to control the structure of higher education.

When they are *learning by wandering*, members within a community of practice embrace »radical critique«. According to Nake (2008a, 328) this approach emerges out of close study of phenomena, avoiding conjectures. The hard and soft thinkers are unable to deliver radical critiques. One must assume a dialectical structure to be in this constant study, where humanism is essentially the main interest, between being skeptics and optimists (see p.99). In this sense ‘Geselle’ and ‘Meister’ foster the idea of a radical critique, because in it they encounter the uncertain effect of the organic, impelling structures towards a new change.

*Multitaskers*, afflicted in their classes because of monotony, distraction, fighting boredom or in need of entertainment (see p.215) and those teachers, overwhelmed with the heavy burden of teaching and unable to identify themselves as university teachers (see p.167) may well profit from the radical critique approach. Nake unveils some of the characteristics that become relevant to the *university as a house*:

The radical critic is a person who loves being surprised and being amazed. They marvel at phenomena because otherwise they cannot study them. They allow themselves to be astonished. Before jumping on a quick answer or reply, they sigh in awe because they did not expect what they observe, and they do not pretend that they had expected this anyhow” (Nake 2008a, 328).

When *a university as a house* embraces a *learning-by-wandering* approach, its structure is able to recognize the “new way of learning” observed by Thomas and Brown (2010), where the frame of knowing, making and playing raises important reflections on the role of learners (see p.125). In this sense, positioning the *space of learning* as the center of attention, allows us to question the fixed structure between students and teachers, *immobile bodies with mobile minds*, into a broader scenario. Instead, the ‘Geselle’ and ‘Meister’ are: *Homo Sapiens* finding their optimal development as cognitive entities; *Homo Faber* as they remain naturally engaged in their reflecting, feeling and doing; *Homo Ludens* because in leisure they solve riddles and experiment playing with surprising outcomes, and finally *Homo Viator* as they keep becoming human by wandering, while moving, embracing distance while expanding or shrinking in space.

When learners within *universities as houses* embrace *academic time* as their approach, Barnett (2010, 113) warns us of an “ignorance explosion”, as long as we keep aiming for the unfathomable body of information flowing out of journals, libraries and internet. This condition creates a bigger “gap between our ‘knowledge’ of the world and our possibilities for turning that knowledge into understanding” (ibid.,113) and what was understood as knowledge, is then transformed into “data streams”, which is at the same time processed into information by individuals.

However, turning our attention to the importance of *space* in terms of ‘Gesellen’ and ‘Meisters’ within their guilds, means that a university as a house is open to support and the welcome of altering members of a constellation of communities of practice, learners of a vivid journey that happens between the *inside* and the *outside*.

Guilds provide them with tools to face the uncertain, while becoming and dwelling in their practice. Their trajectories of participation take place balanced between a rhythm of life tied to their *experiential spaces*, aiming constantly for mastery of their craft and confabulating in the social. Their dialectical exercise is well illustrated by Andrew Cusack, who highlights attention in one quote found in Goethe’s *Wilhelm Meisters Wanderjahre*, where Jarno, one of the characters, describes Wilhelm in the following way:

I see you as a wanderer’s staff, which has the remarkable quality of sprouting leaves in whatever corner one sets it, but nowhere striking roots (Goethe 1995, 120).<sup>109</sup>

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109 “Einen Wanderstab, der die wunderliche Eigenschaft hat, in jeder Ecke zu grünen, wo man ihn hinstellt, nirgends aber Wurzel zu fassen.”

### 4.3.3 'Geselle' and 'Meister'

In *learning by wandering*, the concept of 'student' unfolds in many shapes. They are like any other member within a community of practice, where individuals dwell in their craft and become social entities around it. Beyond the surface of hierarchical divisions that are based on control and outcomes, a 'Geselle' is seen as someone driven by curiosity and conviction into craftsmanship, in need of expanding his space of learning into the outside world.

A 'Geselle' isn't a *user*. He is an active learner in *Bildung*, a free man, unique in the way he perceives the world and constructs knowledge when reflecting (see p.171). Whenever people become considered *users of information systems*, according to J. David Bolter and Grusin (2000, 248), they are treated as the target group of a specific interface in need of personalization, namely the adjustment of certain control parameters that are fabricated by someone else to meet *users* in their possibilities. This may be a menace because, as media interfaces and devices become more powerful, humans as *users* increasingly become "mere consumers" (Illich 1975, 24).

In times of digital media, the accelerated process of technological remediation continues turning interfaces and devices into intricate shapes of technology, a setting that intensifies the gap between users constrained to parameters, unable to go beyond surfaces as they tend to disappear in their presence.

A 'Geselle' goes beyond interfaces. His goal is wisdom and truth, committed to a craft and his will drives him between boundaries. At the same time, a 'Meister' doesn't see a 'Geselle' as a user. It is known for him that when designers of computer systems, for instance, talk about "the user", they are using a perspective where people are reduced to "resources". While traditional educational designs aren't interested in recognizing *users* as humans engaging in multiple communities of practice, in learning by wandering this becomes the opportunity to get involved and support learners with *mobile bodies and imaginative minds*. When a 'Meister' brings any interface inside a guild, he is offering "boundary objects, and designing them designing for participation rather than just use" (Wenger 2000, 108).

In his opening chapter, Marshall McLuhan provides a short hint about this issue. "Failure in this respect has for centuries been typical and total for mankind. Subliminal and docile acceptance of media impact has made them prisons without walls for their human users" (McLuhan 1994, 20). Meant in a critical way, he presents the term »user« in relation to a media "prisoner", who mildly accepts that which is being rammed into him. While it isn't clear about the immediate discussion going on at the time nor how extensive this concept was being used in relation to machines, it is known that this

term alternatively refers to people as drug consumers (Oxford Dictionary 2013).

Nevertheless, in the early '60s the concept is adopted by the new field of Computer Sciences.<sup>110</sup> The *user metaphor* I refer to was detached from any negative connotation and indeed, it was a helpful descriptive to categorize those persons in charge of computers. Chapin (1971, 15) writes about six types of "Users" (in order from most prominent to casual): administrative, engineering, natural science, social science, humanities and "all other users" type. A minor, yet revealing sentence is added at the end:

Historically it has been common to refer to administrative users as business users, and to their uses of the computer as business data processing applications. The other five types of users have historically been called scientific users, and their uses of the computer as scientific computation applications. Clearly, this historical use of the terms is inaccurate and misleading– but it still persists as a convenient oversimplification" (Chapin 1971, 16).

Indeed, the term was embraced worldwide to the point that now concepts such as *User Interface Designs*, *User Experience (UX)*, *User-friendly*, *End-User Development*, *Open User Innovation* are common descriptions of human processes being served by computing machines. Even for Alan Kay, a key contributor to the success of *Graphical User Interfaces* (see p.182), when asked to write some ideas on User Interface Design, he reacts surprised about the relevance of the topic:

When I was asked to write this chapter, my first reaction was "A book on user interface design - does that mean it's now a real subject?" Well, as of 1989, it's still yes and no. User interface has certainly been a hot topic for discussion since the advent of the Macintosh. Everyone seems to want user interface but they are not sure whether they should order it by the yard or by the ton" (Kay 2001, 123).

For this it should be already clear, that no 'Geselle' nor 'Meister' is a *user*. This aspect should be as clear as possible, because a system design meant for a *user* differs from one meant for a human being. Erickson (1993, 66) stresses this idea, telling of the misleading effect icons have over most computer users, because "just as we experience arguments as real conflicts [...] when they move a document icon from one folder to another, they are really moving the document itself". In this case, the transparent medium becomes global, and *users* aren't able (or not fostered to) to explore beyond the surface of the

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<sup>110</sup> A novel field, taking into consideration that the first Computer Science course offered in the world, began in 1953 at University of Cambridge's Computer Laboratory. (Ahmed 2013, 96)

interface:

“The ability to “read” a medium means you can access materials and tools created by others. The ability to “write” in a medium means you can *generate* materials and tools for others. You must have both to be literate” (Kay 2001, 125).

A ‘Geselle’ isn’t anything like a *user*. He is a part of a community of practice, a guild of brothers and sisters. As a dialectical thinker in movement, this learner is a *Homo Viator* who is avidly overcoming the gap between *the inside* and *the outside*, the *security of his house* and the *uncertainty of natural phenomena*. In the outer world, he is supported by the guild structure. His identity is built by his growing skills as *Homo Sapiens* and *Homo Faber*. With his inquiries, he initiates changes driven by activities within a system fit to embrace “flesh-and-blood dialogue partners who have their own emotions, moral concerns, wills and agendas” (Engeström and Sannino 2010, 340).

The student in the meantime, obedient to calendars and curriculums, must fit the standards like a user does, and follow the control parameters fabricated for him after a *nested doll principle*, ultimately executed by an agent. This student’s *space of learning* is constrained by academic time, unquestionable and constructed in the name of natural learning. He adapts to this structure of mechanistic approach and bureaucratic thinking, which is the approach that better fits data and information processing. Comparable to the naked-footed human who trains his feet with footwear as a *stepping-machine*, so is natural learning tamed by schooling. This debate is also observed by Banks during the early stages of human development:

Education provides a good example. Preliterate children, and even pre-linguistic infants, are encouraged to engage with picture books, not in order to develop their visual sense but in order to familiarize them with books of words they must learn to value and rely on in later life (Banks 2001, 9).

*A university as a house with open doors* supports learners with *mobile bodies* and *imaginative minds*. Furthermore, it is a fundamental design that supports ‘Gesellen’ throughout their journeys, always invited to become ‘Meisters’ just like students were invited to become scholars in times of *Bildung*. For this, they are in need of the right strategy to explore the world, to be aided by tools during their journey, and to be part of a guild that provides them with a space of learning apt to expand or shrink, according to special features present within each individual.

A ‘Meister’, more like an *oldtimer* with rich trajectories throughout practices, is someone who assists with his active experience other ‘Gesellen’ wavering on their way to confront *the foreign* in the

outside world, naturally willing to engage in enterprises of interest beyond the security of homeland. 'Meister' and 'Geselle' are skillful to different extents, just like humans have repertoires with a certain amount of experience depending on their activeness throughout life, not necessarily because of their age.

The 'Meister' however, is someone who has grown and developed in his craftsmanship beyond the others. His role is essential, as he is the designer of structures to enhance new spaces; his actions have a unique force that lead to transformation within others and even himself (see p.169). He is a radical critic that prefers to ask questions instead of offering answers (Nake 2008a, 328). This entitles him to create powerful metaphors and descriptions of the *outer space*, as radical critique isn't concern about words as isolated instances, but about the concept that as a class, contains multiple related words. "A concept may be expressed in various words and still remain the same concept. At the same time, we know that words powerfully influence our thinking or even shape it" (Nake 2008a, 329).

Different to the common belief that a teacher is "a content expert" who decides the topic to teach depending on specific contents" (Biggs and Tang 2007, 82), we may as well think of the educator as a 'Meister' of rich experience, with trajectories of ample repertoire from their engagement within different practices, a condition that makes him a counselor able to share in practice. This basic condition may contribute to ease the formal structure of *learning by schooling*, one that elevates the teacher figure as the ultimate decision maker, the agent that executes all processes within the educational place (see p.167). To describe this tension, Laurillard (1993) offers an analogy where a classroom is compared to a travel:

Consider what the lecturer, meeting a class for the first time, has to do: the lecturer must guide this collection of individuals through territory the students are unfamiliar with, towards a common meeting point, but without knowing where they are starting from, how much baggage they are carrying, and what kind of vehicle they are using. This is insanity. It is truly a miracle, and a tribute to human ingenuity, that any student ever learns anything worthwhile in such a system (Laurillard 1993, 3).

Instead of carrying this burden, a 'Meister' is an older wanderer who widely knows about certain spaces throughout the landscape. His own *space of learning* is always longing for the distant, as in expanse he has been able to construct himself through methods, observation and reflection around the natural phenomena he has experienced. He is a *Homo Sapiens* able to utter lively and significant descriptions of the outer world for individuals around him, this while acting together, all of them learners like him assuming different conditions. He is the respected and skillful *Homo Faber*, able to

create harmony between his words and his work, methodical as a hard thinker. Nevertheless, the 'Meister' is also a *Homo Ludens*, always full of radical critiques and surprising performances, throwing recurrent riddles and activities that not even he is sure how to solve. He is the *Homo Viator*, able to retrieve from his memory new metaphors experienced by him. He wouldn't aim to reproduce the same words nor educational strategies, for he is an attentive craftsman that values changes around him and the context of others.

In his relation with a 'Geselle', teaching becomes a matter of trust. He offers a gift of his *phronesis*, never an imposition nor a control-driven performance. The 'Meister' couldn't feel threatened by the interpretation process of any tool as in front of each 'Geselle', he will retrieve unique and contextual pieces of memory to confabulate with these learners, minding the "what is" and not the "what is not" in each of their cases, reflecting and doing (see p.177).

An educator in a *university as a house with open doors* is himself a promoter of dwelling in the contradiction between *the inside* and *the outside*; he is a radical constructivist that embraces rational knowledge aware of its tension with poetic imagination. In his practice, a 'Meister' builds a bridge between approaches and knowledge, observing, sensing the condition of others.

Like learners in the *School for Poetic Computation*, a 'Meister' designs educational structures to let contradiction meet poetic and rhetoric actions as Laurillard says (see p.167). For this, the educator may adapt the shape of the performer able to offer new spaces of relevance for a 'Geselle' and his context with altering metaphors, actions and activities. What is presented by the 'Meister' isn't infinite, for he carefully chooses instances of information, those bonded to 'what is' available, avoiding the 'what is not' (see p.160). In this sense, an educator as a 'Meister', is similar to the idea of mathematicians according to Vannevar Bush:

A mathematician is not a man who can readily manipulate figures; often he cannot. He is not even a man who can readily perform the transformations of equations by the use of calculus. He is primarily an individual who is skilled in the use of symbolic logic on a high plane, and especially he is a man of intuitive judgment in the choice of the manipulative processes he employs (Bush 1945, 116).

In terms of Lunenfeld (see p.204), 'Meister' and 'Geselle' aren't naive realists nor networked idealists. In movement, craftsmen make use of tools to assist him, always aiming for the whole, in the middle of contradictions. If they were looking at a photograph for instance, they would be "looking through, looking at, and looking behind" the sign (Banks 2001, 10).

Signs and symbols are therefore a key factor to mind. Remembering the importance von Glasersfeld



gave to languages, a 'Meister' is always eager to study the realm of abstractions, the importance of "liberation from a single mother tongue" (von Glasersfeld 1996, 19). Von Glasersfeld also pointed out that in his case, being exposed to different languages was a key aspect to understanding intricate concepts regarding radical constructivism. This feature is presented by him as an advantage, since he wasn't "constrained by a single language" (ibid., 19). Similarly, for a 'Meister' to be part of such a setting may be seen as the opportunity to expand the *space of learning*, because it enables one to be capable of growing into a richer negotiation of meanings, and new activity sequences. Von Glasersfeld clarifies:

And there is another obstacle: the language in which our thoughts have to be formulated, be it English, Italian, or any other natural language, has been shaped by the naive realism inherent in the business of practical living and by a few prophets who were convinced of having access to an absolute reality (von Glasersfeld 1996, 19).

Following this line, it is acknowledged that to work with computer machines as *tools*, 'Geselle' and 'Meister' are invited to deal with the *metaphor machine's* language. Engaged in this enterprise, they are able to perceive the algorithmic sign in its richness of abstraction, repeatability and rational organization, an activity that takes place necessarily beyond the surface of computers. Users are concerned with interfaces; 'Meister' and 'Geselle' pay extra attention to computational languages.

I use the computer to execute a program. This is an enormous shift from the embodied action of moving the pencil. Different skills are needed, different thinking is required and enforced (Nake 2012, 73).

Among Laurillard's premises, she discusses »simulations«, which are programs that run models explaining certain phenomena of the world "without any input of the user" (Laurillard 1993, 132). Therefore, users are there just to watch. For her, to access the "explicit form" (Laurillard 1993, 136) from where this simulation is created should become part of a teacher's clarification, as soon as one of these algorithmically generated descriptions takes part in a class. Doing this, he will be unveiling what is "hidden in the depths of the program" (ibid., 136) as it will enable them to deal in better ways with this second-level order of experience within a classroom (see p.160).

But having both forms of access –explicitly via equations or rules, and implicitly via behaviour of the model– gives the students a better chance of relating their experience of the world (actions on the model) to descriptions of the world (the formal statement of the model) (Laurillard 1993, 136).

When programming, one aims to construct a formal description after human experience, organizing orders, protocols and symbols based on a sequence perceivable for a machine, the most developed bureaucrat within society. In programming, we are able to encounter the global metaphor, universal and standard to fit different mechanisms. In its rational attempt, a 'Meister' makes use of this powerful tool being able to grasp the algorithmic sign, never as a user:

"When computers become as ubiquitous a medium as the book, why should academic knowledge not be expressed also through the medium of a program?"  
(Laurillard 1993, 142).

Thinking of programming languages as powerful tools for Homo Sapiens, is about creating negotiation bridges throughout various communities of practice that engage in this enterprise. They are boundary objects that bring together human processes by describing them much more precisely. In terms of von Glasersfeld, the capacity of language is an in-between thing. To have this confrontation of languages is important, as they pervade the everyday in different shapes. That is, a continuous and sustained action:

You realize that the differences between the languages are not merely a matter of vocabulary or grammar, but a matter of looking at the world. This inevitably raises the question, which of these ways of looking might be the right one. But then, because you have been living quite happily among people who look at the world differently, you realize that this is a silly question, because all the speakers of one language obviously think that theirs is the "right" way of looking at the world" (von Glasersfeld 1991, 2).

'Geselle' and 'Meister' aren't users, instead they are closer to »algorists«. Whenever they do their craft assisted by computing machines as tools, they behave like those artists described by Nake (2012, 63), reflecting on their processes first, before getting too involved in producing instances, or using any interface. Between aesthetics and algorithmic signs, they are like the yawning farmer who builds a barn in his mind before moving a muscle, different from users like bees, performing hard labour without being aware of the driving force making them act (see p.124).

Algorists as painters do their work "drawing and painting from far away" (Nake 2012, 65), for they carefully specify the rules of construction, aesthetics and tensions of certain elements within a composition, away from the computer. Later on, these sign sequences were transformed into infinite instances of a class, as soon as they were interpreted by machines.

Differently, a painter invests his time and effort directly onto the surface of his canvas, one stroke at a time. Alike is the difference of a 'Meister' and a teacher. The first one is a revolutionary performer that presents a *creative act* always *unfinished*, which together with other 'Gesellen' can be completed. Since the 'Meister' isn't a *content expert* like a teacher is when *schooling*, he doesn't fixate on specific *portraits of the world* nor is he urged to feed any specific description inside others' heads. He prefers to go beyond the surface of a curriculum or syllabus, this in order to identify the concepts that generated those metaphors collected within a class plan. Finding these points will lead him to unfold a network of practices and spaces relevant to their context, and most likely, others interested in that practice as well. Ultimately, going beyond the surface of *learning by schooling* will allow him to expand the *space of learning*, enabling a *classroom as a house with open doors*.

In *learning by wandering* all members of a community of practice are familiar with *critical engineering*,<sup>111</sup> where out of ten statements, their eighth idea reads as follows: "the Critical Engineer looks to the history of art, architecture, activism, philosophy and invention and finds exemplary works of Critical Engineering. Strategies, ideas and agendas from these disciplines will be adopted, re-purposed and deployed". In their practices, it is clear that beyond the surface of the inside, of a discipline, these can be tracked into a scenario as a whole. 'Geselle' and 'Meister' make use of convivial tools, as Ivan Illich explained:

(...) which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision. Industrial tools deny this possibility to those who use them and they allow their designers to determine the meaning and expectations of others. Most tools today cannot be used in a convivial fashion (Illich 1975, 34).

All in all, a *university as a house* is a place that supports learners on a journey driven by natural learning. It may be thought of as Barnett's '*therapeutic university*', inspired by Timothy Bathi's analysis in 1992 where a modern university is considered an injured structure in need of therapy. Furthermore, it is stated that "the therapeutic university is with us already, at least to some extent. The therapeutic university has a care for human beings as such: it has a care towards all of the members of itself, which is to say all of its staff and all of its students, but perhaps especially its students" (Barnett 2010, 120).

In his claim, main concepts are presented to define his therapeutic approach. By concentrating on

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<sup>111</sup> The Critical Engineer Manifesto (Oliver, Savičić, and Vasiliev 2011) raises a concern on technology and its uses, openly meant to engineers and all individuals caring about these issues. In this manifesto the authors depict what they do, contrasted to what they should be doing in terms of their careers, and their productive life and society. It is an open and universal call of critical dimensions.

the notion of *care*, which he defines as hardly a characteristic of a market relationship, he defines uncertainty as one of the necessities denied to those to be cared for, since we are “over-run with certainty, certainty in relation to ideologies, religions, the power of science, and the value of markets.

A sense of uncertainty that derives from an understanding that readings and perspectives could be other than they are is a mark of *maturity*, and not of immaturity” (Barnett 2010, 122), which only means that it is up to universities to recover their interest in promoting *epistemological uncertainty*, which [...] “lies in a recognition that our accounts of the world could legitimately be other than they are” (Barnett 2010, 122). This is one of the main roles to be overtaken by the therapeutic university.

*University as a house of mobile bodies and imaginative minds* is a place that fortifies the dialectical dwelling in practice, the reflective exercise while experiencing, a place where ‘Gesellen’ meet and confabulate along with active ‘Meisters’ ready to offer the *gift* of teaching, as designers and caretakers of the structure. Different from the approach of *learning by schooling*, the educator’s metaphor shouldn’t compete with reliable interpretation of a tool. Both are to be complemented, yet if the structure is shaped as a classroom of academic time, ruled by control and standards, higher education may continue to be hopeless of positive changes for its users, as the whole house will be exposed to the remediation processes of digital media and its accelerated agenda. Using his imaginative reflection, Vannevar Bush made clear there was a price to pay, if our interest were to remain biased toward speed and reproduction,

Note the automatic telephone exchange, which has hundreds of thousands of such contacts, and yet is reliable. A spider web of metal, sealed in a thin glass container, a wire heated to brilliant glow, in short, the thermionic tube of radio sets, is made by the hundred million, tossed about in packages, plugged into sockets and it works! Its gossamer parts, the precise location and alignment involved in its construction, would have occupied a master craftsman of the guild for months; now it is built for thirty cents. The world has arrived at an age of cheap complex devices of great reliability; and something is bound to come of it (Bush 1945, 113).

#### 4.3.4. Digital media are tools

In change and movement, in the ephemeral and ubiquitous, in the non-fixation are vital characteristics to associate with natural learning, features that to a different extent have been appropriated by automata as they developed into mobile, seamless and pervading shapes. But as Levy (2007) indicates, a paradox took place as soon as the “new set of tools” announced by Vannevar

Bush,<sup>112</sup> came onto the scene. What originally was supposed to “buy people more time for creative reflection”, came to contribute to a social moment when increasingly we are “losing the time to look and to think” (Levy 2007, 248).

In the previous section, issues were stated to suggest that as soon as humans adopt the surface of the algorithmic sign, they end up accepting the ruling principle of *time* as the paradigm. In the interconnected possibility of devices throughout different spaces, ubiquity has been indicated as the *Trojan Horse* used by digital media to expand in the middle of a post-media society (see p.104). Nevertheless, while accepting the time artifice we are always in danger of turning education into a “commodity” in favour of stocking information, to producing faster in order to save time and to obtain well-being in its close connection to income and production (Illich 1975, 32).

While *learning by schooling*, students are confronted with descriptions of the outer world. A professor is the orchestrator, but he is also the main one responsible for their knowledge construction process. Inside a *university as a house*, he tells them about natural phenomena that take place in *the outside*. During the time he assumes to be a teacher –a role he is not fully aware of being identified with– the doors and the windows of this place remain closed. He is a *content expert* intending to convince them to change their perspectives about the outer space they perceive through metaphors, which are like windows of this house. Students listen to someone else’s experiences about the outside world behind a closed door.

In a way, these students are *users of metaphors*, unable to access the repertoire of meanings a professor has when referring to a certain topic. Moreover they can be seen as *users of a house with windows*, through which they can perceive an image of the outer space without being in it, experiencing it. Digital media is likewise another kind of window that presents us with simulations of a certain model of the world, interpretations created with algorithmic signs pushed onto a surface.

When *students are users of digital media as windows*, learners must concentrate predominantly on doing without reflecting, as acceleration and production are a priority within the mechanistic realm. Under these conditions, students as users become *immobile bodies with limited minds*, constrained inside a classroom as a house of closed doors. They follow this protocol until a clock or a calendar indicates a unit is over. Then *students as users* are liberated into the *outside world*, competent or not, to face *the foreign* and the uncertainty in it.

Unlike the *schooling* structure, a ‘Geselle’ and a ‘Meister’ come together in a trustful spirit as

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112 In his article, Levy’s judgement spotlights Bush’ “*As We May Think*” article. Levy emphasizes that most of the analysis that appeared out of this work did not show the reasons Bush had behind this imagined invention: a humanistic vision to conceive war technologies constructed by scientists, and transcend their use in favour of peace and to augment memory around all learned lessons. (Levy 2007, 239)

members of a guild, a family within a practice. Both can be seen as natural learners in a *university as a house with open doors*, where they engage in recurrent activities while thinking, altering their positions according to context. These are wanderers that go beyond the surfaces of *the inside* and *the outside*, following a dialectical exercise between *secureness and activeness*, into *confabulating and constructing*. While *learning by wandering*, 'Gesellen' are active craftsmen in need of expanding their *space of learning*, performing and taking part in different communities of practice that unfold as a networked structure to support them in their own and unique journey during their 'Wanderjahre'.

A 'Geselle' is different from a *Minervian*. His *space of learning* isn't constrained to remote protocols of control, instead he is free to expand and shrink his *space of learning* depending on the continuous flow of activities in which he is immersed. The tools that assist a 'Geselle' are needed to remain oriented, to develop his identity as craftsman, to record experiences throughout his journey or to work and engage in his craft. They won't have the qualities of a *stepping-machine*, because for it he would have to renounce his *experiential interface*, trading it for a mechanistic one. A 'Geselle' is assisted by tools with which to work to enhance his space.

A *university as a house with open doors* offers the necessary for "the making possible of, and the opening of, and the encouragement towards spaces: new spaces" (Barnett 2010, 82). Are current higher education structures meeting this philosophy? Once the clock or the calendar imposes a cut between the formal and the informal space, learners go beyond their classrooms and engage in enterprises within the structure of the outside society. While becoming outside, they are in need of assistance from their community of practice, from those who are like them or know better than they. To which extent are universities metaphors assisting them in the everyday? In relation to this, Wenger offers us some relevant ideas:

Learning creates emergent structures: it requires enough structure and continuity to accumulate experience and enough perturbation and discontinuity to continually renegotiate meaning. In this regard, communities of practice constitute elemental social learning structures (Wenger 2000, 226).

As stated, learners negotiate meanings in the light of their life trajectories. However, learning is an event that takes place in the presence of *perturbation*, that is, when a human isn't able to find a matching pattern experienced in his life to an emergent event (see p.177). This process leads individuals towards a realm of uncertainty and exploration. Facing this organic feature, a contradictory condition emerges in presence of the bureaucratic organization, which allows no doubt or changes (see p.36). A *university as a house with open doors* comes close to Barnett's idea of university, able to

extend “an invitation to roam, to wander” (Barnett 2010, 82), where learners as ‘Gesellen’ are wanderers, without any need to speed towards a destination. Instead, he prefers to heed his experiential space.

For students like ‘Gesellen’, digital media are tools that ease their continuous movement between reflection and action, allowing them to embrace *failure* the way Dahlbom and Mathiassen (1993, 93) think of it, always as a “great source for learning”. Despite the fact that “the process of trial and error seems brutally stupid”, any tool is ultimately designed to assist learners in this natural process of knowledge creation.

*Digital media as a tool* acknowledges the *experiential interface* and avoids acting upon it, in terms of standards, as is the case with literacy and the Western literate man, according to McLuhan (1994, 86). Given that the algorithmic sign adopts infinite shapes; *communities of practice as guilds* promote the acknowledgment of all different bodily senses, avoiding adopting just one approach. Similar to Dewey’s students in learning sciences (see p.194), a ‘Geselle’ expands his *space of learning* engaged in a dialectical movement that allows humans to explore perspectives in their unique way of constructing knowledge.

*A university as a house with open doors* acknowledges that in globalization, society favours vision in detriment of other human senses. *Digital media as a tool while learning by wandering* acts against this tendency in order to draw nearer to natural learning. Banks (2001, 7) affirms that “for centuries vision –sight– has been a privileged sense in the European repertoire, a point well-established by philosophers, social theorists and other cultural critics.” However, in McLuhan we find a good historical illustration:

To sum up, pictographic and hieroglyphic writing as used in Babylonian, Maya, and Chinese cultures represents an extension of the visual sense for storing and expediting access to human experience. All of these forms give pictorial expression to oral meanings. As such, they approximate the animated cartoon and are extremely unwieldy, requiring many signs for the infinity of data and operations of social action. In contrast, the phonetic alphabet, by a few letters only, was able to encompass all languages. Such an achievement, however, involved the separation of both signs and sounds from their semantic and dramatic meanings. No other system of writing had accomplished this feat (McLuhan 1994, 87).

In acknowledgment of this situation, a ‘Meister’ would attempt to include as part of his *gift of teaching*, strategies and tools close to Shklovsky’s approach with *defamiliarization theory* (see p.84)

presented in his essay "Art as Device". His claim was in favour of art to "give the sensation of things as seen and not known" and thus, rejected *automization* which "consumes things, clothing, furniture, one's wife, and fear of war" (L. Crawford 1984, 210).<sup>113</sup>

In *learning by wandering*, digital media are tools that help learners defy the given surface, to confront critically any interface and reflect beyond the standards of artefacts, because for 'Geselle' and 'Meister' it must be known that objects we refer to "[...] by our practical, daily, or even scientific discourses" cannot reflect nor be perceived in their "fresh originality" (L. Crawford 1984, 210).

Shklovsky proposed to "break down the indifferent recognition of automization" based on his artistic concern –literature, more precisely– for which he offered *defamiliarization* examples like "to tear an object away from its habitual recognition" by "not calling it by its name, but describing it as if seen for the first time; an event, as if it were happening for the first time" (*ibid.*, 210). The importance of perceiving in its relation to tools is fundamental here, especially when we examine one of Crawford's last remarks, thinking of written and oral language as tools:

But nothing protects Shklovskij's theory or economy from the 'fatal' consequences of writing-as-representation. "Trapped" in representation (in an understanding of writing as a re-presentation of its/an object), in references and drafts drawn on a perceptual presence writing cannot yield or make good for him, Shklovskij's theory is "fatally" unable to postulate the question of writing (instead of "art" in terms of "device") in such a way as to grasp that "automization" is inherent in representational writing itself, in its very economy (as much as, or more than in our perception of a supposed referent of such writing) (L. Crawford 1984, 210).

'Meister' and 'Geselle' are aware of this contradiction, and how it is that certain men are biased in favour or detriment of certain possibilities humans have through their experiential interface. It is clear that because of its continuous remediation process, digital media tend to blur, break and create a distance between learners and the 'actual' objects being interpreted through them (see p.59).

In response to this issue, a university as a house with open doors elevates the philosophy of *Bildung* to liberate the human being from ignorance, supporting him with constellations of communities of practice that are there to be experienced in activeness. This is away from fixation and

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<sup>113</sup> The pieces of text where I am quoting Viktor Shklovsky belong to his 1917 "Art as Device" essay. However, the version that I here make use of; is a translation out of the original version taken by Lawrence Crawford (1984) in his article Viktor Shklovskij: in Defamiliarization. As he clarifies "pages references are to the reprint and translations from the Russian are my own, but see also the translation "Art as Technique" in *Russian Formalist Criticism*, ed. Lee T. Lemon and Marion J. Reis (Lincoln, Neb., 1965), pp.3-24. "(Shklovsky 1965)



supporting our human capacities of movement between the inside and the outside. In this sense digital media tools for 'Meister' and 'Geselle' assist them as mobile bodies with imaginative minds. Barnett, recognizes this mobility in the sense of a liquid age, a concept close to Weibel's post-media condition:

Admittedly, new media –especially but not only the internet– are making possible new ways of reaching the different publics of the academy but still, the conditions of rational debate apply. Imaginative and daring in what it has to say; careful and sensitive to the norms of rational debate in the way in which it communicates its offerings: these surely have to be the epistemological norms of the academy (Barnett 2010, 28).

A 'Meister' isn't fighting a device. He integrates or designs tools to fit specific practices. A *university as a house with open doors* includes within its structure opaque and cool mediums (see p.59). Learners and educators in awareness of *bare machines* (see p.182), are openly invited to discover the operations happening behind any simulation of the outside world. They can identify the opaque tool in front of the human, having a non-opaque interface to look through. These circumstances will not affect digital media and its compulsive mechanism towards certainty, something useful to assist learners as they process data in its networked condition.

Aiming for mobility (see p.157) and the immediate (see p.48), *digital media* facilitates the access and management of certain kinds of information, relevant to *mobile learners with imaginative minds*. Assisted by these tools, learners are able to access and collect *trading currency* (see p.186), fundamental to the *mysterious* act of reflection. Knowledge is then constructed, through active engagement in practices and negotiation of meanings while being social. Nevertheless, 'Gesellen' and 'Meister' are aware that neither tools nor contents are the focus of importance, as information isn't the problem. Their *spaces of learning* are not reduced to information purposes.

Framed in a post-media society (see p.104), *digital media* becomes one single medium, interconnected and mobile. Issues like costs, hardware and computing power seem trivial, as tools of this kind get remediated to fit inside any *shoulder bag* a 'Geselle' carries during his journey.<sup>114</sup> Notwithstanding, in *learning by wandering* one is always aware that the illusion of security appreciated by Bollnow's *petit bourgeois* (see p.215), must be continuously questioned and adapted to the contextual conditions met in communities of practices, since the global illusion conceded mostly in

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<sup>114</sup> Among different initiatives in the computing market, there are projects such as C.H.I.P. project (Next Thing Co. 2015), which is a tiny computer is capable to operate all the basic functions a traditional desktop computer undertakes. The basic unit costs \$9 and its an open source project.

terms of digital media and its reach remains an issue in many regions like Latin America. Under the opaque interface, this remains a constant issue of debate, and has been since the early 21st century. J. David Bolter and Grusin observe:

The people are not in personal proximity; furthermore, geography, time zones, and social status are indeed limitations or rather characteristics of computer networks. Where we are located on earth (in what kind of urban or rural setting, in an industrialized or developing country) will determine how and whether we can connect to the Internet at all (J. David Bolter and Grusin 2000, 182).

Moreover, a university as a house isn't only considered in terms of windows and doors, but also it must be conceived of in terms of high ceilings and low floors (see p.92). As Ito et al. (2013, 61) explain, optimal environments for connected learning "are characterized by low barriers to entry and a multiplicity of roles, ways of participating, and improving and gaining expertise", a feature understood as that possibility that favours movement and allows the construction of pathways, hence accessibility among communities and environments. In this sense, computational languages are inspired as tools to fit these conditions. Languages as tools are necessary for 'Gesellen' and 'Meisters' in their journey beyond the interface of digital media, an effort that is supported by a constellation of communities of practice that take computing as their core, attending to freely open the understanding of such machines, undressing them as tools for conviviality:

Tools foster conviviality to the extent to which they can be easily used, by anybody, as often or as seldom as desired, for the accomplishment of a purpose chosen by the user. The use of such tools by one person does not restrain another from using them equally. They do not require previous certification of the user. Their existence does not impose any obligation to use them. They allow the user to express his meaning in action. (Illich 1975, 35)

Assisted by tools that dismiss the importance of interfaces, 'Geselle' and 'Meister' as Homo Fabers create new specific routes, techniques and conversations to grow into trajectories of experience around their craft. In awareness of the global, after returning from the vast landscape, they reflect on and stress the importance of their particular points of encounter, their unique characteristics and needs. Away from standards, their ultimate end isn't reproducibility. A 'Meister' relates to a 'Geselle', face to face, a one-one approach. Both aim for initiatives apt to set aside the automation of processes, as Shklovsky suggested, because craftsmanship always aims for fresh originality. This position provides

them clear positions about a tool's lack of neutrality:

Once a camera records images or events unique to a particular place and time, a disruption of privacy takes place. If the image is a work of art, its uniqueness is destroyed. A loss of its original magic, spirit, authenticity, or aura takes place once it is seen in many different contexts, for example, when reproduced in different forms such as on a postage stamp or a billboard it begins to mean something else and fragments into new sets of fresh associations (Lovejoy 2004, 23).

In view of these ideas, neither machines nor automatons are as helpful in *learning by wandering*. Disinterested in “context in which they are used [...] automatons perform functions that substitute for human information processing activities” (Dahlbom and Mathiassen 1993, 257). Instead, wandering learners work with *digital media as tools*. With them, the social element and the mastery of the thinking hand come into the foreground: as a “tool, a computer system is subordinate to the professional activity for which it is designed; viewed as a medium, a computer system is seen as a facility and framework for human communication and interaction” (Dahlbom and Mathiassen 1993, 258).

With *digital media*, the importance of locale and *Bildung* is fundamental in order to overcome the power imbalance, to grant liberation of self and freedom from ignorance, respectful of each learner's *space of learning* as it is constructed actively in different ways. *Digital media* are tools that pay important attention to the particularities of enterprises. Just like in the *cooking lab* where students were in charge of customization processes of their own tools, comparable are ‘Meister’ and ‘Geselle’ interested in developing their own media in the light of »singularity« presented by (Augé 1995). The place to support learning should be manufactured with *singular* objects, which denote the following:

“of groups or memberships, the reconstruction of places; the singularities of all sorts that constitute a paradoxical counterpoint to the procedures of interrelation, acceleration and de-localization sometimes carelessly reduced and summarized in expressions like ‘homogenization of culture’ or ‘world culture’ (Augé 1995, 39).

Dwelling in the middle of contradictions between the outside and the inside, ubiquity and creativity, the global and the local, unification vs. fragmentation, or standards and contexts, learners are assisted by tools that stress the importance of radical critiques, imagination and uniqueness. In *learning by wandering*, the educational structure avoids the standard interface, as labels constrain students as *users of information systems*, who are controlled within parameters. Instead, *a university as a house*

*with open doors*, pays attention to the engagement of specific practices, and with this “the permanence of having cedes to the constant flux of *doing*” (Sfard 1998, 6). The active participation of a ‘Meister’ is fundamental; he is the designer who offers educational structures and tools of low semioticity to a ‘Geselle’ (see p.195), opens riddles to let *Homo Ludens* aim for the completion of significance (see p.128).

In this understanding, the design of tools meant for *learning by wandering* could be compared to the characteristics identified within the design of *tokens* in the Neolithic token system (see p.53). In its basic *high ceilings* and *low floors* structure, Schmandt-Besserat (1992) describes some relevant aspects of tools at *universities as houses with open doors*, able to suit humans for their different approaches. These were based on a simple system where material shape was made out of clay, a common element that was accessible and easy to handle. The shape of the tokens was of low semioticity, as they were “plain and easy to duplicate”. To deal with elements, a one-one approach was used to deal with the units, where each element “stood for units of goods”, namely they weren’t representing any phonetic system, which made them manageable in any dialect.

Assuming that tools and enterprises in *learning by wandering* endeavor to be emergent, unfinished, shared, negotiated and with low semioticity, they may be recognized as *nodes* within a dormant *space of learning*, where each community of practice is like a *house with open doors*, always supporting *newcomers* and *oldtimers* within their crafts in their altering roles and membership.

Learning activities produce new activities (see p.120) hence expand the continuous and natural learning act. I suggest associating this idea with the notion of a *germ cell*, a concept presented in Engeström and Sannino (2010, 5), to remember the importance of simple units, initial abstractions that are apt to grow in richness, abstractions that evolve into concrete items by means of a “system of multiple, constantly developing manifestations”. These are close in the sense of boundary objects and activities, able to bring together people (see p.145). In this same fashion, the *germ cell* is likewise a metaphor, a *boundary object* that allows interconnection and interdependence and, according to Engeström and Sannino, permits various activity systems to “[...] form a producer–client relationship, a partnership, a network, or some other pattern of multi-activity collaboration” (Engeström and Sannino 2010, 6).

A *university as a house* is a center for learners, where men are safe and at ease away from the foreign. Yet, when the doors of this house are closed and all windows become a distraction from the rhetorical description a professor offers, this structure constrains the *space of learning*, uninterested in jeopardizing control in the presence of *germ cells*. Beyond its walls, a boundary divides “inside and outside, membership and non-membership, inclusion and exclusion, in discontinuities” (Wenger 2000,

119).

Differently, a *university as a house with open doors* is a structure that fosters and supports students as wandering learners in between *the inside* and *the outside*, over boundaries, beyond the surface. In this case, tools and activities are like open doors, all of them “peripheries –no matter how narrow– that refer to continuities, to areas of overlap and connections, to windows and meeting places, to organized and casual possibilities for participation offered to outsiders or newcomers” (Wenger 2000, 120).

*Digital media* are tools like *windows* and *doors* to be taken as the elements of a house that offer connections between *the inside* and *the outside*. This is at the same time the basic understanding for a boundary object, a *germ cell* that belongs to a constellation. Boundary objects are metaphors, because they provide “an invisible web” (Erickson 1993, 66) and unfold as an extended structure of relations in connection with given concepts. Like in the *Desktop metaphor* (see p.182), they are descriptions of natural phenomena shaped on constructed knowledge and experience. (see p.146) In awareness of Wenger and Star and Griesemer's notions, some recognizable characteristics describe activities and tools within *learning by wandering*. Based on Star and Griesemer (1989, 408) a *method* is a *boundary object* if:

1. many participants share a common goal. Those that do not share the goal may participate using other cold mediums
2. all participants come to literal agreements in favour of a practice;
3. for some participants this literal, concrete goal is sufficient for their purposes;
4. for others, a literal concrete goal is only the beginning of a longer process within a constellation of practices of relevance to their craft

Furthermore, Star and Griesemer (1989, 404) indicate next to these characteristics, what for me are some approaches to negotiation of meanings, useful for members of a community of practice whenever they come together in the light of boundary objects. Based again on their reflection, problems can be managed because of contrasting perspectives:

- via a “lowest common denominator” which satisfies the minimal demands of each world by capturing properties that fall within the minimum acceptable range of all concerned worlds; or
- via the use of versatile, plastic, reconfigurable (programmable) objects that each world can mold to its purposes locally; or
- via storing a complex of objects from which things necessary for each world can be

physically extracted and configured for local purposes, as from a library; or

- each participating world can abstract or simplify the object to suit its demands; that is, “extraneous” properties can be deleted or ignored; or
- work in the world can proceed in parallel except for limited exchanges or standardized sorts; or
- work can be staged so that stages are relatively autonomous.

Digital media is a powerful tool for learners in a post-media condition. However, I would suggest that those digital mediums that are bare of opaque interfaces, with low semioticity, cold and non-transparent, tend to take part as boundary objects. Among many different types of doors and windows, these elements assist the dialectical wandering between the inside and the outside. Boundary objects are contextual tools that correspond to the learner’s needs in his natural condition. A boundary object is already there, something to be discovered among ‘Gesellen’ and ‘Meister’, specially because practices and communities aren’t created like a Homo Faber creates an information system. Instead, boundary objects are more like shared questions, open and capable of triggering new instances. Wenger explains the importance of peripheral participation (see p.114) and boundary objects to expand the *space of learning*:

Learning communities do have a strong core, but they let peripheral and core activities interact, because it is in these interactions that they are likely to find the new experiences and new forms of competence necessary to create new knowledge. (Wenger 2000, 217)

A *university as a house with open doors* conceives the idea of *spaces of learning* driven by the natural will a learner has towards craftsmanship. It can begin with a powerful question or metaphor, with an enterprise of practice; later on it may unfold in an altering trajectory, or collection of trajectories that an individual undertakes in unique and contextual ways. Just like the ‘Geselle’ who decides to go beyond his homeland, beyond the boundary that as a wall constrains him, in *learning by wandering* humans have a natural curiosity for learning.

They mismatch meanings and out of this perturbation, new elements are added in their repertoires. In emergent scenarios they get surprised, and perform in given ways to collect new pieces of information, each of them relevant to constructing knowledge about the outside world. A ‘Geselle’ is supported by a guild with members like a family. This structure supports his will to learn on a journey of contradictions, between *the inside* and *the outside*. But before he departs, some tools are there with

him.

A *map* indicates basic information to remain oriented. Different to the restricted curriculum of a student at school, this map is an abstraction that indicates locations, places of relevance for the practice of this student. It is meant to support him to explore the unknown, avoiding a destination but open questions without certainty of answer. Instead of learning contents, in this map he learns of localities where surprises await. Each highlighted point in this map can be compared to a boundary object, where practices and communities of practice emerge naturally and are in that moment active.

In *learning by wandering*, activities are metaphors that like boundary objects unfold in recurrent instances and originate constellations. Communities of practices and guilds blossom around them, with learners engaged in active participation and reflection, confabulating and filling them with unique meanings within altering structures they construct. At *universities as houses with open doors*, learners are provided with *constellation maps*.

Because communities of practices are organic structures conformed by members of altering conditions, trajectories, participations and masteries, they are apt to provide lively descriptions of people's experience, each of them with unique *spaces of learning* relevant to fabricating *maps as tools* for orientation within given crafts.

Bearing in mind that educators are fundamental members within the educational structure, we may think of them as *map designers*. A 'Meister' designs strategies for 'Gesellen', granting them a customized tool that assists them while exploring their craft. This map is the updated illustration of an *unfinished* scenario, containing certain details about the liquid network of unfolded practices in their - current state of interrelations. It provides the 'Geselle' with an *unfinished map*, a tool that visualizes instances of an *invisible web*, relevant for members of a given community of practice. Because of their altering condition, these are disposable maps of diverse trajectories, attempting to show a landscape of practices that are assembled ultimately by a 'Meister', in his condition of *phronesis*. In its intimate relation, while being actively engaged one-one with a 'Geselle', the educator is able to offer his *gift*, proposing to teach not only techniques or his lively metaphors about their craftsmanship, but also the locations of new *boundary objects* of potential relevance for his construction of knowledge.

This exercise involves a high level of prediction and categorization by a 'Meister', and a fine sense of intuition and imagination. *Constellation maps* are cornerstone tools for *learning by wandering*, and a fundamental task within *universities as houses with open doors* is to prioritize the elaboration of *constellation maps*, taking in consideration all the possible shapes they can adopt. Different to Laurillard's teaching approach in a second-level order, (see p.160) maps are descriptions of the world of low-semioticity, as they aren't meant to focus on specific illustrations of someone's experience of the

world, but a description of relevant locations reported by members of a community of practice. In these terms, von Glasersfeld makes an explicit mention that discusses *knowledge* with a *map*:

[...] knowledge does not provide a representation of an independent world but rather a map of what can be done in the experienced environment (von Glasersfeld 1991, 4).

In addition to an orientation tool, the wandering learner is in need of a recording device to expand his memory; an action close to a reminder of Vannevar Bush's vision of the *Memex*. A 'Wanderbuch' [travelling book] is presented as the second core tool a 'Geselle' takes with him when moving beyond the boundary of *the inside*, into the *outer space*. Longing for the distant and exploring a landscape of practices, the 'Geselle' engages in action, holds conversations, observes, reflects but also *documents*. This action becomes elemental for the design of *constellation maps*, as later facing his community of practice, the 'Geselle' raises awareness and reports with lively descriptions about his *space of learning* in the outside world. While illustrating the singularity of each of his experiences, more questions and clues will emerge. Once collected, the 'Meister' and others include these pieces of information in the latest version of the map, fitting a satisfactory strategy to the existing context.

The 'Wanderbuch' is a tool to shrink the *space of learning* and to reflect. In the middle of its mysterious process, a 'Geselle' behaves like the ethnographer who collects information with his *experiential interface*. This includes: a note, an image, a sound, different formats of information, new *germ cells* to consider, emergent enterprises of interest for later performance as soon as he comes home, to share with others. In this sense, the 'Wanderbuch' is a unique compilation of selected information for a given craft. Every time a 'Geselle' returns to the secure place within a *university as a house with open doors*, in his 'Wanderbuch' he will keep record with rich metaphors to obtain a new illustration of the outside world, always a surprise.

In *learning by wandering*, *digital media* are *tools* that may assist 'Gesellen' navigate their continuous journey and record it to reflect upon later. In times of a post-media condition, they might extend learners' possibilities into becoming, altering windows and open doors, an interconnected landscape with an unfolded web of boundary objects, each being a core for different communities of practices. Facing this landscape, members within their altering roles, trajectories and repertoires will be part of a *one universal medium*, which not as an opaque interface but a map with low-semioticity, may offer continuous hints to approach mastery in craftsmanship (see p.112):

[...] The ability to have multiple levels of involvement is an important characteristic of communities of practice, one that presents opportunities for learning both for



outsiders and for communities. (Wenger 2000, 117)

For *Homo Ludens* this landscape could be taken as a series of recurrent games. Instructions, riddles and moves enclosed by uncertainty. In such terms, a *germ cell* may embrace the characteristics indicated in the Neolithic token system, open and plain, with units independent of any globalized system, almost like a system of 'secret' messages similar to those of the 'Gesellen' on their journeys, belonging also to their specific ways of communicating.

#### 4.3.5. Spaces of learning are the *telos*

A *university as a house with open doors* is attentive to *spaces of learning*. It leaves aside the primacy of academic time, which aims to compulsively control human education in terms of measured resources, to instead promote the idea of *spacious time* (see p.105). Under such terms, it has been stated that students as 'Gesellen' construct their knowledge in their practices, learning naturally in the middle of contradictions like the one existing between the unknown and distant 'Fernweh', and the *secureness* yearning of 'Heimweh' (see p.205).

*Practices* are pervasive, and have a tendency to become *boundary objects*. Around them, individuals who are *naturally* interested coincide around them and get engaged in some *enterprise*. As their participation grows continuously, they become members and eventually they form communities of practices. There, *activities* relevant to a common *craftsmanship* are undertaken by *learners*, and as they partake in activities, these unfold in recurrent change.

Members in communities of practice behave differently, always intimately congruous to their contexts, necessities and curiosity. As they continue actively engaged, various types of membership and participation are recognizable, some of them becoming *oldtimers* of known repertoires that are acknowledged by the rest as 'Meisters', craftsmen who stand out because of their *mastery*. They also perform decisive actions of intervention in benefit of an educational design that ultimately is there to accompany other members of the guild, and their *spaces of learning*.

A *university as a house* is a special place, where a 'Geselle' is at ease and in peace, able to find leisure and to remain safe from what is foreign. There, his *space of learning* isn't understood in terms of objectiveness, but in terms of qualities according to human values. For instance, if one were to say something about the temperature of a given place, a crossed reference to *mathematical space* and experienced space may be stated (see p.132). First, a room would be measured in terms of mathematical space if a quantitative notion of *warmth* were given. It would depend on a measuring

instrument to obtain an *objective* number; an outcome that is indifferent to human presence or human experience. Distinct to this position, the *experienced space* would define the temperature of this room, explaining that for humans, it would be about values such as how hot or cold for instance.

The *space of learning* is defined by the *human's first interface*, available only in the presence of bodily humans aware of their *experiential interface* (see p.219). To learn naturally and deeply about the world, humans must embark on a dialectical sequence between reflection and action, for which their *actual experience* is fundamental (see p.48). The *experiential interface*, always uncertain and deceitful, must be assisted by tools and methods in order to reflect further and reach *phronesis* (see p.102); nevertheless 'Geselle' and 'Meister' are certain that there is no substitute to getting closer to natural phenomena, more than experiencing it with their bodies. In J. David Bolter and Grusin, a good example to illustrate this issue is given:

What rock music seems to offer (and indeed what Wagnerian opera offered to the nineteenth-century German audiences, or flute music in the Lydian mode to Plato's Greeks) is pure experience, pure authenticity, real in a sense that the listener's perception cannot itself be deceived (J. David Bolter and Grusin 2000, 72).

A *university as a house with open doors* embraces learners as active men. Cusack (2008, 36) identifies the significance of this condition within the educational stance of the wandering learner as a subject of education. Close to Bollnow's warning not to fall prey to the illusion of fixed secureness by remaining inside a house (see p.212), Cusack describes a nomadic, unsettled attitude against the paradox of security.

For the author, it is clear that the *Bildung* image that sets a learner free is fundamental, and man in fixity is always in danger. The wandering learner in 'Wanderjahre' must then abandon the settled life but also, he must come into "the exercise of a specialized activity", which implicitly means men must totally renounce the idea of autonomous, in order to become social because of their restricted capacities as individual beings (Cusack 2008, 36).

The tension between *the inside* and *the outside* is once again highlighted, insofar as it clarifies the importance of *the outside world* in the trajectory of experience of a learner. However, I find it necessary to discuss a missing concept that is helpful to understand the human value of *a house*, the aspect that makes it a special place, the place a 'Wanderer' longs for, when being in the distant. In Bollnow's text, the notion of 'Gemütlichkeit' [homeliness] captures this essence of the singular, what a learner finds and may be expressed as coziness back at home.

In this sense, when a learner finds shelter, his dwelling state is in rest and comfort, a fundamental

contradiction if compared to his continuous activeness in life, while doing his craft. The 'Geselle' on his journey is always keen about new practices, communities of practice or just engaging deeply in a known enterprise. But while being sheltered, in *the inside* space, 'Gemütlichkeit' is a special quality that he wouldn't find in *the outside*. This certainly is a matter of interest that a *university as a house with open doors* may aim at, whenever the 'Geselle' looks for the intimate secureness in this place, close to the early concept of *scholé* in ancient Greece, a place for leisure (see p.108).

Bollnow (2011, 142) explains that something 'gemütlich' [comfortable] carries an emotional aspect directed to narrowness: man "allows himself to relax in peace and quiet" in narrowness. Not being caged but sheltered, the space of learning inside shrinks into 'Gemütlichkeit', a reflective and almost contemplative idea of non-activeness, when a time of "comfort represents an essential component of the domestic sphere in its contrast with the tension of life outside the house" (Bollnow 2011, 143).

A *university as a house of open doors* certainly dedicates its concentrated attention towards the space of learning, which includes as well the aspect of a house that is provided with *windows, doors, or high ceilings and low floors* (see p.92). But it becomes of relevance now, to reflect on some of the characteristics that make a place worthy of 'Gemütlichkeit'. For this, Bollnow provides a useful list that I suggest considering closely for any educational structure that houses 'Gesellen' while *learning by wandering*.

1. To start with, the dwelling space must give the impression of seclusion. If it is the task of the house to provide a refuge from the outside world, this must also find expression in the nature of the dwelling space (Bollnow 2011, 143).
2. [...] the space must be so big that it can really be filled up by the life of the person dwelling in it. And that of course varies from one individual to another.
3. [...] the furniture must fill the space in such a way that the impression is neither of emptiness nor of overcrowding.
4. [...] the colour of the walls is also part of a warm atmosphere.
5. [...] the room must also show that it is lived in, and this means that certain signs of life [...] should be recognizable in it.
6. [...] The furniture in the room must also show that it has been lovingly chosen and cared for. Decidedly tasteless objects and cheap mass-production items are out of place. But this does not mean that particularly valuable pieces of furniture are necessary. (Bollnow 2011, 144)
7. [...] The objects in it must be taken into the life of the dweller by the practice of being looked after.

8. [...] So the true dwelling is not artificially created, but gradually grows and takes part in the reliable security of slow growth (Bollnow 2011, 145).

Notice the selection of aspects highlighted by the author, in order to pay close attention to the *experienced space*. In it, one can find implications for sound, temperature, contextual aesthetics, speed and the idea of the unique and the individual, hence stressing the importance of dwellers. It becomes important to realize that assuming these considerations, it would involve the dedicated engagement of a 'Meister', who remains aware of each of the 'Gesellen' in their relation one-one, taking care of spaces of 'Gemütlichkeit' inside a *university as a house*.

It would be different from the traditional classroom we find in Germain's pictures (see p.94), where elements follow a protocol that fits the teachers' needs when contents must be delivered and evaluated. In *learning by wandering*, elements tend to flow and alter in correspondence with those learners sheltered at the house, to let them shrink their spaces in comfortable gesture, to elevate their interest towards intimate conversation and meaningful dwelling.

A university as a house with open doors should therefore avoid therefore becoming a »non-space« in terms of Augé, which for him, are fabricated spaces in the following way:

"A world where people are born in the clinic and die in hospital, where transit points and temporary abodes are proliferating under luxurious or inhumane conditions (hotel chains and squats, holiday clubs and refugee camps, shantytowns threatened with demolition or doomed to festering longevity); where a dense network of means of transport which are also inhabited spaces is developing; where the habitue of supermarkets, slot machines and credit card communicates wordlessly, through gestures, with an abstract, unmediated commerce; a world thus surrendered to solitary individuality, to the fleeting, the temporary and ephemeral" (Augé 1995, 78).

This notion emphasized by Augé is also suggested by J. David Bolter and Grusin, when the oddness of certain spaces is observed like an "airport at three o'clock in the morning, or a theme park after closing hours," (J. David Bolter and Grusin 2000, 177). This is clearly associated for them with the impoverishment of meaning, conferred to these structures exclusively based on an interface ruled by bureaucratic time. But, is this experience so different during summer break at some university campus worldwide? Regulated through opaque protocols, the student's *space of learning* at universities after official hours changes significantly. Constrained in a *nested doll principle*, (see p.226) the educational structure will emerge at a given calendar day, at some hour, intending a kind of knowledge which is

traditionally fragmented as a dichotomy between the theoretical and the practical. This *space of learning at universities as houses with closed doors* is identified within the boundaries of *formal education*, different from the *informal scenario* that takes place in the everyday (see p.112).

A *university as a house with open doors* acknowledges the *post-media condition*, where one universal medium unveils the interplay between the *formal* and *informal*, the *local* and the *global*, the *inside* and the *outside*. This setting should be taken in consideration in any educational structure that claims to be humanistic. In this sense, the *space of learning* shouldn't be contained or measured, but assisted throughout a landscape of practices in constant change. Dahlgren explains it the following way:

The discourse of joint knowledge production underlines the importance of seeing higher education programmes not situated in 'ivory towers', but within a close-knit and dynamic relationship with the surrounding society with no clear-cut demand-supply relationship.[...] the call for an alternative pedagogy of transition seen together with the previously described discourses points at the need for a theoretical framework that allows a simultaneous focus on the individual, the culture of the higher education institutions, the requirements of the work task and its broader contexts (Dahlgren et al. 2005, 39).

Similar to this previous standpoint, Ito et.al (2013) point their attention to that which is "openly networked", stressing the importance of participation in an open mesh, a condition that grants access to a "wide range of knowledge and resources across the boundaries of school, home, and after-school settings" (Ito et.al 2013, 76). It is fundamental to be aware of this, as it considers natural learning within an indefinite space, *extended* or *narrow* as necessary. In Ito's reflection, we are told that "connected learning environments are based on principles of openness, accessibility, transparency, and extensibility to keep barriers to entry and participation low" (ibid., 76), key factors mentioned throughout this document. These authors go even further by describing how this is applied to spaces with an "open-door policy" (ibid., 76).

A *university as a house with open doors* shelters learners as good dialecticians (see p.100). They are mobile bodies with imaginative minds, wandering away from protocols towards control. These students aren't expected to have fixed results, because for them learning is about experience and reflection. Closely related, Lave (2012b, 165) expresses that "[...] we need to ask *how* learning works in the world *through* the conduct of everyday life (or dwelling, or skill) and, second, we need to ask how conducting everyday lives, or craftsmanship take the forms and relations they do *because* they are

in part practices of learning”.

In *learning by wandering*, educational structures consider spaces of learning their *telos* (see p.193). A ‘Meister’ can organize an educational design able to support multiple trajectories, where ‘Gesellen’ control their own decisions within an environment of trust, conversation, and the *unfinish* (see p.214). Committed to craftsmanship, a ‘Geselle’ learns through concurrent activities that are clustered or dispersed in a landscape. Each node within this web may grow into a community of practice of altering complexities, each of them furnished with boundary objects as *doors of a house*.

On their journey, the educational design will not be a burden for the ‘Meister’ or the ‘Geselle’, as their interest remains bound to active participation in skills, each performing as a *newcomer*, *oldtimer*, *broker* or *full participant*; known because of their *mastery* or *phronesis*. Their *space of learning* is supported by a changing educational structure, able to augment the *experiential interface* of learners, their needs and their *experienced space*. On the other hand, an institutional boundary does not necessarily outline a community of practice. Careful scrutiny of its day-to-day existence may reveal that a work group, classroom, committee, or neighborhood does not actually constitute a community of practice. It may consist of multiple communities of practice, or it may not have developed enough of a practice of its own (Wenger 2000, 119).

In *learning by schooling*, a student as a wanderer is unable to experience the wide and distant landscape. His perspective is enclosed within a “geometric presentation of the space” (Bollnow 2011, 181), locked inside a *classroom as a house with closed doors and distracting windows*, where a professor is narrowly intent on delivering fixed contents. This place is experienced just like a “carefully measured road distance” (Bollnow 2011, 181) interesting to *road users* with the exclusive goal of reaching a destiny, as fast as possible.

In *learning by wandering*, a ‘Geselle’ experiences an educational design in favour of contradictions, where the place is continuously created “through human activity, through ‘life’ itself” (Bollnow, 196). He dwells in a *space of learning* of altering nature, being constantly challenged under connected practice and negotiation of meanings. Under such conditions, this learner “moves with total safety, everything here is ready to be grasped and available for use” (Bollnow, 200), and as he moves in awareness of his *experiential interface*, he gets immersed in the “building up of total space, and distinguishes between the corresponding forms of space, seeing space, hearing space and touching space” (Bollnow 2011, 202).

Thinking of teaching structures ruled by time makes it possible to believe in *distance education*. Under such conditions, the idea of universities dissolves into initiatives closer to the *Minerva* approach, where students are in global immersion, remotely controlled in their *post medial condition*. Yet, when

thinking of teaching structures ruled by space, it encourages us to develop universities into constellations of practices, places and spaces. In Barnett's words:

A university, after all, is nothing unless it is in part a space for structured inquiry. It has ways of going on. But these ways of going on are procedures that open a set of infinite spaces in which individuals – whether alone or in groups – can be creative (Barnett 2010, 53).

## Chapter 5: The space of learning at UCR / Scrapbook of a journey

If you are interested in people, in what they do and what they achieved, in how they organize themselves and what they believe in, you will have to approach them as one subject talking to another. Certainly you can observe them, collect statistical facts about them, experiment upon them, genetically manipulate them, and simulate their behavior on your computer. But in doing all this you will learn only about their surface, and this surface will change, will remain out of your control, due to the fact that you are dealing with people. (Dahlbom and Mathiassen 1993)

In order to complement my theoretical discussion, contextual exercises were crucial for the development of this thesis. Shaped as an ethnographical study, my attention was on the Universidad de Costa Rica, a public institution founded on three pillars: *teaching, research* and *social outreach*. UCR comprises seven different campuses in all of Costa Rica's provinces: Rodrigo Facio - *in San José, Costa Rica's capital city*-, Guanacaste - *in Liberia together with a branch in Santa Cruz*-, Pacific - *in Puntarenas*-, Golfito - *in the town of Golfito*-, Atlantic - *in Turrialba together with its branches in Paraíso and Guápiles*-, Caribic - *in Limón and its branch in Siquirres*-, Western Campus - *in San Ramon, together with its Tacaes branch*- and the Inter-College Campus -*in Alajuela*-. In 2013, more than 38,000 regular students were actively enrolled in different study programs, and 5,044 professors lead their way in study programs (Universidad de Costa Rica 2015).

The Rodrigo Facio Campus is the largest branch of the institution, where most of the teaching and learning initiatives occur. Overall, there are six different study areas currently offered: (1) Arts and Letters -*comprises (a) Fine Arts and (b) Letters Colleges*-; (2) Agrifood Sciences -*comprises the Agrifood Sciences College*-; (3) Social Sciences -*comprises the (a) Law School, and (b) Education, (c) Economic Sciences and (d) Social Sciences Colleges*-; (4) Health -*comprises the (a) Medicine, (b) Dentistry, (c) Microbiology and (d) Pharmacy Colleges*-; (5) Basic Sciences -*comprises the Sciences College*- and (6) Engineering - *that comprises the Engineering College*. Moreover, in the Rodrigo Facio Campus each field of study belongs to differentiated structures known as *School Assembly*, and together with other homologous Schools, *faculties* are formed.

Different and comparable to the size of their academic body, each campus branch at UCR is organized independently. Majors are offered to students in accordance to socio-economical contexts



such as number of inhabitants, (Fig. 13) and job demands, these among some of the different criteria listed for each region in the country. In their formal administrative organization, all campuses different from the Rodrigo Facio have a joined Assembly, conformed by representatives of each of the majors offered on site.

Furthermore, campuses that offer the same major do not organize necessarily the same way. While many work along the Rodrigo Facio teaching line, most of the study programs aren't based on common guidelines or contents. The premise is limited to following the official curriculum. Moreover, some study programs are exclusively offered at certain campuses, others split and are offered in mixed locations. However, as already noted, this does not imply an orchestrated setup in terms of a pedagogical strategy at UCR throughout different contexts.

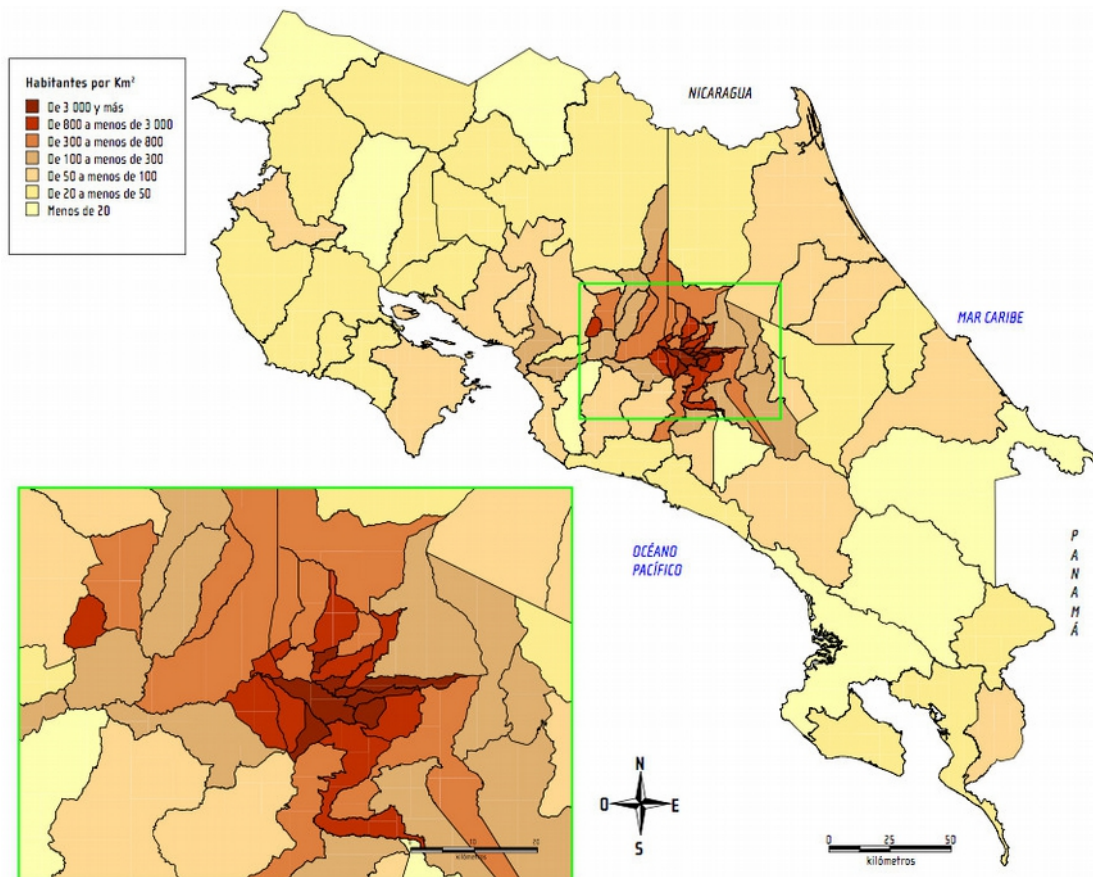


Fig. 13. Population density throughout different regions in Costa Rica. (Instituto Nacional de Estadística y Censos 2012, 122)

It is important to state that the interpretation I offer in this thesis is biased by my experience as a public servant at the Departamento de Docencia Universitaria - DEDUN<sup>115</sup> that belongs to the School of Teacher Training and Shared Majors, within the Education Faculty<sup>116</sup> at The Universidad de Costa Rica. My affiliation with this space began in 2005, when I joined a multi-disciplinary team that as part of DEDUN, attempts to assist all UCR educators in their teaching activities.

Through different educational efforts, the final goal of DEDUN is to foster better teaching practices, aware of everyone's disciplinary background and concentrated on university education as the point of interest. In this sense, we may consider teaching as a boundary object, an element that plays a central role and bridges all these different contexts, hence agreeing with Imbernón Muñoz (2000, 42) who suggests that the act of educating university teachers is an eminently contextual venture.

Having said that, I acknowledge that after a four-year research process, people and institutions undergo changes. Despite the challenge, I have continued my actual activity away from the dynamics of the University of Costa Rica<sup>117</sup>, and my reflections have been conceived in constant reference to the *space of learning* experienced as a member of other communities of practice at UCR. First, in 1999 when I joined this institution as a *fine arts* student, and six years later, assuming a new role in teaching.

## 5.1. UNIVERSIDAD DE COSTA RICA, / THE SHAPE OF A LATIN AMERICAN CONTEXT

As it will be shown in this section, *space* alone is a notable topic for different endeavours at Universidad de Costa Rica. During the last few years, the importance of this topic has grown in various ways, as it has been stated by UCR's rector Henning Jensen. (Lopes 2015) First of all, in its regional context during the last continental Summit in Panama, he underscored the relevance of academic mobility to support common spaces within America, urging the creation of new politics of state. Together with leaders of numerous countries and education decision-makers in Latin America, Dr. Jensen recognized an imminent

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115 A suggested English translation is "University Teaching Department"

116 It is formed base on different Schools: School of Teacher's Training and Shared Majors, School of Counselling and Special Education, School of Library and Information Sciences, School of Physical Education and Sports and the School of Education Administration. <http://eng.ucr.ac.cr/estudiantes/carreras/>

117 This is not entirely true, as there was a five-month fieldwork phase at UCR in 2014, when once again I held a certain degree of membership in the community, this time as a "participant observer".

necessity to bridge higher education academies within the region, admitting that first we must confront unsolved issues that are conditioning mobility at universities, such as recognition and equivalence of degrees between nations, and to overcome administrative barriers in terms of teaching quality within the continent.

But not only in its political and regional domain, does *space* become a relevant element at UCR beyond the generality of these settings, where efforts are currently invested, for instance, to improve the institutional infrastructure and expand the place for the academic community. In this sense, the Rodrigo Facio Campus is currently under an extension process, extending a contiguous parcel established with a complex of buildings. As part of the inauguration events, different debates and conferences have been scheduled to reflect on pertinent views.

Among these events, Prof. Dr. Mauricio Leandro presented a talk that relates closely to the topic presented in this thesis, since the point of his discussion was “plenty of places, one space: identity construction in the light of environmental psychology” (O’neal Coto 2015). During his talk, Leandro presented the importance of spaces and places for the construction of memorable events, where experiences play an important role next to imagination, making places something of import. With his message, Leandro invited everyone belonging to UCR to think of these new buildings as places for movement, sites enriched with details and affordances, intriguing and navigable, adapted to people’s requirements but specially students in their quest to fulfill actions of relevance, from studying to sleeping.

Moreover, Leandro’s claims may be associated with Vladimir Quesada’s reflection on space as the “third teacher”<sup>118</sup> (Quesada Santamaría 2014). For him, space is acknowledged as a pervasive element that comes naturally in life. From the first moment, and depending on the availability of elements to interact with, the more we will learn. In addition, Quesada recognizes that one of the issues in formal education is the absence of intuitiveness in learning, for him a basic element for creating spontaneous spaces. Inspired in his background as architect, he insists on the dual interrelation between actual architectural space and the external space, talking about “*módulo flexible de aprendizaje*” (flexible module learning), while being aware of the importance of context, where everyone should be invited to join, and where the community takes part in what they do there including dance, textures, and sports.

Complementary and to my mind the most significant collection of digital documents I came across, is at the same time a set of plausible opportunities to rethink The Universidad de Costa Rica’s educational structures in terms of the experiential space, fostering governance in favour of such

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<sup>118</sup> According to Quesada, family is the first teacher; teachers and colleague students are a second space; and a third space is each teaching unit. Reggio Emilia is the founder in the philosophy for his approach.

configurations: the VII University Congress in 2014 at UCR (see *Annex 01*).

Entitled *Reforms in organizational structure and academic affairs*<sup>119</sup>, this Congress is the official event organized every 10 years at UCR as a mechanism to openly reflect on institutional reality, its administrative and academic extensions and the current bond between the Universidad de Costa Rica and its surrounding society. The entire academic community within the institution is invited to attend and take active participation, specially because it is the official channel where participants settle, approve or dismiss motions that later on serve as foundational matter for decisions on concrete development actions for upcoming years.

Within this context and after reviewing the records of the latest convention in San José, Costa Rica, several consented points can be closely related to founding arguments presented in this thesis. As this can be seen in *Annex 01*, many of these discussions take on space as their central issue: either to be augmented or linked to while aided by digital media (see *Annex 1, motions #EGH-53, #VU-24*). The idea of places and spaces at university is key to understand the divide that prevents individuals from accessing educational structures at UCR depending on their location in the country (see *Annex 1, motion #VUS-05*). Not reduced to this claim, the idea of a *healthy life* is underscored by other presenters as they associate sedentary life styles in combination with *narrow spaces*, where the body remains constricted to the ruling conditions of certain contexts that aren't challenged within the educational realm at the Universidad de Costa Rica (see *Annex 1, motion #VUS-13*).

Similarly, other proposals pointed in favour of diversifying the approach towards knowledge as a joined construction throughout spaces and contexts, this instead of the current model that highlights specialization and disciplinary fragmentation as the prevailing option (see *Annex 1, motions #QA-2, #QA-13, #QA-38*). This analysis seems to be linked with complementary positions that seek to motivate us to reconsider the idea of *campuses*, perhaps in order to get rid of our strong dependence on a central and uneven structure, whenever we think of regionalization at UCR (see *Annex 1, motion #EGH-2*).

In each of their claims, there seems to be an interest to broaden the idea of university, to stimulate in students and professors circulation in different national regions, this through institutional exchange and teaching study programs, social outreach and research between campuses and universities. Overall, it is reported that such debates concerning “regional campuses<sup>120</sup>” and development

<sup>119</sup> Own translation after its original title “Reformas en la estructura organizativa y en el quehacer académico”

<sup>120</sup> Here is acknowledged the misleading effect in the notion of “regional campus” as a category within the UCR context. After several conversations and discussions held with teaching personnel and students of different UCR campuses (not including Rodrigo Facio), the existence of a negative perception among many of them was openly discussed, every time their affiliation and institutional community is referred as a *regional* one, different to a *central* one. It would be contradictory to talk in terms of

manoeuvres at the Universidad de Costa Rica, triggered a confrontation of different visions in the audience. Taking into consideration academic, administrative and legal perspectives related to new forms of academic life, they questioned basic pillars relevant to university life. However, leaving aside the commitment and eagerness of those participants willing to set precedents in order to benefit regional development as one of the institutional priorities, challenges in term of participation and membership seemed to remain.

All in all, I find that these proposals may be interpreted closer to some of the discussions held previously in this thesis, specially in the effort to clarify the restricted concept of *spaces of learning* as houses with closed doors and distracting windows (see p.208), structures that are organized by teachers who purposely limit their educational designs in order to cope with teaching as a burden (see p.165) as if learning were an event based on fixed contents. Instead, we may perceive in the background of each of these motions the concern to construct bridges between *the inside* and *the outside* of our knowledge despite the opposition expressed by some educators at UCR, for instance in reference to the curricular flexibility by increasing access to academic offerings at UCR (see *Annex 1, motion #QA 13*).

Moreover, other petitions referred directly to issues such as opening times and improvement of study spaces at UCR (see *Annex 1, motion #VU-20*). In this specific case, active learners belonging to the *Students Association at UCR* highlighted the importance of physical spaces and their availability, ready for them to be occupied correspondingly to academic responsibilities. Following these arguments, it is possible to associate their worries with the importance of space beyond the classroom, in this case related directly to the need of students for improved education processes. Thinking in terms of an “*open-door policy*” society (see p.253), these elements should become a cornerstone in *openly networked structures*.

It is important to mention that regardless of the seriousness of these debates, challenging circumstances were evidenced, since most of the proposals at the VII University Congress appeared to be lead by Rodrigo Facio Campus participants *only*, a situation that was strongly questioned by all participants, given the importance of integration and negotiation with all other UCR campuses (Vargas Morera, 2015). This may be interpreted as a relevant weakness since the contextual depth and lively experience of those persons immersed in the “*regional campuses*” daily processes is crucial to identifying hindering elements that prevent them from improving practices. To bridge these shattered

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“*central*” and “*regional*” (as in *non-central*) if our intentions and efforts are towards “decentralizing” and “homologating” different components of an institution. To follow the underlying aspiration of bridging actions among different communities in given locations, we should promote the use of reflected concepts able to enhance negotiation channels that strive for equality, change and openness.

parts, joint action is necessary, where stakeholders and members are immersed in their specific contexts together with all different communities close to their reality, this in order to establish a context-rich negotiation. Such consensus is likewise needed for other differing debates, where contrasting study fields gather to negotiate an object of interest.<sup>121</sup>

Now, it has been stated as well that to study the *space of learning*, this thesis frames the phenomenon in *times of digital media*. Among all relevant perspectives, space is highlighted in relation to *computing devices* in the educational place, hence embracing tension that exists between *digital media*, where the general is always present in a never ending process in contrast to *universities*, where disciplines stand for specificities. Outside and inside. Learning by wandering or learning by schooling. But to acquire a better understanding of it, the Universidad de Costa Rica was taken as a case study, and for it we must review some Costa Rican historical foundations up to its current state.

### 5.1.1. Costa Rica, some historical hints of relevance

It must be noted that different to the current scenario, the Costa-Rican reality was not the same during the 1980s. Apart from its stable political conditions in Central America at the time, the country has been traditionally promoted as suitable for the attraction of foreign investment and the education of specialists; but also blessed with favourable government policies that may have directed this state away from a history afflicted by violence, war, great economic inequality, and low access to technology. Costa Rica and Panama, conversely, have stood out as exceptions in the area, in the middle of a region that seems to lag behind still.

Central America has a weak platform for productive innovation, research, applied research and technology transfer on ICT. A symptom of this problem is the very low quantity of centers focused on the above areas. (Universidad de Costa Rica, Cámara Costarricense de Tecnologías de Información y Comunicación and Federación de

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<sup>121</sup> A good example in this sense has to do with the *curricular management and training of secondary education teachers*, initiatives that to adopt a new model as their current state creates disagreement, nested as part of the *Secondary Teacher Training School* within the Education Faculty (Amador Salazar, 2015). There, high school teachers are trained in shared responsibility with other study programs that at the same time belong to different faculties at UCR. According to many, this framework is obsolete to administrate study programs in participative action. For this reason, two proposals were confronted while keeping different positions: on the one hand, one proposal fosters reconsidering the nature among shared majors (changing even their names) in order to fairly distribute the participation quota throughout disciplines involved and to grant them altering administration for each of the programs, but on the other hand there remains a more conservative attempt, conceiving the administration of all the programs still within the *Secondary Teacher Training School*, thus optimizing the administrative system through centralized coordination assisted by other schools.

Asociaciones de Latinoamérica, el Caribe y España de Entidades de Tecnologías de la Información 2008, 11).

According to The Global Information Technology Report 2012 (World Economic Forum and INSEAD 2012, 124), Panama and Costa Rica evidenced a positive condition in comparison to Central American countries. In both cases, they constitute the best scenarios throughout the region in the sense of being available and prepared to adopt information technologies, something they call “stages of digitization”: constrained, emerging, transitional, and advanced. Panama and Costa Rica are positioned in the emerging digitization stage as shown in *Table 05*, leaving neighboring countries far behind in the table among the nations in the constrained stage. Moreover, in the case of Costa Rica, the rate of basic skills of its population is praised and, at the same time, associated to the current good educational level system. Notwithstanding, it also points out gaps such as the lack of infrastructure in available ICTs, as it hinders the possibility of developing in general conditions.

The Global Information Technology Report 2011 also included, as part of its analysis, four exemplary case studies of regions that receive special recognition for their development behavior. In this occasion, the selected cases were Costa Rica, Saudi Arabia, the United States, and the European Union (Villalobos and Monge-González 2011, 119). Among the criteria listed for this designation, the chapter emphasizes Costa Rica’s national strategy in favour of the technological sector, and more directly what is related to public investment in education in combination with ICT’s. But as stated on page 179, this tendency of global reach has become a common criteria for universities. As Barnett points out, this phenomenon is illustrated with “the appearance of global rankings of universities” (Barnett 2010, 52). In this case development indicators are clearly associated with the noteworthiness of standards in post medial times.

Costa Rica is known because of decisions at political, cultural, and economic levels that have undoubtedly determined the course of events. Possibly, one of the achievements of major resonance inside and outside the borders, was the abolition of the Costa Rican army on December 1, 1948. This is a symbolic event that bears a special significance in the culture of this Central American nation. The message could be interpreted that instead of aggression, social mobility and education are the appropriate tools to unify efforts and think of a joined project.

Constrained		Emerging	Transitional	Advanced
Ethiopia	Morocco	Georgia	Jordan	Lithuania
Comoros	Honduras	Bosnia and Herzegovina	Seychelles	New Zealand
Niger	Kyrgyzstan	Ecuador	Barbados	Slovenia
Burkina Faso	Bolivia	China	Mexico	Belarus
Madagascar	Sri Lanka	Armenia	Turkey	Hungary
Afghanistan	Moldova	Trinidad and Tobago	Montenegro	Poland
Lesotho	Aruba	Botswana	Colombia	Greece
Mali	Namibia	Antigua and Barbuda	Bahrain	United Arab Emirates
Rwanda	Guatemala	Azerbaijan	Philippines	Slovak Republic
Yemen	Dominican Republic	Panama	Iran, Islamic Republic	Romania
Togo	Suriname	Venezuela	Macao SAR	Russia
Cameroon	Pakistan	Albania	Serbia	Czech Republic
Mozambique	Paraguay	Saint Lucia	Argentina	Netherlands
Sao Tome and Principe	El Salvador	Macedonia FYR	Oman	Ireland
Benin	Gabon	Peru	Uruguay	Italy
Burundi	Fiji	Brazil	Latvia	Spain
Lao PDR	Egypt	Costa Rica	Croatia	Austria
Senegal	India	Mongolia	Bulgaria	Germany
Djibouti	Belize	Lebanon	Cyprus	Portugal
Cuba	South Africa		Ukraine	France
Nepal	Guyana		Estonia	Singapore
Iraq	Kazakhstan		Kuwait	Belgium
Uganda	Algeria		Malta	Australia
Uzbekistan	Thailand		Qatar	Finland
Kenya	Tunisia		Saudi Arabia	Sweden
Vanuatu	Brunei Darussalam		Mauritius	United Kingdom
Swaziland	Indonesia		Malaysia	Japan
Côte d'Ivoire			Chile	Denmark
Vietnam				Israel
Bangladesh				Canada
Cambodia				Taiwan, China
Nigeria				Luxembourg
Zambia				United States
Ghana				Switzerland
Syria				Hong Kong SAR
Angola				Korea, Rep.
Cape Verde				Iceland
Bhutan				Norway

Table 05. Countries according to their stage of digitization (World Economic Forum and INSEAD 2012, 124)

During the same decade of voices and decisions, in 1940, the University of Costa Rica was officially founded based on the legacy left by the first higher education institution in the country -Universidad de Santo Tomás- in 1843. With an acknowledged humanistic, critical, and social view, it was committed to “contributing to the changes that society requires in achieving the common good, by means of a policy aimed at social justice, equality, comprehensive development, full freedom, and total independence for our people” (Article 3, Organic Statute of the University of Costa Rica, *own translation*). This sequence of events can be seen as a story of achievements and can be understood as the foundation of a project aiming for social transformation. The debate that rises out of education in times of digital media is one such, for it is in the light of challenges and social needs that these platforms should be considered as opportunities to find new options and to build bridges in *the outside* of our routines and nations.



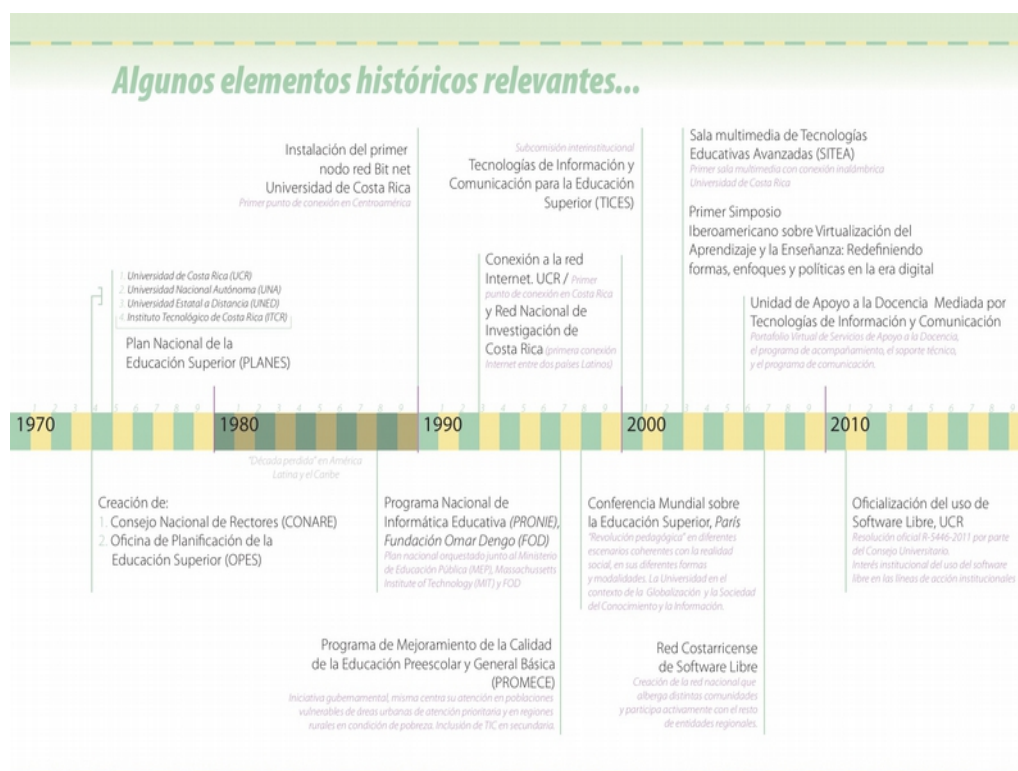


Fig. 14. Timeline with relevant events in formal education, Costa Rica

These events in 1948 occurred after an action of regional consensus, identified as one of the cornerstones of education history in Latin American. During that year, the General Secretary of the Central American University Superior Council (CSU-CA, its acronym in Spanish) was established, an entity created with the clear aim of integrating and strengthening Higher Education in Central America. It should be noted that in the decade of the 1940s, it was extremely important to prepare an ideal setting, one able to function as a general framework for complementary actions to be developed in the region and national territory.

On the other hand within Costa Rican society, a number of dependencies and initiatives (Fig. 14) relevant to the education sector emerged. Each of these instances meant a new milestone for the acknowledgement of technology, thus the importance of digital media in education. A project able to illustrate the link between education and computers appeared in 1985, when government offices opened the first computer laboratory at the Bachiller Osejo Educational Center. It favoured the implementation of a Network of Educational Computing Centers (CIE, its acronym in Spanish) in high schools (PROSIC, 2007).

Later in 1987, the National Educational Informatics Program (PRONIE, its acronym in Spanish) was created, developed by the Ministry of Public Education (MEP, its acronym in Spanish), the Massachusetts Institute of Technology (MIT), and the Omar Dengo Foundation (FOD, its acronym in Spanish). This was a pioneering project in Latin America, where joint effort fostered the importance of getting to know the bare computer (see p.182), as described by Turkle. The juncture with MEP ensured coverage in localized sectors of the country; and different primary schools pertaining to the program were provided with a computer laboratory, where students and educators spent time on a weekly basis. In addition, a plan with supporting lines at different levels was fundamental, especially for educators. According to Alvarez, M. et al.:

Costa Rica pioneered the introduction of computers in primary schools in Latin America. Its program, which was launched in 1987, was designed as a total system underpinned by constructivist pedagogy and the Logo programming language. Its goal has been to contribute to the transformation of Costa Rican education through changes in teaching and learning that are brought about by the use of computers, the training of teachers, and the excitement generated by children's self directed learning, knowledge creation and problem solving (Alvarez et al. 1998).

By 1993, a new initiative took place: the Universidad de Costa Rica became the first connection node to the Internet in the country. The project<sup>122</sup> began with the interest of academics, convinced of the necessity to be part of this young network that would favour academic and investigating works based on the relationship established with different institutions and universities around the world.

Their vision enabled two important actions: to establish the National Research Network of Costa Rica (where other similar research-related institutions gained access to the network), and to develop the first connection to the Internet between Latin American countries: Costa Rica, Nicaragua, Panamá, among others. The correlating element was again the backbone of actions related to the technology sector.

For its part, the Costa Rican government continued with new program development to complement the initial effort made with PRONIE and extended to vulnerable, rural, high school populations. Therefore, the Program of Improvement of the Quality of Preschool and Basic Education (PROMECE, its acronym in Spanish) was initiated in 1987. In this regard, the 2007 PROSIC report states:

“The Educational Innovation Program provided non-traditional environments and

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122 This project is explained in the document “Interconexión de Costa Rica a las Grandes Redes de Investigación Binet e Internet” (Interconnection from Costa Rica to the Major Networks of Binet and Internet Investigation) (de Téramond, 1994), which was written by one of the professors involved in the management team of this initiative.

innovative learning rooms with mobile and fixed technologies to 72 educational institutions. This included computers, learning aids, software of diverse applications, such as MicroWorlds Ex, Create Together, Geometer's Sketchpad, Macromedia, MS-Office 2000 and 2003, Publisher, Access and Project, CMAP Tools, Encarta Encyclopedia, McAfee Antivirus, and Worthy Composer" (PROSIC 2007, 197).

A year later, the World Conference on Higher Education was held in Paris. It was a milestone in terms of technological inclusion, as it promoted discussions of the "pedagogical revolution", heeding the importance of settings and encouraging consistency of discourse of universities and technologies with each social reality. At that time, *The University in the Context of Globalization and the Society of Knowledge and Information* was discussed. Nevertheless, it seems that the impact achieved in terms of national accomplishments appears largely with instrumental aspects and institutional equipment, including the acquisition of software as reported in the 2007 PROSIC Report.

A clear example is the creation of the inter-institutional subcommittee of Information and Communication Technologies for Higher Education (TICES, its acronym in Spanish), in charge of promoting excellence in the ITs discussion that takes part among associated universities. According to the (Programa Estado de la Nación 2011, 195), the report submitted by TICES indicates that "[...] in recent years, a major boost to technological infrastructure has been developed through computer equipment, complete platforms, networks, specialized personnel and other resources." Therefore, I find it fundamental to step back to gain perspective about a pedagogical revolution, and ask whether our current scenario matches that discussion held years ago.

In the presence of these arguments, various sectors in Costa Rica have reported a lack of clarity in certain processes concerning higher education in times of digital media. Hernández among them, indicates that in spite of the explicit importance of ICTs in higher education, a strategic plan to materialize the principles of institutional programs related to the ICTs was not found in any public university (Hernández 2006, 12).

Others accentuate aspects of research to visualize programs and technological apparatuses in accordance with their impact on socio-cultural and economical contexts on affected communities (Ferrer and Madriz 2009, 28). In their case, they see this awareness as fundamental to properly evaluating improvements and problems caused by media within educational environments, and to plan formative projects in favour of teaching personnel and their use of IT in everyday practices.

Other challenges were criticized in another important report on Costa Rica's Education that expressed in its third annual edition that due to the information limitations of private institutions of

higher education, it was not possible to know the use of ICTs within that sector (State of the Nation Program 2011, 195). The same absence has been claimed by researchers within UCR, who noted the lack of systematized information to feed their research initiatives. Because of this, one of them acknowledges constrained results that prevented him from portraying a wider collection of programs and projects in the country (PROSIC 2007, 187).

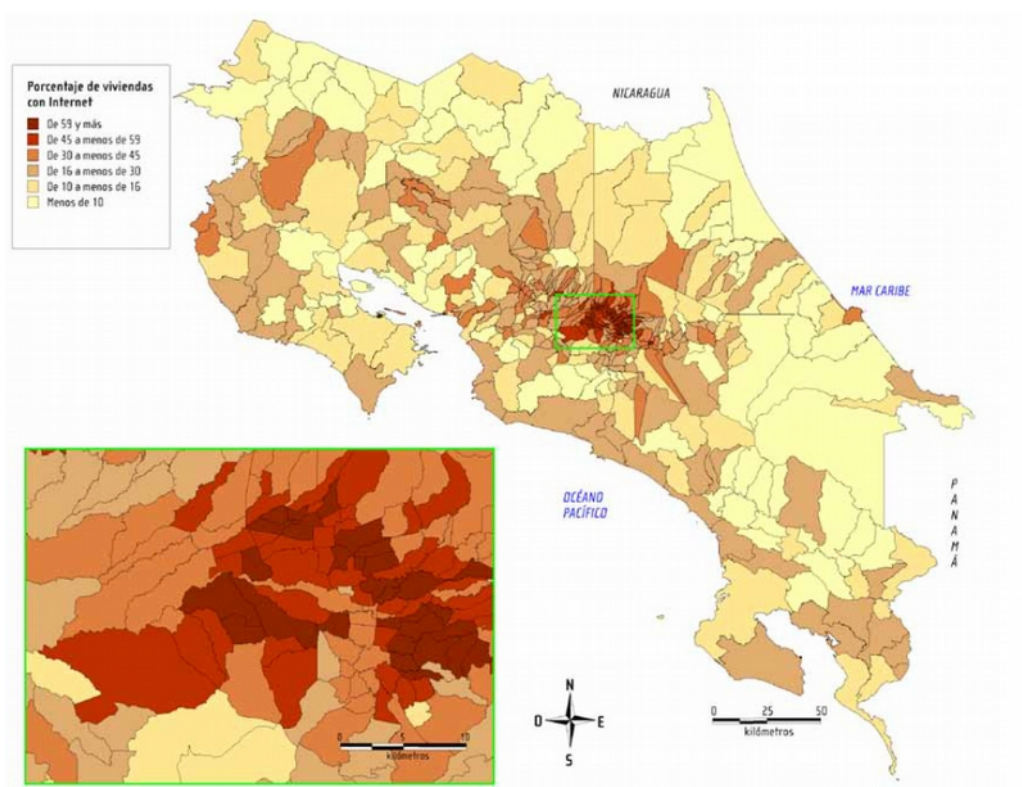


Fig. 15. Houses with Internet access throughout different regions in Costa Rica. (INEC 2012,126)

Finally, in the García et al. (2008) diagnostic, they study the management and implementation of ICTs at The Universidad de Costa Rica, and among their findings, they emphasize an interesting “wake-up call that arises from some people that found other barriers to developing ICTs: the absence of a clear philosophy about this subject; the unequal distribution of equipment among the different areas and fields of knowledge at the University of Costa Rica; and the fact that many of these projects have been registered without budgetary support, prompting the necessity to create a policy that prioritizes the development of the ICTs” (García et al. 2008, 13 *own translation*).<sup>123</sup>

123 “Una llamada de atención interesante surge de algunas personas que ubicaron otros obstáculos para el desarrollo de las

While studying further these sources, it seems that a consensus in terminology has not been reached. On top of that, the 2012 reports of the National Institute of Statistics and Census (INEC, its acronym in Spanish) regarding Internet access in Costa Rica, show that this country presents great disparities between regions and numbers of inhabitants connected to the Internet.

In the final section of their report, García et. al (2008) propose three different and possible scenarios that the Universidad de Costa Rica could assume in accordance with ICTs to improve education promoted within the institution. While it seems that several of these suggestions were implemented at various university places, they remain isolated efforts in many cases.

Considering again these three scenarios, a first recommended scenario was entitled “*Capacitación de profesores/profesoras, funcionarios y alumnos en la filosofía, el paradigma y los usos de las TICs*” (Training in Philosophy, Paradigm and Uses of the ICTs for Professors, Employees, and Students). In that section, the authors point out the necessity to balance diverse university activities with digital media. To this end, they clarify the necessity to establish policies with a projective view, “a process of awareness and training in philosophy, paradigm and uses of the ITCs for the university community” (García, Marín, and Viales 2008, 52).

The authors consider “Blended Learning” as the second scenario. For them, spaces as virtual campuses should be reconsidered not as a centralized figure, but as a way to create transitory spaces before using this input. An aforementioned option is the use of collaborative web pages between several educators (García et. al 2008, 53). Another characteristic mentioned above is related to the professor-student relationship, typically drawn up within a schedule, and commonly held in a physical location. The scenario contemplates the possibility of expanding that relationship to a virtual framework that allows communication through different strategies such as electronic mail, forums, among others.

On the other hand, García et al. (2008, 54) state that “the management pertinent to ICTs seems to move towards five different spheres”, identified as follows: 1) virtualization of academic units, 2) virtualization between branch campuses and other university premises (and a possible model of integration with other state universities), 3) relationship between the UCR and other external entities, 4) university with the students, and 5) university and citizens in general. In these authors’ case, I like to interpret this stance as the importance granted to the idea of conceiving a university classroom as a house, with doors and windows connecting freely to the outside. In such terms, it is indicated as vital to

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TICs: la falta de una filosofía clara sobre esta materia; la inequidad de la distribución de los equipos entre las diferentes áreas y campos del saber representados en la Universidad de Costa Rica y el hecho de que muchos proyectos sobre esta materia se han inscrito sin apoyo presupuestario, lo que recuerda la necesidad de generar una política que priorice el desarrollo de las TICs. Sobre algunos de estos aspectos también profundizamos en otras partes de este estudio.”

go beyond the discussion of fragmented areas and continue defining a relationship between higher education and digital media as a tool.

A third case-scenario is presented: “the definition of the stages and scopes of virtualization”. This aspect focuses on the apparent incompatibility that exists between the management of virtualization processes and inclusion of ICTs, as well as the management of criteria and conceptualization to understand the different stages that a process like this represents in a humanistic institution. Here, the complexity of the challenge entails logistic, administrative, and structural dimensions that are characterized by a lack of conceptual clarity and grounded opinion on digital media and its institutional relationship.

Interestingly, the aforesaid document proposes one final section in addition to the three case scenarios previously reviewed. It reads as One Last Recommendation: The Construction of Socio-Technical Networks at the University of Costa Rica, which recommends thinking of “the need to create a space for deliberation on ICTs, the creation of materials, and the development of basic guidelines that facilitate the development of a virtualization project is noted” (García et al. 2008, 57 *own translation*).<sup>124</sup> Seven years later, it seems that this suggestion remains valid.

## CHAPTER 5.2. FIELDWORK DATA / SCRAPBOOK OF A JOURNEY

According to Creswell, there are some key characteristics for conducting an ethnographic research, which in terms of this work are identifiable in terms of the chosen structure I use to delve into the subject.

A cultural theme refers to a common viewpoint which is known or implied, openly promoted in a society or group. In this research, the space of learning at a university is presented as the topic of interest. Secondly, when adopting ethnographic studies it's helpful to declare what is known about a culture-sharing group, relevant because it allows us to explore not only the general position to be found in the cultural theme, but also to inquire into the specifics of a given context by identifying a site, a group within it and among them, to gather data. In this case, this research is concentrated on active members of different courses at UCR who shared particular behaviours, beliefs and language (Creswell 2011, 469).

A third element regarded by Creswell, considers the shared pattern of behaviour, belief and language. In these terms, one looks for certain social interactions that seem common in groups, and emerge as tacit rules and expectations (Creswell 2011, 470). In this thesis, my attention remains close

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<sup>124</sup> No obstante, se percibe la necesidad de crear un espacio para la reflexión de las TICs, la creación de materiales y el desarrollo de lineamientos básicos para crear un proyecto de virtualización.

to the study of the relation of students and teachers as members of formal spaces within education, always keeping in mind that both share a context in times of digital media. Complementarily, I inquire about their beliefs about the approach of learning within the structure of university. For this, my research strategy aims to delve into the presence of contrasting patterns between “what should occur” and “what did occur”, this by observing and approaching teachers and students in their roles inside places for learning at university, their expectations and their concept of what learning implicates.

To inquire further into this issue, a fieldwork phase is necessary to develop closer contact with educational structures like those at the University of Costa Rica. This element is fundamental in light of my theoretical position for it underscores the importance of the experienced space as a necessary factor to create a kind of knowledge that aspires to the “whole” around any human enterprise. All the same, this stance is inspired by the analysis of other researchers who consider ethnographical approaches fundamental to the idea of space, as “mapping and documenting the physical space of the schools and observing patterns of use and interaction” and becomes a valuable instrument for investigating educational structures (McGregor 2003, 356).

Fieldwork in this research extended for 11 weeks. During this time, data of a different kind was collected at the University of Costa Rica from March to May 2014. To truly prepare, the process started in January 2014 to fulfill all the formal requirements of a qualitative design (see Creswell, 2011, 240). Because of its complex organization, permission to access educational spaces and to conduct fieldwork at the University of Costa Rica is granted by different boards affiliated to each faculty. Based on this condition, my first step was to identify those courses of interest and their respective gatekeepers. It is important, however, to emphasize that the focus of my data collection wasn't about picking communities in the light of their specific contents. While courses were selected from different study programs, this didn't conform to my interest in some disciplines in detriment of others, but simply my intention to be careful and include a variety of fields and audiences in the research design.

Ultimately, my interest was to explore perspectives among various sharing cultures throughout classrooms at the University of Costa Rica, hence bringing to the foreground the idea of space which is drawn in formal structures. Moreover, I paid greater attention to this subject by avoiding gender indications among interviewees, thus concentrating on the concurrent opinions of students as humans immersed in formal education. This decision wasn't complicated since regardless of their gender or level in their different disciplines, most participants seemed to agree on similar learning aspects that are intimately linked to the concept of experienced space.

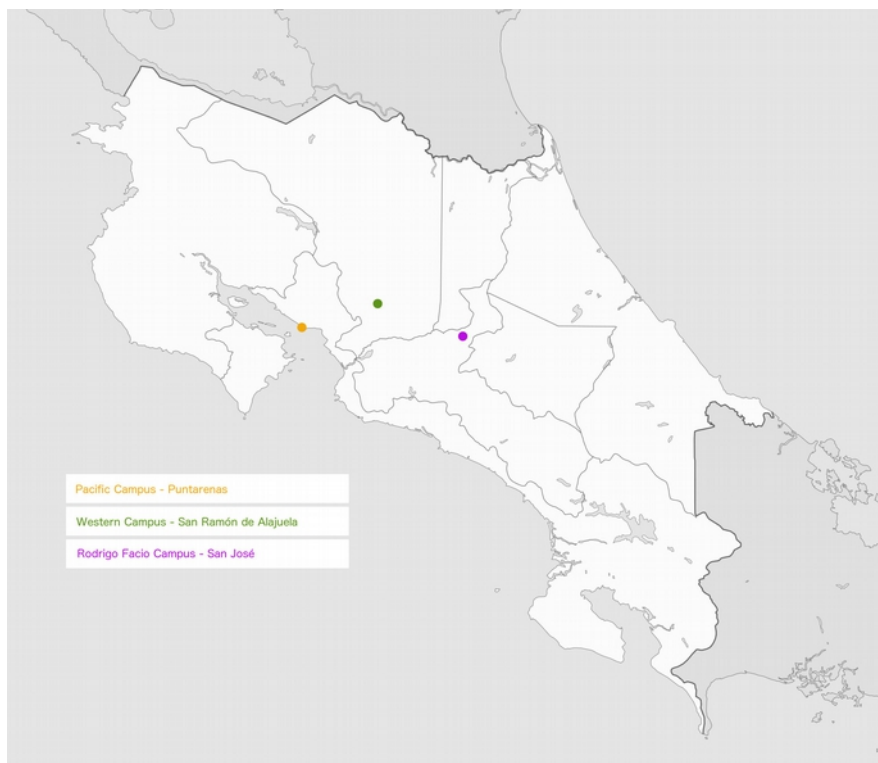


Fig.16. Location of each Campus within the country.

In addition to access to courses, my criterion for choosing certain locations was constrained by the academic offerings available at three different campuses (Fig.16.)<sup>125</sup>Based on this I chose courses on different levels<sup>126</sup>, with convenient weekly meetings, and proper scheduling in order to attend at least three sessions of each class. To remain flexible, I decided to rent a place in each region and thus be able to collect data about students and professors in their everyday possibilities.

The first establishment visited was the Pacific Campus in Puntarenas, in one of Costa Rica's harbour cities, 100 kms away from the capital. "Founded in 1975, [...] this campus is an important development factor for this fishing region, [...] housing an average of 939 students" (UCR, 2015). The second was the Western Campus in San Ramon de Alajuela, 51 kms away from Puntarenas at a higher elevation. "It was founded in April 1968 and is the most developed regional campus of the University

<sup>125</sup> Study programs aren't equally available on each of the campuses of the University of Costa Rica. Depending on the region, a wider or narrower offering of courses is defined each semester. It emerges complementary to the context of the campus and its location in the country, economic practices of the region, job opportunities, curricular plan among other reasons. The semester guide containing active courses was accessed online, at the official university website.

<sup>126</sup> Based on this, (3) first year classes, (2) intermediate courses and (3) advanced courses are part of the sample for this research



of Costa Rica. It houses over 2820 students” (UCR, 2015). Finally, a last visit centered on the Rodrigo Facio Campus, the largest institutional establishment in the capital with more than 30,000 students. In Fig. 17, I offer some extra details about the courses attended during my fieldwork, the number of individuals in each course and the time dedicated to each campus.



Fig.17. Studied courses during my fieldwork phase, I Semester 2014. Universidad de Costa Rica.

At all times, institutional protocols necessary for conducting research were defined. A formal request letter was written to the institutional authorities directly responsible for granting access. My approach remained always open and transparent to the university campus director or to the study program coordinator in order to share details about the reasons for my study, my interest in the Universidad de Costa Rica and the possible uses of collected data. Each authority responded positively to my request. After obtaining permission to continue, I contacted each teacher responsible for the selected courses to introduce myself and my study, asking for permission to take part in their class.

Once granted permission, my ethnographic design was implemented in each of the courses. It included some participative observation sessions, a questionnaire and interviews with students and professors. In terms of *emic data*, recorded interviews were taken to illustrate quotes and expressions typically “used by members in a cultural sharing group” (Creswell 2011, 471). *Etic data* is interpreted with the confrontation of learning by schooling and learning by wandering structures used to present different findings. Lastly, *negotiation data* comes with the permission granted by each consulted instance, thus offering the researcher access to private and public spaces associated with their learning.

Assisted by these elements, the ethnographer is able to construct a description, aiming for comprehensive characterization of a given culture-sharing structure. As Creswell (2011, 472) says,

“This description needs to be detailed and thick, and it needs to identify specifics. It serves to place the reader figuratively in the setting, to transport the reader to the actual scene, to make it real”.

For me, this approach integrates the fundamental characteristics in humans, as they get to know the outside world through their experiential interface. This becomes helpful in order to tackle the diversity of perspectives found in the thematic data analysis, which responds to some of the conflicts encountered between students and teachers at the University of Costa Rica with relation to their idea of learning and the formal idea of education. The topics relevant to understanding the educational strategy schema presented (see p.208) appear as a larger case study able to unveil basic characteristics in terms of the (a) space of learning, (b) the student’s role, (c) the teacher’s role and (c) the role of digital media within the classroom. In the presence of these topics, an ethnographic interpretation is fundamental in order to illustrate the contradictions that prevail in educational contexts at the University of Costa Rica.

Finally, ethnographic research is always aware of the context that “surrounds the cultural group being studied” (Creswell 2011, 473). In this thesis, I include different research actions to approach as closely as possible the context in examination. In this case, instruments like participant observation were chosen, thus getting oneself involved in the educational settings under study. As explained by Brugnoli (2005, 323) with this stance one is able to collect information in a flexible way, either openly and without structured programs (non-structured observation) or making use of observation cards as a resource to assist the researcher organize notes and the results of observation.

For this research, non-structured observation was implemented to observe behaviours and interactions of participants, inside and outside the dynamics of the formal structure of their classes in classrooms. This was complemented with structured observation, as it was helpful to observe certain behaviours related to the location of students and their uses of digital media during a class.

It is important to highlight once again, that reflection on ethnography appears as a product of an individual and interpretative process in the light of the trajectory and cultural background of myself as researcher. Unavoidably, the sequence of actions during the fieldwork phase at the University of Costa Rica was enriched by prior experience as part of the teaching personnel at UCR. This being so, I agree entirely with Creswell in terms of the outcome of ethnographic approaches,

Being reflexive also means that authors’ conclusions are often tentative or inconclusive, leading to new questions. The study might end with questions that beg for answers or multiple perspectives or viewpoints for the reader to consider (Creswell 2011, 474).

### 5.2.1. Methodology

To follow the order of actions implemented during my field study, it is useful to consider Spradley's Developmental Research Sequence (Creswell 2011, 476). Among different types of ethnographies, the case study was adequate for this thesis since its frame allowed me to explore in depth the object of study at the Universidad de Costa Rica. According to this type of design, the ethnographer centers attention on individuals, who in terms of my investigation are members within the formal structure of a university classroom. In the case study, the phenomenon is "bound to" or "separated out for research" (Creswell 2011, 465) based on a distinctive characteristic, here introduced in terms of space.

In relation to the purposeful sampling plan, it must be indicated that my choice of collecting data is understood in the sense of maximal variation sampling. This is because of the importance I find in explaining the landscape of perspectives on a problem, hence to consider it in its complex structure. In this sense, setting aside that all consulted courses, students and professors were of differing characteristics, they shared concurrent opinions and similar characteristic on the importance of space in the educational design. In order to carry out this endeavour, Creswell suggests making use of appropriate data-collection procedures, attempting to "collect as many types of data as possible to develop this understanding" (Creswell 2011, 477). In my case, this attempt is undertaken with observations, interviews, questionnaires, documents and photographs. More precisely, each of these strategies took place as follows:

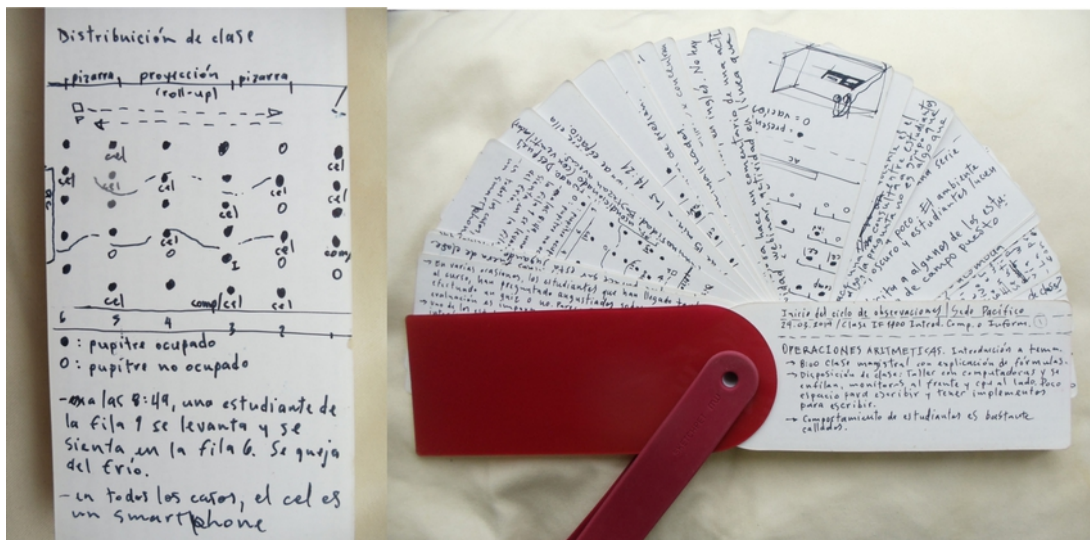


Fig. 18. Sketchpad used to record information during the participant observation stage, and location-based schema of participants with digital media usage during a class.

*1) Participant observation.*

To access each of the courses selected, I addressed each teacher in charge. During a short meeting, I first offered them an overview while explaining the intention and interest of this research in relation to their classes. Once the background was presented, I explained my research instruments and the reason for each. Part of the request indicated the extensions this would entail, considering whether the professors made it possible or not to join him or her in possible spaces that are meaningful for the educational process, located outside University structures.

Once granted permission in each of the different sites, 20 sessions were recorded according to the semester calendar of each campus. In order to keep a basic structure, an observation card (*see Annex 02*) was defined to organize the following information: date, starting time of the class, number of participants during each session, highlights of the relation between professor and students during the class, and a location schema to indicate the position of each student while the class took place and the location of digital media in the classroom.

To initiate observation, in each of the attended courses I was allowed to introduce myself. I explained who I was, my condition as a doctoral student and my affiliation to the Universidad de Costa Rica. Most important, I emphasized to the students that I was there to take part in the class, in all discussions and exercises like any of them. Right after the presentation, my role as a participant observer allowed me to integrate into activities while recording relevant field notes on my observation card (Fig. 18).

*2) Questionnaires.*

During the last session of observation, a questionnaire (*see Annex 03*) was applied to each group. This instrument was designed to obtain a complementary view to the sequence of observations, where questions provided information relevant to thematic data analysis. Overall, it aimed to explore generalities among students and teachers in each of the selected settings. Making use of a mixture of close-ended and open-ended questions as Creswell mentions (Creswell 2011, 220), certain interrogations were designed to broaden my exploration of space.

This invitation to open up was also made with the kind of items used for the questionnaire, complementing Likert scales with some extended matching questions and schemas in order to foster students' answers through a ludic exercise. As seen in Fig. 18, this aspect was successful not only because it allowed students to give unexpected information relevant to my analysis, but also because it was refreshing for them during the application of the instrument in class, as several students told me. Nonetheless, other answers permitted me to contemplate more closely the conditions of digital media in students' and teachers' everyday life, not only outside the university but also in the classroom.

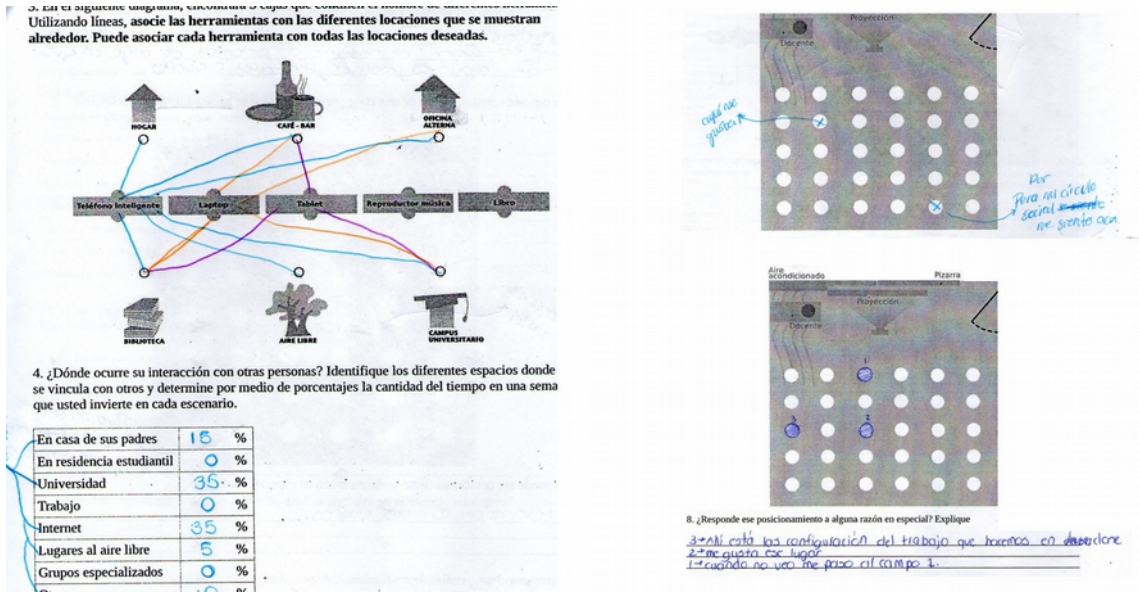


Fig. 19. Appropriation of items in questionnaires by some students of University of Costa Rica. (see Annex 04)

### 3) One-on-one interviews.

To inquire deeper a third layer was established by means of conducting interviews. With them, a more detailed type of information allowed me to illustrate evidence encountered during the observation phase and the recorded answers in questionnaires. In total, 24 interviews were made with teachers and students who were members of the selected classes during my fieldwork. Each guide contained 16 questions that aimed not to find facts, but to understand contexts and necessities of humans within the educational structure. Again, topics related to the space of learning, digital media in the classroom and student and teacher profiles were of importance and for them, different questions were established.

To identify the interviewees, participant observation sessions became fundamental. After spotting some students inside every studied classroom, two or three individuals were usually contacted during the last observation session for each of their courses.

Originally, the approach to participants was going to be through an explanation letter, containing a formal request to conduct an interview. However, once on site, it became clear that the best way to proceed was to avoid as much as possible any hierarchical distances in using official means of communication. In this sense, this research acknowledged a different level of interaction in the cultural framework existing at the Universidad de Costa Rica. Either informally during class breaks or at the

end of the course, I spoke with students who represented contrasting cases: on the one hand, an individual who demonstrated frequent use of digital media throughout class activities, on the other hand, someone concentrated exclusively on the teacher, without active use of digital media

After an affirmative answer, I proceeded to ask for their email to write them later the same day. Only two students did not respond; the rest agreed to a later meeting. In all cases, interviews took place on each campus, one-on-one. To proceed with each interviewee, I read out loud an informed-consent form, and according to the terms there indicated (among them anonymous participation), both of us proceeded to sign the document. Each interview was documented by audio recorder to allow more dynamic interaction between us. Each interview was then analyzed and quotes relevant to the theme analysis and thesis concepts were transcribed.

#### *4) Documents; audiovisual materials.*

Immersed in a time-consuming research process such as a doctoral project, my condition as a researcher studying an event that manifests in a particular manner and which depends heavily on a setting away from the lively experience of the interpreter's everyday, soon becomes a significant challenge. For this, documents become fundamental references, as they "can include newspapers, minutes of meetings, personal journals, and letters" (Creswell 2011, 223). For this thesis, a number of public documents published by the University of Costa Rica and others in the country were fundamental, for these sources kept me updated on the latest discussions, critical positions and the appearance of new politics that could have a possible impact on the educational configuration of university structures.

Against all recommendations, I continued to read and follow relevant publications during my doctoral research. This probably had an important impact if we think of the liquid scenario for which our generation is known when computers have surpassed the number of human beings on earth. Was this beneficial for the sake of my results?

Some documents are of special importance for my analysis. One includes motions and projects presented at the VII University Congress in 2014. From this I selected a series of documents that offer meaningful information, relevant to my argument and provide background for an overview of the official consensus at the University of Costa Rica and may represent debates and organizational efforts about institutional development.

Furthermore, audiovisual resources also provided me with support for the elaboration of my argument. In addition to the mentioned instruments, photographs (during my fieldwork in Costa Rica) and online videos (documentaries, for example) allowed me to complement my analysis of basic

concepts presented with contextual setups to further shape results in this manuscript. Explained by Creswell (2011, 224) “images provide an opportunity for participants to share directly their perceptions of reality. Images such as videotapes and films, for example, provide extensive data about real life as people visualize it”.

Finally, to analyze and interpret the data, the case study was a viable design for producing a rich description. But in order to organize the categories relevant to my main topic, I made use of a categories structure (Table 06), based on my previous discussion of learning by schooling and learning by wandering as two approaches to educational strategy. My intention has consistently been the consolidation of a solid description in reference to the Universidad de Costa Rica, paying attention to its diverse character.

### **5.2.2. The Space of Learning at the Universidad de Costa Rica in Times of Digital Media: the case study.**

Once the particular features for proceeding with my fieldwork were settled, I began to collect data on the Universidad de Costa Rica, the case study to complement this research. Following Brugnoli's (2005) suggestions, one of the advantages to conducting anthropological research (using a combination of observation, interview and questionnaires) is that information can be collected beyond memory and beyond the perspective of the interviewee. One avoids a certain amount of noise by directly experiencing scenarios.

Moreover, as a participant observer, a researcher is able to enrich the information gathered from interviews and questionnaires, because observation implies “considering (and collecting data on) individuals as actors and integrated components in their social environments” (Brugnoli 2005, 322). Thinking about this possibility, my agenda was based initially on open terms, aiming to get involved as much as possible in the university processes at each of the venues available. Although my questions and approach were by that time defined, I didn't limit my experiences in reference to the various instruments elaborated; instead I attempted to explore these sites seeking interaction with different members and at related events.

Some two years since my last visit, the infrastructure of these campuses hasn't changed. Remaining highly contextual to the socio-economic regions they belong to, these UCR academic communities are very different from each other. On the Pacific Campus, for example, the UCR establishment is open to individuals who inhabit the Central-Pacific region, a poorly inhabited area with a high percentage of poverty and in need of mobility media to assist humans.

	Learning by schooling / Research Categories	Observation	Questionnaire [students (s.qt) teachers (t.qt)]	interviews [students (s.iv) teachers (t.iv)]	Documents, audiovisual material
Space of learning	<u>Teaching intention:</u> control, expected outcomes, standards, functionality. <u>Didactic strategy:</u> fixed, centralized actions, homeliness/Fremd , time, high-semioticity. <u>Context:</u> inside/outside. <u>Theoretical foundation:</u> decontextualized knowledge, multi/inter/trans-disciplinary.	Starting time of the class. Location schema to indicate the location of students while the class takes place.	Learning spaces in the everyday life. [question s.qt: 5, 6, 7, 8]	Learning spaces in the everyday life. [question s.iv: 8, 9, 10, question t.iv: 10, 12, 13] Context importance in classroom. [question 15; question t.iv: 7, 9]	Teacher, audios: 003,004,006,007,010,011,013,021,023,023b,025,027,028,029,031,032,034,036,039,040,041. Student, audios: 046,047,049,050,051,054,055
Digital media within the classroom	<u>Techniques &amp; Teaching and Learning activities:</u> didactic strategy, prior experiences, evaluation, hot-transparent medium, timetable.	Location schema to indicate the location of digital media while the class takes place.	Uses and proficiency of digital media/class. [question s.qt: 9, 10, 11, 12; question t.qt: 4, 5, 6, 7] Pervasiveness of mediums. [question 3]	Relevance and uses of digital media. [question 5, 6(t.iv)]	Teacher, audios: 002,015,016,017,018,026,033,038. Student, audios: 045,
Teacher / Student roles	<u>Learner's role:</u> cognitive development, user, unenlightened, many-one, to be shaped. <u>Educator's role:</u> importance, professor, contents expert, orchestrator, user, changes student's perspectives.	Highlights of the relation between professor and students during a class,	Uses and proficiency of digital media/pers. [questions 1, 2] Spaces for socialization. [question s.qt: 4]	Spaces for socialization. [question 1, 7(s.iv), 11(t.iv)] Motivation and expectation. [question s.iv: 11, 12; question t.iv: 8] On formal education. [question 16; question s.iv: 6, 13, 14, question t.iv: 14]	Teacher, audios: 001,005,008,009,012,014,019,020,022,024,030,035,037,042,043. Student, audios: 044,046,048,052,053,

Table 06. Structure with categories of relevance for the ethnographic study: the Universidad de Costa Rica study-case.

Puntarenas is a region with few job resources (Instituto Nacional de Estadística y Censos 2013, 20). These conditions can be experienced by exploring the campus, surrounded by empty land, abandoned factories and old houses that seem highly deteriorated (Fig. 20). Furthermore, this campus is two blocks away from the Pacific Ocean, a place where high temperatures are experienced in summer and



muddy, flooded conditions during rainy season.

Different geographic and economic dimensions are experienced at the Western and Rodrigo Facio campuses, as they both belong to the central region of Costa Rica, an area reported to offer more optimistic indicators for life in the country, taking into consideration employment, development gap and impoverishment severity (Instituto Nacional de Estadística y Censos 2013, 20). Both campuses are settled in urban areas with milder temperatures at over 1000 m. elevation.



Fig.20. Surroundings and environment of the Pacific Campus.

One of the advantages I experienced as a researcher was that I was familiar with each campus from the past. Teachers I already knew there were helpful contacts for my orientation. Having shared some trajectories and experiences in the past was an important factor for casual conversations with participants who considered me part of their communities of practice and provided me with relevant information. This feature allowed me to access spaces on the Pacific Campus. It was valuable since it is a limited-size community that appears to be susceptible to foreign individuals without shared affiliations to the Universidad de Costa Rica. For instance, one of the professors helped me settle my accommodation arrangements during the month and a half spent in the town of Puntarenas.

Some of the teachers at Pacific and Western campuses were also very friendly, asking me to join them in sports activities or to share lunch and coffee while extending our talks. Often during the day, I would simply attend any of their few communal spaces, where students and teachers came together during their breaks, chatting with each other, working, being a community of known faces. During this spacious time, meals were accompanied with rich, detailed conversations. In a rather loose style, crucial institutional themes were covered, and professional expectations directly connected to university life and work were also mentioned. In the middle of various perspectives, these spaces offered relevant ideas about teaching, community challenges, institutional contexts and education philosophy implemented in the educational designs at the Universidad de Costa Rica.

Different from these, the larger Rodrigo Facio Campus introduced distinct circumstances. Categorized as a “university city” (*ciudad universitaria*), the architectural complex and the large student body contrast with conditions found on the Western and Pacific campuses. Perhaps this is what fosters the apparent detached relations between some academy members. In San Pedro de Montes de Oca, conviviality between teachers and their students was not like that in Puntarenas or San Ramon. Their weekly schedules seemed to be more crowded and scattered around different locations.

Nevertheless, as far as my official requests were concerned, all of the addressed participants reacted positively to my fieldwork design. Some teachers were enthusiastic and curious to hear more and take part in upcoming discussions on the results. Their openness and willingness was keen at times. They even considered the possibility of further joint work if possible, to improve their educational designs.

Furthermore, each of the visited classrooms at the Universidad de Costa Rica presented an educational space constructed in the light of the *learning by schooling* approach, where teachers and students are distinguished by their roles, according to an educational structure regulated by interconnected bureaucratic instances.

Consistent with previous discussions, all observed teachers are professionals trained in disciplinary backgrounds unrelated to education. Either active in or retired from their professional activities, these educators are experienced professionals in their respective fields, an element they consider a determining factor in their role as teachers.

Their commitment to teaching seems to originate from an inner conviction, as most of these educators said. Their motivation for carrying out educational endeavours is determined by numerous reasons, but for them, it is not primarily based on training as educators. For *Teacher Cyan*, teaching is an opportunity to change something that has been a source of frustration. For this professional, since his student days until now, high development in university teaching does not exist:

“Well, to be honest, I have seen poor development, and one of the reasons I became a teacher, *-obviously there is always an economic motive in between-*, was because all my life as a student [...] I had only two teachers who were the way I wanted them to be

*(pause)*

“so, all my academic life, I lived frustrated *(speaking slowly)* because of this, a part of my style, when I am teaching, that is why I do,

*(pause)*

“what I wanted them to do, when I received classes as a student. I feel that it has not advanced much, with all due respect [...], universities are full of dinosaurs, this, and the majority of people teaching are individuals too structured, with no street [smarts], and that is not what people like to hear.”

*Teacher Cyan, 47 years old*

In class for instance, this prior experience is commonly used to approach students in different ways. Teacher Blue was one of them, sharing personal experiences that emerged spontaneously during class, in line with discussions with students. This approach seemed to interest some of them in the classroom, as they actively participated. However, a significant number still continued talking and paying no attention. Interviewed about this condition, Teacher Blue confessed there is a need to be taught how to do research and how to be a better teacher, as educators don't know how to conduct these processes:

“I am not a teacher nor professor by profession but by conviction, right? And because ... they place us in this teaching place, to teach in a class, and it is very easy for me to make myself understood, so what happens? The pedagogic part, I am lost here because I have never studied pedagogy, I never took anything related to that.”

*Teacher Blue, 49 years old*

During interviews or in casual conversations on campus, most of these educators expressly referred to students as individuals to be shaped, human beings different from them, living an academic moment unlike the educational scenario they faced as students. Very often, they mentioned digital media as a central element associated with this condition and, in the case of Teacher White, considered advantageous for students. However, he was sceptical of the consequences digital media could have on the space of learning:

“Now, they all have a computer at home, all come with a laptop to classes, before you couldn't do that ...*(pauses)*

“so, I don't know if that makes you value things more, to care about things more than now. I feel that students are now lazier, they come, let's say

*(pauses and reflects)*

“as a colleague once told me,

“a student came, and she was missing some points. She said, ‘Teacher why don't we do it like when I was in high school; you give me some extra points and I will give you a broom and mop away?!’

*(reacts bothered)[...]*

**“So, I feel that they come with those bad structures from high school, and they are coming now like this, so, one's role is to motivate them ... so that they want to see more, to shine in the things that they are doing”.**

*Teacher White, 34 years*

Relevant to this, students at the Universidad de Costa Rica in times of digital media make regular use of computing machines in their everyday life. According to their questionnaire answers, more than three-quarters use mobile telephones very frequently, followed by smartphones and laptops, in contrast to other devices they never use such as e-readers, scanners or gaming consoles.

However, devices such as smartphones and computers aren't precisely the ones they know better, something evidenced by their status as users (see p.228). In that case, they reported having advanced knowledge of machines such as TVs, mobile phones and radios, which are technologies they don't report using as often (with the exception of the mobile telephone).

On the other hand, there is a match between those devices they do not use with those machines they reported not to know about. Complementary in terms of their everyday life, students were asked about their preferred software applications. Questionnaire results showed that students at the Universidad de Costa Rica make frequent use of Internet browsers, e-mail and instant messaging (IM) or social networks, services that matched their answers stating an advanced level of knowledge about such services (with the exception of Internet browsers).

Moreover, it is revealing to know that just like the students, teachers at the Universidad de Costa Rica in times of digital media are closely related to technology. Answering the same questions as students, all of these professionals use laptops and smartphones very frequently, whereas in comparison, only half of them used radio, TV and tablets as frequently. In contrast to their students, almost all teachers considered themselves advanced in relation to smartphones, but knew nothing about e-readers and phablets.

To complete the scenario, educators were also asked about their uses and knowledge of software applications. Just like students, they indicated that in their everyday life almost all of them make frequent use of Internet browsers and e-mail. Teachers assured that their knowledge was advanced in terms of e-mail, but only half of them declared themselves advanced when it came to Internet browsers, social networks and IMs.

During interviews, it was noticed that each educator's private context had an impact on their membership in UCR in different ways. Among them, half weren't fully dedicated to teaching at the Universidad de Costa Rica, because either they were full-time professionals in their fields, or because their affiliation to UCR was limited to a provisional contract. While being interviewed, they evidenced

some level of uncertainty about ways to improve their condition, both professionally and personally, as there was “no time” to do this.

For instance, in Teacher Blue’s case, this condition pushed him into being an itinerant educator. Dedicated full-time to UCR, his workload was divided among three different UCR campuses, a role that he admitted was “tiring”, but highly enjoyed by this professional. It was clear for Teacher Blue, however, that this wandering format as educator isn’t for everyone, but for people with life styles close to this person’s reality: single, flexible and fully dedicated to it. Later during the interview, this educator recognized that this uncertainty creates an important challenge in many cases. Thinking of other colleagues, Teacher Blue recognized a lack of commitment among them, calculating that at least 90% of them worked outside the institution. Referring to them as “desk teachers”, Teacher Blue maintains that for many of them this is only a side-job they have:

**“... I also ask for opportunities, to access spaces, to get more assignments, but those things do not happen. I have been working for 10 years, since 2002, and I am still provisional. I asked for full time in the UCR but I haven't made it.**

**“They always give me two (courses), and two part time. Why? Because others are arriving, lots of young students that must be given (*correcting words*), that want to be teachers and have to get classes assigned to them.**

**“They are giving them the opportunity but at the same time they are losing all that one knows”.**

*Teacher Blue, 49 years.*

Other situations were observed, where the private context of an educator affected the space of learning experienced by students in a class. In the Cyan Course for instance, regardless of the official schedule, more than once this educator faced complications getting to the university on time, this while trying to cope with responsibilities and distances between multiple job locations in addition to UCR. In the meantime, outside the classroom, a bunch of students waited patiently, despite the uncertainty of the educator’s arrival. The first time, after almost half an hour of delay, Teacher Cyan rushed in, justifying the situation. “Traffic jams and no parking place available” were his excuses. However, one week later this happened again. On this occasion, Teacher Cyan chose to phone me directly, explaining the difficulties in finding a parking space. He then proposed I make use of the class time by asking the students to fill out my questionnaire until he arrived.

For most students, the hierarchical difference between them and their teacher within the space of learning at the Universidad de Costa Rica was clear. Indifferent to each of their own private contexts, they seemed to pay more attention on how to fulfil their teacher’s regulations throughout their educational designs. Nevertheless, the relevance of having a “one-one” approach educator instead of a “many-one” was often observed and proposed during interviews. Katsumi Grass discussed this during

an interview:

**"I feel that it is very important, let's say, or it would be very important, for teachers to interact lots with one, on a personal level. I don't mean, let's say, to generate confidence or lack respect, but there is a more human relationship. That makes one feel much more supported, more confident about asking questions. Nobody is exempt from personal issues. So, if you have the trust, you will tell the teacher 'I broke up with my boyfriend'. I don't know ...I don't feel... or any type of situation that one could suffer".**

*Katsumi Grass, 22 years old*

It was noticed that those teachers who seemed to be popular among students had a conciliatory tone during class, being kind and playful during certain moments. Educators like Teacher White likes an educational structure with certain flexibility, spacious enough to consider and adapt to emergent situations, like the time many students were delayed coming to class because of problems related to public transportation and traveling distances. Some of these teachers as good performers, use casual vocabulary and address students with a certain sense of humor, creating some accessibility to converse with them. Students mentioned such characteristics and were clearly able to distinguish key elements in favour of environments that would enhance good communication platforms. Taylor Azure from the Blue Course, expressed the importance of spaces of learning where the teacher is driven by a humanistic approach in the design of his classroom:

**"... the human side because there are teachers that get immersed into teaching their lesson but they forget that one is a human being, and that it is not like you are going to go to an office to lock yourself in to make a mechanic lifetime job."**

*Taylor Azure, 20 years*

Other students were also eager to describe a conflicting image of what they expected a friendly teacher to be: empathetic to his audience, ready to recognize and include other participants in a community of practice. Darcy Amarelo in the Yellow Course concentrated on a negative image:

**"(...) those where a teacher arrives and begins to write, and places his body like this, in front of the board, and you can't see anything, and he speaks, but he does it for himself, nothing more, he doesn't pay attention to the students. And suddenly, he asks 'did you understand?' So, as one does not understand anything, I am not going to say 'I don't understand anything', I am not going to say that because, then you have to say 'yes, yes, yes .. we understood'. But one did not understand anything. That is a bad course, when a teacher just explains for himself".**

*Darcy Amarelo, 21 years old*

This attitude of familiarity was evidenced once again in the case of Teacher White, who instead of the distance between teacher and student, prefers to approach students casually. In the Green Course

for instance, during one of the sessions students remained passive without taking part or behaving actively. However, as soon as the class was over, although it was lunch time, a group of them stayed talking with the educator, without making academic requests or asking questions relevant to the course (Fig.21). It went beyond the classroom boundaries, into the everyday action of the outside, where the space of learning acquires a wider possibility. In this case, Teacher White describes the trustful environment that he is able to develop with certain students:

“Already those in second year are like, ‘Prof, how is it going?’ Then a kiss and a hug followed by ‘when do we get out?’ For instance, last year with some kids they were like, ‘let’s go eat, Prof!?’ Let’s go for ice cream, or let’s go have a coffee.’ In this way one interacts more with them. (...)

“Sometimes one comes to trust each other so much that it’s like, ‘Teacher, may I use your phone?!’

“There you go.

“And they take it and ‘Oh wow, Prof, what’s up with these photos!?’ [laughs] What a mess! Come on, stop looking!

“And then: ‘Teacher, let me play with the phone! Teacher, is that?’ ... take it, call ... And it doesn’t bother me”.

*Teacher White, 34 years*



Fig.21. Students and teacher activity after class.

As has been pointed out, both students and teachers observed at the Universidad de Costa Rica during my fieldwork were major users of digital media. Among different options, their predilection was

for communication systems such as mobile phones, laptops, or software applications like e-mail, IM and social networking that were very frequently used. Smartphones were the most popular.

The popularity of smartphones wasn't only limited to their use, but according to their answers (*Annex 3, question 3*) smartphones were clearly the most pervasive machines in students' and educators' everyday locations. It was shown that for students, they used it the most at home, followed by at coffee/bars and on campus. However, it is important to emphasize that after smartphones, books were preferred (slightly) over laptops or computers in their everyday locations. With regard to educators, they used smartphones the most at home and at coffee/bars, and at the uni-library. Similar to students, teachers said that the second most pervasive medium were books, once again slightly more than laptops or tablets, for example.

Not in vain, it was observed that smartphone technologies were often mentioned by participants during one-on-one interviews, but they were also observed as objects actively in use during classes at the Universidad de Costa Rica. I also want to suggest their potential as boundary objects (see p.146) for they play a role in terms of mediating not only digital information, but also physical interaction between participants as demonstrated by Teacher White.

According to the importance highlighted in the questionnaires, during most of the courses I attended, students used their mobile phones very often, primarily for instant messaging (IM) or short message systems (SMS). Some did this discretely; others did it quite obviously during class. Often, this was not even necessary because along with their notebooks and other tools, students kept their devices in plain view. In fact, during one of the sessions of the White Course, the teacher used his personal smartphone while students worked on an exercise. This behaviour seemed to increase in larger groups, as was the case in the Green Course, or whenever learners looked tired, or even unobserved by their teacher.

Students used digital media in various ways. Without being asked to, some learners supported their educational tasks by using their smartphones to take pictures of the whiteboard or of their notes. Also and quite often, digital media emerged in classrooms as soon as activities didn't demand the students' complete attention. They tended to take out their smartphones during group work: tasks where "reading" was involved, or individual analysis had to be written in their notebooks. One such situation occurred during an explanation by Teacher Yellow in front of the class. One student began watching a football match on his computer. Once discovered by the educator, he was required to turn off the device.

For an overview, students and teachers in their spaces of learning at the Universidad de Costa Rica were questioned about their use of devices during class. Following the tendency earlier mentioned



about their everyday technologies, nearly half of all learners reported using a smartphone during class as their first choice. More rarely, less than one-quarter of these students reported using personal computers, music players or tablets. Teachers on the other hand, used video-projectors often, this being the most common device used during a class. This machine was followed by the use of personal computers and for half of them the use of smartphones.

I personally verified this during my participant observations, where almost all educators made use of video-projectors as a vital element around which their class took place. Differently, almost all of the classes observed didn't make use of smartphones to fulfil any formal task, with the exception of the Magenta Course for example, where the meaning of a word wasn't clear. Without hesitation, Teacher Magenta asked the students to look for the meaning of the content on their smartphones while reminding them that they were more skilled at using such devices.

Some other technologies were also considered. Teacher Blue for instance, alternated activities when students seemed to be exhausted from discussing a class topic. In their setting, computers with Internet connection were welcome for undertaking the suggested exercise. Trusting that learners were equipped with computing machines, Teacher Blue seemed to spontaneously propose the idea, asking students to form groups and discuss a given activity. Computers or smartphones appeared to be of the utmost relevance in order to manage the exercise.

Participants were also asked (on the questionnaire) about why they used digital media during class. They answered that the main reason was because of a task given during the lesson. Considering that the space of learning at the Universidad de Costa Rica is constructed without formally including the use of smartphones (the device that students use the most during a class) it may be suggested that learners take it upon themselves to use these machines perform certain tasks during a lesson.

In addition, it is relevant to note that as their second main reason, almost half of these students asserted that they use digital media to access social networks. Learners also provided other explanations indicating reasons such as social life, downloading videos, making extra progress in other assignments, personal motives or emergencies, messages, illustrations or just being distracted/bored. Some students reinforced their message by adding some non-required information (*see Annex 04*). On the other hand, answers from teachers demonstrated that their main reason for using digital media in class was related to class activities.

The pervasiveness of smartphones was confirmed in the course of observation sessions in all visited courses and campuses. It was typical to see scenes like the one during one of White Course's breaks, where at least half the students remained close to the classroom door, waiting for Teacher White to continue the lesson. They sat next to each other, remained silent, each using a smartphone.

Most of the interviewed teachers acknowledged the prominence of smartphones and social networks among their students. Some of them, highly in favour of digital media talked about their efforts to include them as part of their didactic strategies. Teacher Blue, for instance, recognized that despite the fact that social networks aren't a positive element within the classroom, they become helpful once the session is over. In fact, this educator expressed the need for institutional regulations prohibiting the use of social network applications and smartphones inside the classroom, which for him foster distraction during class. However, outside the classroom, digital media that could assist communication processes between them, became a fundamental tool for Teacher Blue:

**"I am '24/7' with my students. They are always going to find me. Saturday, Sunday, 3am. I live for them".**  
*Teacher Blue, 49 years.*

Consistent with this view of digital media as counterproductive in a classroom, a challenging situation occurred during one of the courses. Although Teacher Green was active and empathetic with all the learners, at one point he became irritated with three students sitting in the back. While he explained one of the class topics on the whiteboard, these students talked loudly in the middle of his presentation. The educator, clearly annoyed, invited them to leave the classroom if they had no interest in taking part in the lesson. The rest of the class reacted mockingly, witnessing the scene and staring at each other. The reprimanded students smiled nervously and looked down, while checking their smartphones. This time, they remained quiet. One of them, who seemed older, changed his attitude and began to participate more frequently.

In the tense atmosphere that seemed to emerge after the conflict, this educator moved on and continued the program making use of a projector and a computer. The students listened and observed quietly, following Teacher Green's indications. However, at some point one of the reprimanded students interrupted the educator by raising his hand and breaking the silence to warn about a display on the presentation that showed that only 7% of the computer's battery was left. The educator turned the machine off and asked how to proceed. The computer was then taken to a corner where it was plugged in to re-charge its battery.

Once more Teacher Green continued, preferring this time to use a marker to write on the whiteboard. Notable uneasiness emerged soon after, which eventually triggered into a growing murmur. Without noticing and already in the middle of his explanations, he had left the video projector on and a strong blue light was projected on the front of the class. This made it impossible for the students to follow Teacher Green's gestures or read what was being written. Ignoring this, the lecturer continued and created a stressful moment for the students, who now hesitated on how to approach the

situation. Once again, one of the reprimanded learners raised his hand, this time asking for the projector to be turned off in order to see better. Teacher Green then asked the student for help because there was no remote control and the device was out of reach. The student replied that the projector was unreachable for him too, grinning slightly as he said this. This episode may be taken as an example of the relation between educators and students within the classroom, where membership within them as a community of practice isn't solely driven in terms of control and power granted by the institutional structure, but also mediated by the mastery of participants (see p.225), indifferent to their role in class.

Furthermore, it was observed that media in the space of learning isn't just a functional tool, but can also disrupt the educational structure with aesthetic and symbolic standards (see p.44). When asked about the state of higher education, the opinion of Teacher Cyan was quite clear. This educator said that several colleagues were "dinosaurs", missing "street" experience, people who preferred to remain glued to paper usage, afraid of digital media. Assessing such tools on a symbolic standard, this educator said that the lectures offered by these teachers were mostly boring, nothing a student wanted to hear. Therefore, it was preferable for Teacher Cyan to be transparent and reachable, to share with students all kinds of online community identities, e-mail and telephone as something normal, for instance:

**"I am zero paper use... There are professionals here at UCR who love to go with their cars loaded with papers. I hate papers. I hate them!"**  
*Teacher Cyan, 47 years old*

Moreover, some mentioned the use of institutional online platforms at the Universidad de Costa Rica, one specifically known as "Mediación Virtual"<sup>127</sup>. While some of the students and teachers identified this software as "functional" because of the ability to deposit files and/or presentations, other criticisms emerged. In the case of Teacher White, there were a series of challenges in association with this service, and for that, social networks offered a better way to remain in contact with students in the White Course. However, in this case one feature was important to most of the interviewed teachers. They expressly encouraged the use of digital media to offer students any possible way to be in touch,

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<sup>127</sup> Mediación Virtual is an educational platform offered at UCR to assist teachers and their courses with different online features. It is a Learning Content Management System (LCMS) hosted in the institution and administrated by a dependency called METICS, dedicated to promoting "formative spaces for the academic community at UCR, apt to improve and transform the educative processes with innovation within teaching mediation. [...] This effort is done largely focusing attention on TICs." (METICS, 2015 *own translation*)

(METICS se ocupa de generar espacios formativos para la comunidad académica que les permita el mejoramiento y transformación de los procesos educativos al innovar en la mediación docente con un enfoque de aprendizaje colaborativo que promueva la interactividad y la interacción a través de la incorporación de las TICs.)

but always with a hidden agenda: to undermine any possible excuse not to perform according to the regulations of the class:

“The problem is that this platform is often inaccessible. There are issues, you can't see. It is very ugly; there are many things not right. Nevertheless, it does the job, that is, stores information for the students. What happens? Most students sign in. So, since I was already friends with some of them on Facebook, I decided to go for it, since sometimes they ask me questions there, so I said to myself, look at this! So, at some point, the second-year kiddies asked, ‘why don't you open a group on Facebook?’ Right, so I created a closed group, just for us, and there I keep posting stuff like, ‘remember I uploaded this material onto the platform! Remember that there will be a short test on Monday!’ And they ask me, ‘what are the topics for the test?’ And I answer and we communicate this way. (...)”

*Teacher White, 34 years*

Participants were also questioned about their preferences in terms of applications and online services during a class. According to the questionnaire, students were consistent with their everyday tendencies: they reported very frequent use of instant messaging services and e-mail services as their first option, followed by social networking or specialized databases. On the other hand, they declared no use of weblogs, cloud storage or cloud-based platforms, followed by educational platforms like *Mediación Virtual*, a trend that matched the tendency found within their everyday practices.

Teachers' answers were similar. As their questionnaire results evidenced, during a lesson they used online video platforms often. They also pointed out that specialized databases were frequently used. They did not use educational platforms or cloud-based services as often, and they never made use of social networking. However, as soon as the class is over, this behaviour changed and it was recognized by some like Teacher Blue, that services such as Facebook were helpful, specially because these sorts of platforms allowed monitoring:

“They know that if they are on Facebook they have to be aware of everything. That is the first thing I refer to in a class. You mention Facebook, then you have to be aware of everything. Because you must press the "Like" button not just for a singer, but also for the financial newspaper. I make a list with all the ministries and I indicate that they are going to give a 'Like' to all of them”.

*Teacher Blue, 49 years.*

Teacher Green made an effort to bring digital media into the traditional classroom when he asked students for a physical meeting in order to “open WhatsApp”, showing his interest in enabling a group chat with some students by using an instant message application installed on each of their smartphones.

Some other educational structures tolerated equally the use of technology in class. In the middle of an explanation in the White Course for instance, one student's mobile phone rang. Unbothered,

Teacher White continued leading the class despite the interruption, or perhaps because the call was briefly answered by the student. However, this same attitude was embraced by the educator, who later on received a phone call while teaching, excused himself and answered it outside the room.

Another scenario occurred in each session of the Pink Course, where digital media was often used. Either by projecting carefully selected videos to the class, or by using bluetooth technology with students to share information, this teacher was enthusiastic about trying new things. Teacher Pink said that mobile applications like Whatsapp were useful in teaching. He said they respond promptly whenever there is doubt or the necessity to consult certain professionals who could clarify information for the class.

Students seemed aware of such efforts (or lack of them) in educational structures in favour of exploration processes like the ones portrayed by teachers Green, White and Pink. However, it was observed in various interviews that digital media alone made no difference in how these students felt their educators proceeded with their didactic strategies. When asked about the importance of digital media for the space of learning, students and educators had slight differences of opinion: all the professors agreed that digital media was very important for the space of learning; however, in the case of students, close to one-quarter of them found digital media as only moderately important. Some of them indicated that digital media was normal, but not important to their spaces of learning.

To round up this information, students and educators were asked to mention fundamental tools for their educational processes, where for the first time their position towards smartphones changed: significantly less than one-quarter of them mentioned that such devices were fundamental to their educational process. Instead, they ranked computer and laptop as the most important tools, followed by books and the Internet:

**“Sometimes I feel that all the teachers, like, they should be more creative. At times it seems to be not enough for them to come and make a presentation in PowerPoint. Present it, and that is it!?! And that was the class! Because, when they are like this, like similar to this, they lose my attention, almost completely.”**  
*Taylor Azure, 20 years*

Moreover, in spite of these initiatives to adopt digital media as a part of their educational structures at the Universidad de Costa Rica, some students seemed cautious every time they used their smartphones and computers, among others. In the White Course for example, some of those learners who behaved rather quietly and distant during class, in certain informal spaces on campus or during breaks approached me, speaking in an open, curious way, interested in hearing again about my research. After my answer, they joked about my possible goal: an act of surveillance to later “blow the whistle” on the amount of time they logged into Facebook during class, implicitly aware of this as an

action forbidden in class; conscious that it was not welcome there.

Indeed, during my observations I witnessed some students, who hidden from the teacher's sight, made sporadic use of digital media, mainly smartphones. This procedure to use hidden digital media was identified as a regular event. This kind of action could also pertain to alternative media usage. For example, during one of the sessions in the Magenta Course a student took out a music player and sneakily put on an earplug. He proceeded to work while listening to music. The learner carefully stored the device inside his pocket so as not to be caught by the educator while in class.

Returning to Teacher Blue, he clearly stated that social networks played an important function in the kind of design constructed by him as they provided the ability to remain closer with students and ex-students. It was also important because the context of the students expanded for this educator, as getting to know about their private life could have an impact on how to treat each student as an individual:

**"I know they are young, they are going through this whole situation, complicated, for some of them, I see people who are very good, others are good but are falling behind. Because of delicate situations, I can see that they stay up late, or that maybe they drink alcohol, things like that. So, all of that is part of their context, so; I try. Like now, there is a little guy who is always late and arrives asleep, so I began asking him questions, because he is very smart, but I know he has a problem, I think it is a serious problem, I don't know the issue profoundly but it seems that way. But these things concern me. However, how far can the university interfere in such situations?"**

*Teacher Blue, 49 years old*

The space of learning at the Universidad de Costa Rica is contained within a traditional computer laboratory, provided with workstations organized in strict rows, where each table's surface is occupied with a monitor, a desktop tower, a keyboard and a mouse. While most of the time these desktop computers remain switched off, the traditional arrangement not only limits student's vision around the classroom in order to interact with each other, but it also doesn't allow learners to work properly with other instruments like notebooks. This condition becomes problematic more than once, every time a lesson plan doesn't integrate any use of computers to complete exercises. Nevertheless, educational actions are contained in this environment (Fig.22).

In other traditional places, the distribution and mobility of students is conditioned by traditional desks formed in rows, where each student has to sit one after the other, facing the front where a teacher has a designated desk, different from the students'. In this distribution and depending on the size of the place, interaction between students is always challenging, a setup highly dependent on the teacher's performance, which occasionally exhausts some educators.



Fig.22. Space of learning within a traditional computer laboratory.

Reaffirming the importance of our experiential interface, the Pink Course portrayed the importance of contextual elements in detriment of educational designs at the university. The space of learning in this case was a challenge because of the climate conditions having an impact on every participant. Right after lunch, students had to go into a closed room without proper lighting or good ventilation. Provided with only three roof fans, teachers and students had no choice but to conduct their actions under negative characteristics in terms of light conditions, surrounding noise and tiredness.

Visibly affected, attention and concentration were significantly diminished during the run of their meetings where Teacher Pink was among the most affected, trying to orchestrate interesting activities to help students in their educational processes despite the terrible conditions. Making use of two instruments, questionnaires and observation sessions, students were asked about their seat preferences in each of their classrooms, and the motive for their choice. More than three-quarters of the students revealed more than one preferred location within the classroom. According to their answers, the most common reason for their favourite location was related to 'feeling comfortable', followed by 'better view or hearing' and lastly, because of 'being used to it'. Some students said it depended on where their friends were, or to be able pay attention and not be distracted, among others.

Be that as it may, the space of learning and its arrangements at the Universidad de Costa Rica was controlled by the educator. In some of these classrooms, for instance, educators like Teacher Yellow would approach students right at the beginning of class, asking them to relocate to the front as most of them were sitting in the back. Teacher Magenta did the same during a session. Challenged by a group of students who were not able to keep quiet, the educator compared them to “kindergarten” pupils. Teacher Magenta then split them up in the classroom, finding in this physical separation a practical solution to the problem.

The educational structure for learning seemed to be a design in benefit of the educator’s needs and sometimes schedules. Normally, each of the spaces started with a lecture, when contents were explained by the teacher. In the case of the Green Course, their shared space of learning took place during the afternoon. Students were often tired after one hour of concentration on a lecture. Teacher Green perceived this and would interrupt the analysis. To gain their attention, some reminders about evaluation (tests) were made, more exactly a clarification about the procedures on how to deliver a pending project for the class: an assignment to complete at home, and to be returned on a specific day up until 23:59. Teacher Green reminded them to be careful not to send their answer after 00:00, as the email system shows precisely the time of each operation.

Throughout the educational configurations visited, it came to be clear that the space of learning at UCR is limited to a design that obeys an approach of learning by schooling, shaped and administrated by a teacher, a figure that matches closely the role described by Laurillard. Under this premise, it was found that in most classes, evaluation was the most effective element among their didactic strategies.

During several observations, I was able to notice that those students arriving late worriedly asked other classmates if they had missed any short evaluation. In this sense, evaluation strategies at the Universidad de Costa Rica appeared often as a threatening or punishing instrument in the classroom, an element that provided educators the ability to convince learners to pay attention, complete tasks or meet schedules.

Either planned or unexpected, different types of examinations were encountered. A planned exam, for instance, was announced in the White Course more than a week before. This triggered some nervous reactions among students, who otherwise were traditionally quiet in the classroom. From the moment of the announcement to the actual exam day, students periodically raised questions related to the upcoming evaluation. They usually inquired about the contents to be covered for the test, the number of questions, and the kind of exercises they were supposed to practice to be prepared. Teacher White always responded conscientiously to their questions, at times making jokes, yet keeping an enigmatic tone, careful not to reveal too many details about possible problems to be included.



In other moments when students were not concentrating, a reminder about an upcoming test effectively recaptured their attention. Students reacted nervously as soon as the topic was mentioned in class. The day of the exam, they were requested to clear their work stations in order to leave only a pen or pencil. Teacher White handed out a test paper to each student and then watched the students, from the back, out of their eyesight.

Unexpected examinations (“pop quizzes”) were also an object of attention. The possibility of these evaluations was announced at the beginning of the course, when students were given all the details about the criteria for their final grade.

In this scenario, when a teacher chooses to give a pop quiz at any given moment during a random class, the result obtained is part of an overall plan. Unexpected evaluations are an elementary part of Teacher Cyan’s educational structure. One time the session began with a surprise test, which was only one question spoken aloud by the educator. For this test, the students had to write down their ideas. The atmosphere turned tense, and the students looked nervous. In this way, Teacher Cyan used an educational structure of absolute control and histrionic performance. Students listen and obey, reacting to some level of pressure, being requested to answer.

In general, attention to evaluative processes (tests) was noticeable. This is an element of special interest for students in the space of learning they experience at the university. In one of their gatherings for instance, Teacher Magenta decided to announce the outcome of the latest exam. After telling everyone their results and offering some feedback, students appeared to stop paying attention, and their interest decreased significantly. Facing this situation, Teacher Magenta attempted different strategies to get their concentration back, and presented a new home assignment along with a new exercise to analyze during the current session. However, learner’s interest remained affected, some still reviewing their tests. More than once, Teacher Magenta was forced to repeat instructions to different students. Being asked for a fourth time about the same topic, Teacher Magenta got upset and complained. Students didn’t seem to like this, however, they laughed in a nervous way.

On other occasions during the development of most of the courses, participants were unable to maintain interest and pay attention. Depending on the activity some bored reactions were evidenced. Either not participating, not paying attention or not concentrating, bored learners weren’t naturally engaged at this point. When this occurred, some teachers tried to include them more actively, asking them to freely participate in the course of the class, however, as soon as students resisted any required tasks, educators reacted with threatening remarks, fully conscious of the tiredness or boredom among pupils. Challenged by one such scenarios, Teacher White declared to all students, “I know that you don’t like it when I choose who goes in front of the whiteboard, for this it would be better if one of you

decided to go in front now, voluntarily”.

During one-on-one interviews, several teachers display their awareness of their limited conditions in order to design the space of learning at UCR. In each of their conversations, they made some reference to the inside and the outside of their courses or their fields. For Teacher Yellow, the use of examples in class that originated from current experiences during a full-time job this person was in charge of, every week, was noticeable. These examples seemed to assist various discussion between educator and students, however, some of them -mostly sitting in the back of the class- remained indifferent and detached from the event under discussed by Teacher Yellow. Nevertheless, this effort to connect the outside and the inside by assuming an approach of learning by schooling, seemed to discourage some students, as Dominique Lemony explained later on. She talked about the reason why the classroom is not the place where learning happens:

-Would you identify the classroom as the place where your educational process happens?

-No.

-Why not?

-Because normally, when I'm in the classroom, I'm already distracted, or something like that.

-What do you do in the classroom then?

-(makes a pause and thinks about it) Well, sometimes I pay attention but to be honest, this seldom happens.

-Is your process distinct?

-Yes, let's see. I can go and listen to the class, you know, to a teacher. Sure, sometimes there are things that are interesting and one pays attention. But generally, when lectures are too long or something, one does not pay attention. It is known that there are books about it, or the presentation file or whatever being handed out by the educator; and well, at home or even here at university, we (students) gather and read together. Each of us reads one part of a text and later on, we get together and discuss what we have read. I pay more attention to classmates than to teachers, truth be told.

*Dominique Lemony - 21 years old.*

In Dominique's testimony, it is possible to notice a relation between this student's notion of learning, and the social realm being shared with other classmates, that is, beyond the space of learning delimited by Teacher Yellow. Seeing that learning has been presented in this thesis -among its different characteristics- as a social phenomenon (see p.106), I took it as relevant to find out whether student's social locations had some correspondence with their idea of space of learning. In their answers, students said that the place they socialized the most was at university, followed by their parents' house, Internet and lastly, outdoors.

When confronted with the question about their ideal space of learning, students were pretty clear: almost three-quarters of them identified home to be that space, preferable in silence (more than half of

the students), and divided equally about times of day: some mentioned morning, others afternoon and an equal number during the night. Some students added other conditions for their ideal space of learning: food and drinks available, music, and Internet were again mentioned.

During interviews and informal conversations with students, almost all of the learners I approached were clear about their role as students belonging to an institution, agreeing that it extended further, beyond their classrooms. However, it is interesting that next to this asseveration, they associated this extension of their role in direct connection with concepts such as exams, studying again their weekly classwork to clarify concepts, or to complete homework.

With relation to their student status, different points of view were presented. For example, Adrian Crimson (23 years old), was clear that their role as learners overstepped their schedules and classrooms, despite “one has to carry on alone, as the university isn’t telling one what to do. For this, one has to think what to do. [...] and there should be university support”.

Nevertheless, it must be highlighted that this extended condition of learners beyond their schedules and classrooms, seemed to be related not to their awareness or willingness to be part of learning events everywhere, beyond university, but because of the demanded formality they were supposed to meet when immersed in educational configurations that matched a learning by schooling approach. In this sense, this structure of extension of duties was directly bound to their notion of time like “semester” and “free time”:

*Researcher- And how does it work then, if you aren't taken any more courses, once the term is over?*

*Leslie- ehh no. I disengage completely.*

*Researcher- (...) so do you consider you learn then, in the meantime?*

*Leslie- [long pause, doubting] No, what I really do is rest, rest as much as I can, and well, I don't feel like I learn then, maybe a bit of French but to be honest, I am not really into reading (...)*

*Researcher- Which are the characteristics of this topic, I mean, learning languages, that makes it not as difficult as it is to study within a career program?*

*Leslie- Because it is not only the language, specially where I study French. My teacher is French, so one gets to know a lot of features about the culture, and about a French person's lifestyle. It makes it more than just a course, like where I learn grammar and stuff. It is not boring when one gets to know people, and well, I don't perceive it as an academic burden but more like I can clear my mind away from uni, and speak in another language (...) It's more like a hobby.*

*Leslie Indigo, 19 years*

For Indigo, the space of learning is reduced to the educational construction made at UCR, where duties and activities associated to classrooms-as-containers are not considered as soon as the academic calendar is over. Unlike being part of a course at a university, Leslie described a different space of learning while practicing French. In the words of this student, it is interesting to note the importance of

being an active participant in the social elements without feeling threatened, as this student confessed he felt when attending courses with educators such as Teacher Cyan. It is interesting that Indigo speaks of this beloved space of learning in terms of a “hobby”, a kind of learning that happens with languages, something which is enjoyable, mind-clearing and not boring as formal academic course is. In fact, for most of the interviewed students in my study, hobbies, fun, or sharing with others weren’t concepts related to learning. Instead, to learn something meant studying, or memorizing a topic to be able to pass an exam. Ronni Pale from the White Course said during an interview:

*Ronni- For example, my dad likes anything to do with building a lot, for that he has taught me a lot about constructing things. I like to paint, or I like it a lot if I have to create and make furniture. So, I learned to use tools. And my mom is a baker, she bakes cakes. I learned a lot from her about making pastry and meals, I like cooking a lot.*

*Researcher- “How do you compare the learning you have with your parents and your family circle to the educational process you have at the university? How do they differ?”*

*Ronni- “Oh well, the thing is that obviously, everything at the university must be more serious”.*

*Researcher- “Don't you think it's serious?”*

*Ronni- “What?”*

*Researcher- “The educational process you have with your parents?”*

*Ronni- “No”. (laughs)*

*Researcher- “Is it more like enjoyment?”*

*Ronni- “Yes, exactly. But here at the university, it's more like I have to learn it in order to pass the course and all that”.*

*Researcher- “Ok, then that means you do not enjoy that?”*

*Ronni- (laughs) “Some courses no, I don't. It's just that some courses are too exhausting for my mind.[...] There are other classes where I must be completely silent, and I need to talk to someone so I can understand topics, not just listen to the teacher”.*

*Researcher- “And with whom are you talking in order to understand contents”*

*Ronni- “With my mother”. (laughs)*

*Researcher- “With your mom?”*

*Ronni- “Yes”.*

*Researcher- “So you guys have a space in the house where you take a while and talk to your mom or how does it work?”*

*Ronni- “Very seldom now. Before when I was in high school, sure. I often said to her -mommy sit down so I can tell you about my university topics! She did and slept, all the same I kept talking out loud”.*

*Ronni Pale, 18 years old*

Through their different answers in each interview, students were able to describe their space of learning in different terms. Some like Taylor Azure from the Blue Course, were positive about their space as students; “for me, life as a whole is a school,” was the answer of 20-year-old Azure. In the Pink Course, the space of learning was much more flexible in terms of participation. It was not exclusive.

During one session an unidentified student joined the class without prior announcement, after requesting to be part of the activities during that single session. Teacher Pink had no problem with it and without hesitating, welcomed this learner. In other courses, students reacted enthusiastically and willing to participate as soon as problem-based strategies, simulations or competitions were considered as part of the educational design. Nevertheless, some students like Katsumi Grass, see knowledge as something to be “absorbed”, under pressure, especially when coping with an evaluation:

**Because of the level of the course that I am taking, for me the best way of learning is under pressure. So, let's say, if I have a test in the afternoon, a whole morning of studying with classmates is super productive. Right, more than two months of classes, something like this. Because it is the time you need to swallow everything you need to absorb, knowledge, it is the time that one is really interested, because there is a test coming.**

*Katsumi Grass, 22 years old*

On the other hand, most of these educators were clearly aware of the importance of being in contact with the outside, with other communities of practice beyond the classroom in order to better understand their field of study. In an attempt to expand student's spaces of learning in this belief, Teacher Yellow announced

that one of the main projects for the students to develop that semester, was to choose a recipient outside their community.

Another example was portrayed by Teacher Cyan, who after being asked about good examples of teaching, identified initiatives in the informal domain of education or alternative systems. In his opinion, these are more flexible, like technical schools and lifelong learning structures. Similarly, students in the Yellow Course were encouraged to explore beyond the typical topics of their group, either a new discipline around the university or a company outside the institution.

For Teacher Blue the classroom was an important place, although he considered a career as something that happens in the field. Despite this conviction, one of the constraining elements noted by Teacher Blue was related to the standardization processes in the study plan. Forced to follow a common lead, Teacher Blue described this initiative as something “complicated”, suggesting there was a difference between their conditions as “regional campus” and the “central campus”, from where the mandate originated.

On the importance of the outside:

**"What happens with this career? You don't find a book that tells you how to procede, you don't find it! So, there is nothing written. I wish at some time to start writing; I haven't been able to. So, what happens with this? We are not used to going to the library to research something, because there is nothing, there is nothing! If you want to do research about other things, maybe I will go and search.**

*Teacher Blue, 49 years old.*

Taylor Azure, one of Teacher Blue's students, expressed another aspect about the importance of the outside, which was something alien for them. On the importance of the outside:

**(...) but I say they teach us how all things are done, and they show us how things are done, what the law says and other regulations, but we never see it, that is, we do not go to an agency and see how an agency works, we never do it, so I say, everything remains on paper, and what is on paper I may forget. But if I go... see that's what I'm telling you, when I see, when I do, I learn more, that way.**  
*Taylor Azure, 20 years old.*

As it can be seen in Teacher Blue's comment, the difference between campuses was noted. Traditionally, this complaint was expressed by some members in courses located on campuses different from the Rodrigo Facio Campus. They reported the disadvantage whenever they were in need of resources inside their classes. According to their version, tools are available at UCR that were unavailable to them, because of their geographical location. Apparently, such tools remained located exclusively on the Central Campus, guarded under certain regulations to the detriment of the students.

In most of their cases, teachers implemented educational strategies privileged with control and punishment actions. These maneuvers were aimed to take place within the class. However, educators who identified themselves as digital media users accounted TICs as a means to control actions beyond the classroom, in its benefit. Teacher White, a confident user of mobile phones and mobile applications, mentioned the advantages of such flexibility:

**There is also Whatsapp. I have a student who is tied to Whatsapp. Others use Facebook messages and others call me by Line. So, I tell the kids, well, for you to know, I have Whatsapp, Viber, Line,... so you can communicate with me. I tell them so they can't say afterwards, 'I couldn't reach you! I couldn't ask you!' No! You already know that as soon as you send me a message, my phone will ring. (...)**

In the Cyan Course, for example, the space of learning within the classroom spins around the educator's performance. Because of the energy, motivation, mastery of contents and administration of the audience, Teacher Cyan is a precise orchestrator. Nevertheless, this space of learning is highly hierarchical, a place where the professor's role excludes any co-protagonist. Aware of this, Teacher Cyan explains it in the following way:

**The style remains I am very invasive, apropos of teaching this stuff I am invasive (pauses and reflects)  
 if people do not react I try to get into people's mind, I do it like this to people's brain (shakes hands vigorously)  
 And I tell them Speak! React! Yell! or whatever! ehhh (thinks about it)  
 I don't let anybody, be, like distracted, that is why, I say "right Vanessa?", "right "x" ? And that is because I see them distracted. So, people are always alert. The style remains.**  
*Teacher Cyan, 47 years old*

## CHAPTER 6. FINDINGS AND FURTHER REFLECTION / TO IMAGINE WITH EYES WIDE OPEN

This study was intended to reflect on *spaces of learning* constructed at a university in times of digital media. To address this matter, I focused on *space* as the central affair, and later introduced “Learning by Wandering”, a perspective to emphasize the importance of context and experience in university teaching. Highlighting space as a central issue for higher education in times of digital media, becomes relevant when:

- literature evidences the lack of conceptual clarity in educational environments at a university, often when computing machines are considered within the classroom. This issue deteriorates with the appearance of connected mobile devices,
- the space of learning at a university is meant to have an impact on the student’s way of approaching another space: the outside world. Such a topic is fundamental to the configuration of educational strategies. The Universidad de Costa Rica has announced the importance of this issue to university teaching in times of digital media.

The study has as its primary question: *what is a “space of learning” in higher education from students and professor’s perspectives at the Universidad de Costa Rica?* Moreover, two sub-questions were important for my exploration:

1. *What kind of “spaces of learning” are being offered at the Universidad de Costa Rica?*
2. *How to reconsider the “space of learning” at a university?*

To illustrate this analysis, a qualitative ethnographic case-study conducted at the Universidad de Costa Rica was presented, where I examined different contexts, paying special attention to these categories: *teacher and student’s role*, *digital media in the classroom* (techniques, teaching and learning activities), and *configuration of the space of learning* (teaching intention, didactic strategy, context and theoretical foundation).

Overall, the spirit in this thesis was to reflect upon our model of education and how we construct spaces of learning at a university, taking into account relevant perspectives and metaphors for teaching as a social and contextual act. As seen by Uljens (2003, 57), it is agreed that for this topic, there is probably not much sense in discussing universal theories, but rather it is better to offer different perspectives and theories to enrich the discussion in close connection with our contexts.

## 6.1. FINDINGS

The main empirical findings in this thesis are in *Part 2 - Reflecting in Context*, within the respective sections: Chapter 4 – Space as an educational approach / More wheres, less whats (see p.180), and in *Chapter 5 – The space of learning at UCR / Immobile bodies with mobile minds* (see p.256) In this section, I offer a general overview of my findings.

In reference to the main question of this research, the *space of learning* at the university, it is constructed according to a model of education that privileges *academic knowledge*. It is a bureaucratic configuration strongly based on standards, control and prediction. Under such conditions, the space of learning at the university is *shaped in the light of educational strategies*. These structures are assessable based on the following criteria: *teaching goals and outcomes, a context of the content, abilities and competences of students, necessities and motivations, effectiveness of strategy, general and specific objectives, theoretical foundations, teacher's role and responsibilities, student's role and responsibilities* and finally, the *context role*. Universities like the Universidad de Costa Rica adopt this approach, as they are institutions that foster formal education for the construction of knowledge.

Similar to *bureaucratic artifacts*, the space of learning is an artificial structure, designed to enclose the act of intentional teaching. In this configuration, *educators are the leading figures*. They are in charge of *changing* the way students build their knowledge about the *outer world* and, for this sake, they design *content-driven* sequences within their didactic strategies. At university, these spaces of learning are *structures constrained in a nested doll principle*, which obeys a *hierarchical* organization of instances that relate and influence each other in different ways.

The space of learning is *fixed* and *centralized*, it takes place *within the boundaries of a university campus*, where indoor-facilities, e.g., classrooms, laboratories, lecture halls or libraries are regularly occupied, administrated by a *time-based structure*. This educational design is orchestrated *inside a physical place*, where teachers and learners gather regularly for a duration of time, limited in their physical mobility as actions are traditionally constrained within a *classroom-as-container*, where a teacher is fully responsible to implement an educational strategy in terms of formal education, following a tacit or explicit code of behavior. In each of such instances, protocols are needed to execute the study plan.

In this thesis, some of the most noteworthy issues related to the construction of spaces of learning were unveiled by way of *an ethnographic case-study conducted at The Universidad de Costa Rica*, since it offered a clearer illustration of the educational approach towards academic knowledge. It confirmed that educators are of paramount importance for the educational structure at a university, *around* and



by this person is the *space of learning being constructed*, which was observed by Laurillard (1993). Based on this, it was found that educational strategies intend to support learning processes of students, being *vulnerable to the teacher's context*.

Either as private subjects or in direct relation to their duties in the university, it was found that their space of learning were directly associated to factors such as *time management, tiredness, their membership in UCR, recognition (self and from others) as teachers, life conditions or bias based on their social affiliations with students and other colleagues*; the space of learning is a place that *varies according to educators' conditions* as they are in total control of it. Under this model of education, teachers have no choice but to adopt functional didactic designs, capable of assisting them when dealing with many students at once, relying on *standards, instruments and general actions* to configure their teaching.

*Students* reported a direct link between their spaces of learning and their professors. Notwithstanding disciplines or age, they were able to evaluate and discriminate between *a good and a bad course, always referencing the educator*. When negative, they told of *inadequacies* in the way they were *treated, lack of attention*, or simply that they were not seen in a more *equal condition* with others. Thus, the space of learning allows, even fosters, the *existence of hierarchies and separation* among members in the same classroom. Often, students complained of situations where after being asked to execute certain activities, they would feel negatively affected because of conditions related to their classmates or professors. They mentioned issues of inequality, the lack of possibility to profit from collaboration, or poor communication.

While the *space of learning* in universities has been traditionally designed to provide learners with content-based units and is *administrated by human beings with mechanistic ideals*, the emergence of automata challenges the traditional classroom whenever it is reduced to a place where teachers offer descriptions of the world, highly dependent on their limited contexts, speaking skills and lively experiences.

Reduced to theoretical knowledge, educators seem to have problems finding significant strategies for students. Under these conditions, students prefer to venture into the excitement of a *metaphor machine*, which is capable of producing an infinite number of descriptions based on its mechanistic configuration, without certainty of relevance to their contexts. All the same, it seems more exciting for students because of the level of immediacy they have with phenomena taking place outside.

Assuming education as a rational act brings *time-based criteria* into the *educational structure*, where the importance of *control* and *prediction* keeps emerging, indifferent to descriptions being used within the reduced learning space. Furthermore, it was found that to be affiliated to bureaucratic

structures, it would appear that humans must adopt the mechanistic protocol, and try to cope with its increasing *speed*. All the same, on top of a weaker bureaucrat, a fitter one emerges, this in terms of *remediation* as seen in McLuhan and Bolter & Grusin.

It is interesting to note that despite the popularity of the latest machines, *digital media remain questionable, mistrusted or forbidden* in the space of learning at universities. All the same, whether integrated into or ignored in spaces of learning, *students and professors make use of digital media all the time*. Similarly, at the Universidad de Costa Rica, mobile devices (*mostly smartphones*) prevailed among students and teachers. Hidden in their pockets, face up in plain view on their tables, or simply to be used from time to time, technology in the space of learning appears currently to challenge the educator and his didactic strategy, as reported by authors such as David et al. (2014); McCoy (2013); Hassoun (2014).

Like in Prado (2008, 306), the Latin-America tendency is similar throughout spaces of learning at places like the Universidad de Costa Rica, where technology does not play any declared role within the educational design. Yet, it was observed that often *digital media played an important part related to control and surveillance*. Teachers exclusively talked about the use of social networks and Instant Messaging services to *keep track of their students' private life, to periodically remind them of projects* to be presented during their upcoming sessions, among others.

The relation between digital media and the space of learning indicates that *technologies don't assist as promised* in the construction of knowledge in the classroom, nor do they incline towards settings in favor of higher education. On the one hand, *students and teachers at the Universidad de Costa Rica were fluent users of digital media*. Mobile technologies or online services such as email were very frequently used during their everyday and even in class; on the other hand, these *students were unable to recognize themselves as "knowers" of such technologies*. As described in section 5.2.2., a considerable sector of students said they *made use of digital media for instant messaging or social networks online, while their class was taking place*. In addition, *professor demonstrated little efforts to include digital media* into their lecture plans among their didactic strategies. This is one of the most significant issues to consider, since without exception, educators at UCR considered digital media as a "very important" element for the space of learning.

*In relation to my first sub-question*, it was found that the *space of learning is connected with the outer world through the activity of teaching*, an *act of mediation* carried out entirely by teachers. Given that the *space of learning isn't connected directly to the outer space*, it is agreed that teaching is a medium that acts upon an indirect level of knowledge, where *students and teachers reflect on the experience of the everyday or*, as Laurillard said, *they experience the experience of the world, a mental*

*activity* that depends profoundly on *representations of the outer space*. These representations are designed by an educator, who after a declared set of intentions or goal, attempts to enlighten students about a better way to approach certain aspects of the outside world, while being inside a classroom. In this sense, the space of learning is a place of immobile bodies with limited or mobile minds.

In awareness of the importance of a *context*, the *street*, or the *market* -as some of them named it- teachers and students at The Universidad de Costa Rica dealt with this element in various ways. They consistently settled a *difference between the actions happening inside and outside* the classroom, mindful of the *outside as fundamental to their effort in class*. However, once their classes and spaces of learning were over, they faced the outer space with a different attitude, unrelated to their discussions or exercises in class. Nevertheless, *students and professors differentiated classroom, their space of learning, with their informal spaces*. In their everyday, despite homework or duties, they were entitled to continue with other facets of their life, not being urged to behave according to a code or regulations, something traditional for the structure of formal education.

At the Universidad de Costa Rica, many teachers commented on their *interest about implementing strategies* in order to bridge actions in their course with environments elsewhere, admitting that their topic of interest was happening there. Yet, their *major issue was the urge to meet certain regulations or standards according to a curriculum or study plan* with a known quota of topics and contents.

Moreover, not only are educators the main ones responsible for designing a didactic strategy, but they are also the ones in charge of presenting *meaningful descriptions of natural phenomena* for their students. These representations are made based on their individual experience of the outside, and with this, educators aim to change students' perspectives in the everyday. Nevertheless, it was found that some students didn't consider their space of learning at university in times of digital media, a place to learn. In their case, educational actions within a classroom had nothing to do with their everyday. Indifferent to this structure or to the kind of information presented by teachers, several interviews showed that their space of learning was not exclusive to the classroom. There were also those cases where students evidenced unawareness of their learning processes, unable to connect the idea of "space of learning" next to enjoyable experiences at alternative locations outside, in their everyday life; instead, they thought of spaces of learning as instances where they studied or memorized a topic to be able to pass an exam.

*Mindful of the previous findings, with my last sub-question a relevant issue was tackled: what is a space of learning?* To proceed with this question, this thesis *considers that*:

- our model of higher education fosters learning by means of academic knowledge primarily,

- the spaces of learning at university in times of digital media are limited places, constructed in view of time-criteria, hierarchical control, outcomes and prediction,
- at a university, students learn about descriptions of the outside world offered by teachers, in order to create knowledge of natural phenomena,
- learning happens naturally, contextually and immersed in practices. It is not reduced to mental processes disrupted by the experiential interface.

For that, I propose an alternative perspective for analyzing the space of learning at a university, this time unconcerned with structures constructed around descriptions of the outside world (contents), but in terms of human space. This emerged in acknowledgement not only of consulted literature, but also in terms of the empirical results obtained during my fieldwork and based on my own experience as an educator at the Universidad de Costa Rica. In order to answer this question, clearer concepts for the construction of spaces of learning were needed, an initiative that matches the (The Royal Society 2012; Thomas and Brown 2010, UNESCO 2013; Sharples, Taylor, and Vavoula 2007).

My analysis for defining the space of learning is based on a stance of situated learning, where context is an element in the forefront. The learning act is certainly taking place in time insofar as it belongs to the dualism in connection with space. However, the learning process is not conditioned by time, but by space. Clearly and prominently, the work of Otto Friedrich Bollnow is fundamental to the analysis in this research, focusing attention on the concept of experienced space, which he discusses in *Human Space* (2011). Human space is a concept differentiated from place, location or position. In agreement with Bollnow's categories the space of learning is individual, highly contextual and created with human activity, immersed in dialectical movement between the inside and the outside. These are fundamental notions in this thesis.

To clarify this issue, next to theoretical references, I present a series of metaphors and reflect on some other stories to illustrate my findings on the go: the classroom as a house (see p.138), the user metaphor (see p.182), the cooking metaphor in John Dewey's Laboratory School (see p.191), or the Minerva example (see p.200) and the stories of wandering learners in Stuttgart, Berlin, and Chicago (see p.188). However, among all these elaborations, the *Learning by Wandering: A metaphor for changing perspectives* (see p.19) should be considered with closer attention, as it is intended to raise a statement for the entire document. There, I present the figure of the 'Geselle', in middle of a special journey that can take him anywhere, yet he is always supported by an educational structure of guilds.

Therefore, part of my contribution to knowledge is *Learning by Wandering*, a framework for leading traditional notions of university teaching towards clarity, based on an approach of *Learning by*

*Schooling.* For this, the illustration obtained during my fieldwork phase in Costa Rica is taken as a source to create a binary confrontation of concepts, presenting known approaches such as academic knowledge-oriented structures, in front of another one which is closer to a framework of social practice and attentive to the space as its core. A collection of these confronted concepts is delivered in Table 07 Learning by Wandering as a gesture of conclusive figure. This can be understood extensively in section 4.3:

In an educational approach that embraces space as the central element,

*the student is like a 'Geselle';*

In an educational approach that chooses space as the central element,

*the professor is like a 'Meister';*

In an educational approach that decides on space as the central element,

*the didactic strategy is respectful of each participant's space of learning.*

In an educational approach that selects space as the central element,

*digital media are tools.*

In an educational approach that opts for space as the central element,

*the context is the outer world to be experienced.*

In an educational approach that embraces space as the central element,

*the theoretical foundation is a collection of knowledge perspectives.*

Being thus, I suggest thinking of the act of learning as something complete only through active participation of an individual in a social structure. It is comprehended within the realm of the experiential and its ultimate goal is to foster individuals to transcend information into knowledge, this after natural inquiries. The space of learning is unique to each individual, hence it cannot be understood according to fixed, linear or forecast criteria.

Participants in the space of learning are recognized as Homo Viators. Next to the idea of immersion in a new culture of learning (Thomas and Brown, 2011) it is fundamental to consider facets of humans in the act of learning: Homo Sapiens (the one who knows), Homo Faber (Sennett 2009) (the one who makes) and Homo Ludens (Huizinga, 1968) (the one who plays), are presented as a mixture of the ideal learner who with curiosity, is driven by a natural desire to explore in activeness, in secureness, adventure, homesickness and farsickness (Bollnow 2011).

LEARNING BY WANDERING		LEARNING BY SCHOOLING	
	Details	Details	UCR
'Wanderschaft'	Family (trust, contabulation). Member of a guild (initiation ritual, proved affiliation and level).	Variable (competition, friendship, standards). Chosen to be user of study program (non-initiated, admission test, grade-based national system).	Student
'Geselle'	Individual skills development (highly contextual). Leisure in participation (self-motivated). Mobile bodies with imaginative minds. Altering memberships. Homo Sapiens, Homo Faber, Homo Ludens, Homo Vator.	Expected abilities and competences according to profile (market related). No leisure in participation (random self-motivation). Immobile bodies with limited minds. Altering memberships. Homo Sapiens, Homo Faber.	
'Meister'	'One-one' with 'Geselle' (trust, negotiation). Recollection of what is radically new. Phronesis (virtuoso social, performer, political actor, wisdom, mastery). Full membership and legitimacy. Leisure in participation (self-motivated).	'Many-one' with students (office hours for individual attention, respected). Key element, essential for the students. Recollection of everyday activity. Experienced. No identification as professional in higher education. Neutral. Altering membership, no legitimacy (part-time, temporary or interim). Leisure in participation (self-motivated).	Professor
Space of learning	Networked guild. Spacious time (minimum time/distance to return, locations suggested). Expanse, movement between 'Fernweh' and 'Heimweh'. Community of practice. Low semioticity.	Study program in campus. Curriculum (semester, credits, defined courses, requisite and prerequisite). Classroom-as-container (nested doll principle, outside mandate). Configured and managed exclusively by the professor. High semioticity.	Didactic Strategy
'Telos'	Gift to 'Geselle' after a collection of what is radically new. Spaces (wheres). Contradictions.	Teaching goal with expected outcome from students. Contents (whats). Standards.	Teaching goal/outcome
Tools	Bridges for access. Boundary objects. Very frequent designers of their own tools. Critical of digital media. Highly related to their practices and to wander through their journey. Metaphors (holistic representation of the world). Ubiquity, orientation, record (map, shoulder bag, wanderer's staff, clothing code, travel book, 'Zinken'). Cold media. 'Unfinist' activities.	Control Very frequent users of digital media (mobile), and electronic communications (email, IM). Unrelated with the class, more for their outside. Initiation, simulation, models (fragmented representation of the world). Prediction, orchestrate, prove (methods, evaluations, final grading, lecture, questions for known answers). Hot media. Calendarized activities.	Techniques/Activities
Outer world	Constellation/ no fixed plans. Experiential interface. In constant change. <i>Indwelling</i> . Body clock.	Highly regional/disciplinary. Post-medial condition. In constant change. Social clock.	Context
Knowledge perspective	Situated knowing, everyday knowing, <i>Bildung</i> . Social practice: particular, context-specific knowledges. Poetic imagination.	Fact and rules/decontextualized, general knowledge. Technical rational; general theory. Rational knowledge.	Theoretical foundation

Table 07. Learning by Wandering and Learning by Schooling at UCR

The space of learning is never “teacher-less”, but instead, reflection is needed for new configurations that allow teachers as “Meisters” to be assisted with media as tools in a way that the joined interaction with students as “Gesellen” isn’t diminished. In this understanding, the educator is the only medium impossible to remediate.

To better understand the roles of ‘Meister’ and ‘Geselle’, Etienne Wenger’s “Communities of Practice” is useful for comprehending the roles of members of communities of practice, in this case, a classroom with a teacher and students. Here each of them according to his engagement level with the world collects experiences as trajectories of life, full of capabilities and skills to perform in front of natural phenomena. Negotiation of meaning among members of the community occurs according to their repertoires.

In such terms, a ‘Meister’ offers metaphors that are the product of a trajectory of ample repertoire (phronesis), different from a professor, using imitations (simulations, models) of the outer space. The activity of university teaching in times of digital media is designed by the ‘Meister’, but it isn’t performed solely by him. For this, this section should be a gathering point for authorities, students, community members, programmers and professional in different roles, as they with their trajectories are altering spaces of learning in higher education.

Teaching shall be understood as a political act, as acknowledged by von Glasersfeld (1996, 176). It should aim for freedom in terms of Arendt (1998), who presented it as possible only as a political act, closely related to action, a human act that triggers something completely independent and unpredictable. I suggest it is closely related to the educator’s gift of teaching, where this individual offers something radically new to a student. Moreover, we agree with G. Biesta and Säfström (2011) that education needs to be an act free of structures that foster compulsive control as a means to achieve its goal.

The space of learning is comprised of the inside and the outside (Bollnow, 2011) and isn’t reduced to a classroom, where one performer orchestrates in a centralized way everyone’s spaces of learning, concealed in the middle of descriptions of the outer world, regulations and control. I offer a metaphor where universities are either houses with closed doors and closed windows, or houses with open doors and open windows (see p.138).

In this case, it is important for educators to adopt a clear position towards the way they design their strategies in order to benefit discussions about important factors in society, assuming the role of emancipators or facilitators of topics that as lively metaphors, establish new questions without exact answers. In this sense, we agree with the position presented by von Hentig (2006, 72), where inspired by his “*service learning*” (see p.134), educators become examples with their practice on how to

approach the outer world. They do this not necessarily in terms of offering exact answers, but by turning attention away from methods and procedures, and instead observing the value of decisions, and how to make decisions pertinent to each of our contexts.

In times of digital media, it is agreeable to speak of the post medial condition, where Peter Weibel speaks of “one universal medium” (Weibel 2006, 15). Digital media is then visualized as a collection of elements that condition each other and it becomes trivial to speak of one specific technology. The pulsating speed of media continues its accelerated pace, and since 1945 presents us with devices in the most trivial, cheap and reliable way imaginable (Bush 1945, 113; Next Thing Co, 2015). To embrace our post medial condition we must stop, once and for all, bringing into focus the idea of the machine as fundamental to an educator’s design. For the space of learning we must raise reflections away from the computer, going beyond the computer.

But to be able to perceive the whole algorithmic sign, one must be able to speak the language of computers. This is why our efforts should go into conceiving programming languages able to be “low floors”, that is friendly enough to approach and get started; “high ceilings”, in the sense of being robust enough to allow increasingly complex projects as people get more acquainted with the environment, and lastly, with “wide-walls” to support many different types of projects so people with many different interests and learning styles can all become engaged. These are fundamental characteristics for Resnick et al. (2009, 63) based on his reflection about Seymour Papert’s ideology. Many others, like Ira Greenberg, find this approach to be necessary all the same. Finally, he outside is characterized in different ways:

I present this in terms of a “white water world”, as John Seely Brown (2015) characterizes, which presents individuals with an outer space of changing capacities, rapidly, apt only for skillful kayakers in the middle of a roiling river with white waters.

Knowledge is constructed by human beings and is inherent to personal experiences, actively constructed by each of us only while being social. One cannot ‘take it’, ‘pass it on’ or to the great despair of many, be ‘shared’.

The space of learning isn’t directive, nor something to be justified, in fact, it is suggested to think of any education at a university in terms of the natural aspect of learning, which according to Lave and Wenger, is intimately associated with contexts and practices. Inspired in *Bildung*, the space of learning at universities should aim to become an act of liberation where the subject is aware of the space of another and respectful of it. The space of learning is about prioritizing the free act and the changing space of individuals, and to support it as it engages in participation throughout communities of practice.



## 6.2. Attending to some last recommendations

### / Dear UCR

In the light of the analysis presented in this thesis, and to further the interests of the Universidad de Costa Rica, I propose a series of recommendations meant primarily for university teachers at the Universidad de Costa Rica and also for those instances and authorities able to grant university teachers and students with possibilities to expand in their spaces of learning.

Following the “Learning by Wandering” approach, my intention is to reflect upon educational designs being constructed at UCR in times of digital media, in order to improve the space of learning shared by students and educators as communities of practice in each of their endeavors.

(1) It is agreed that the Universidad de Costa Rica is an institution that constructs spaces of learning that aim towards humanistic ideals, while being organized as a bureaucratic organization. (rsitaria “Rodrigo) In view of this, the UCR is promoting the idea of precise curricula of academic knowledge, enough to educate students about better ways to approach the outside world.

In this sense, it is necessary to discuss a revision of the institutional stance on initiatives where concepts such as “general education”, “national curricula” (Biesta 2003, 63) or life-long learning (Cowen 1996, 255) are presented. These can become vehicles to promote, under false expectations, new means to officially limit the space of learning. They also can strengthen the idea of massification (Gibbons et al. 1994) in higher education, a concept that acquires some acceptance throughout higher education in relation to digital media initiatives, following questionable trends such as those set by Massive Open Online Courses.

(2) Moreover, it is fundamental to raise awareness at UCR about fundamental topics related to digital media, among them one of uppermost importance: Internet privacy. Immersed in a fluctuating society where a large sector seems to foster technological consumption for different means, it is important to act upon prevailing risks we are exposed to, whenever we make use of interconnected machines. As most of these trends in favour of Mobile Learning are aided with technology of this kind, a high level of responsibility and challenges is implied for an institution like the Universidad de Costa Rica, that has high esteem and credibility in the region.

For this it is fundamental to remember cases such as Snowden’s (see p.214), today more than ever in times of digital media, interconnected and pervasive. All in all, the position held here remains closer to the philosophy of initiatives such as the Slow Media Manifesto, the degrowth movement and other fronts previously discussed in favour of critical thinking and democracy. (see p.71) In times of digital media, there is no choice but to be attentive to the ways we bring technology into our experiential way

of learning, since as already discussed, technology is by no means neutral.

Our spaces of learning should consider perspectives of all kinds to approach the natural act of learning, for this it is necessary to comprehend higher education not in terms of limitations, remaining inside and controlled by our bureaucratic structures. Efforts should head towards supporting rich and meaningful relations between communities and members of all different societies that are continuously changing, deforming, expanding or manifesting in ephemeral ways. Learning spaces must be built based on a spatial understanding; such a paradigm should be taken into account in order to meet the original humanistic aspiration officially included as part of the organic statute of a place such as the Universidad de Costa Rica. As shown, the humanistic project is intimately linked to the concept of *Bildung*.

(3) According to documents, articles, press releases, and informal conversations with decision makers during my fieldwork on different campuses, it is my feeling that the atmosphere is favourable to exploring initiatives in favour of emergent configurations for the spaces of learning at the Universidad de Costa Rica. Initially, one of the first institutional platforms that may end up being viable to open up spaces and coordinations, is the *Departamento de Docencia Universitaria* at the Universidad de Costa Rica.

(4) Let's do something is not a good start. Communities should start with already active groups that share questions. Therefore, it would be very relevant to include in an initiative towards "university and human space", projects such as VUS-05 "Promoción de la equidad mediante acciones innovadoras interinstitucionales e interdisciplinarias como esperanza de movilidad social", VU-20 "Ampliación de horarios y mejora de los espacios de estudio en la UCR", VU-13 "Hacia una universidad saludable", QA-2 "La interdisciplinariedad y la transdisciplinariedad en la formación profesional", and QA-38 "Creación de las carreras interdisciplinarias en Sedes Regionales y la normativa universitaria", as a first effort of the institution.<sup>128</sup>

(5) The topic in relation to foreign languages should be considered as fundamental. Language is one of the most important boundary objects to expand and, to my mind, remains the most important formal system of signs creations. English is, in that logic, the most universal of the languages so far. The Universidad de Costa Rica should foster initiatives to address this issue, seeing that only a 10% of Costa Ricans are proficient in the english language, and only 11% of promoted students in High School shares this condition. (Programa Estado de la Nación 2011, 41) As a first initiative, UCR should facilitate spaces to have students and professors engaged in active practice, periods of language where communities gather and take actions in this matter, making special emphasis on those foreign students willing to be part of study programs at UCR. This is fundamental in terms of von Glasersfeld, as an exercise to strengthen our semantic capabilities and the exercise of negotiation of meanings.

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128 A short description of each of these projects is attached as Annex 01

## Postscript

More than a decade ago, I stood in front of don Pedro, the head man in charge of operations. He was a powerful man in the company, certainly not the kingpin, but one of those self-assured characters who speak their minds with precise verbs and daunting attitude. He rarely mingled with us tiny workers, something that made me feel uneasy, mostly because I didn't know how to approach him. I was just a teenager freshly out of high school, performing my first job next to grown ups and having the least idea about anything but this: I was about to make an important decision in life, while not being completely sure how. I just felt it. There I was, about to resign my job in order to become an artist; a painter, to be more precise.

*Look, you want to go to University to study Fine Arts, is that right?*

He approached me gently, almost like a loving father does.

I hesitated slightly, not knowing how to answer.

*Yes, sir. That's right. I am deeply thankful for the opportunity you have given me here, but I was admitted to the painting program at the University of Costa Rica and I plan to go for it.*

*Painting!?! Now, kid, but seriously...*

He insisted, now with a sarcastic tone in his voice.

*Do you think you can make a living by becoming a painter?*

He was completely right. It made no sense. Still in front of don Pedro, a lucky 17-year-old with a secure contract at this important company, earning real money, was about to make a stupid decision. It still made no sense, but never before had money or declared security been what drove my spirit. It was passion and curiosity; my pride to remain sovereign; you know, that luxury of not doing anything because of being told to, but strictly going after inner convictions, requiring the whole of you, invested in finding something else.

To better explain my decision and its reason, I'm in need of a special term that finds no equivalent in the English language. 'Fernweh' is a German noun that literally means 'farsickness' (or distantsickness). However, this concept isn't in common social use. It is different from 'Heimweh', its antonym, a word that properly translated as 'homesickness', is extensively used to express that terrible feeling experienced by anyone regretting not being home.

The beauty to be found in 'Fernweh', despite its lacking a real translation, lays in its semantic value. Both 'fern' and 'far' are in the same category, however '-weh' as a particle

evidences an aroma of the romantic soreness that isn't related to any pessimistic sense, whereas 'farsickness', our forced translation, carries an unavoidable negative connotation whenever we think of the '-sick-' unit.

On the one hand, there is nothing wrong with being 'Fernweh', but surely with one being 'farsick'. When being 'fernweh' one is longing for something which is not there, a determined or undetermined object which remains at a distance and motivates an unquiet soul to remain curious, hungry for the unreachable horizon. It was exactly this years ago that made me stick to an uncertain choice, something powerful enough to resign security, to leave home behind, and welcome stillness as a necessary exercise to reflect about my reality.

Enveloping myself in the fernweh spirit enabled me to embark on a trajectory of changing shapes. During university I eventually realized everything was alright and while growing into new perspectives, this daring behavior that favored "risks" increased. My belief is that this adventurous spirit may play a vital role for those interested in finding freedom and constructing knowledge.

Truth be told, it was digital media that ultimately assisted me to navigate in pursuit of my fernweh, and there, in the middle of this journey, I got to know Frieder. "A journey of open questions, keen of no destination but the joy of uncertainty", that was the starting point of our wandering, one summer evening in 2009 somewhere in Costa Rica, each of us holding a beer. Little we knew that essence was to remain the wind on our backs.

The process that bursts in front of anyone willing to assume a doctoral thesis should be one of unimaginable dimensions. Waiting for you, an intense fight against the self awaits clumsy; immense. At times it is about embracing the solitude of the wanderer that gives up uttering, moves light-weighted and renounces furious rationality. Then the day is new, and it's about struggling to awaken, to remember what it is like to have sharp senses and keen explanations. In the meantime, the path continues its eternal way into foggy uncertainties, each of them calling after the other.

You now read this, but in order to cast these words, a mute jungle of light and shadows, of laughter and lessons, Sandtaler and coffee, hard work and conversation, stand behind it all. Together with my dear advisor (hell no! my dearest friend), I came to learn about learning. That teaching is about loving, and that more powerful than any lecture, a good story has the potential to resonate for life.

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## Annex 01

Code/ Paper title	Author(s)	Status	Summary	Source
EGH-53 / Virtual meetings at university for decision making.  [ <i>Reuniones virtuales en la universidad para la toma de decisiones</i> ]	Javier Trejos Zelaya	Approved	His argument pursues to consider the long hours needed to attend administrative issues throughout departments, commissions, among others. For it, the proposal aims to consider ICTs in order to have the possibility to meet using <i>telecommunications application software</i> . For him, this would be an optimal answer in terms of saving time, money, among others.	<a href="http://setimocongreso.ucr.ac.cr/node/287">http://setimocongreso.ucr.ac.cr/node/287</a>
VU-24 / After-class attention at UCR.  [ <i>La atención extraclase en la UCR</i> ]	Madeline Howard y Carlos Mora	Approved	Their discussion advocates in favour of <i>telecommunications application software</i> , this to offer students with the possibility of online office hours after their courses alternatively to the traditional face-to-face option. The proposal intends to include the use of different types of software (mediums), including email as part of the official hours quota.	<a href="http://setimocongreso.ucr.ac.cr/node/76">http://setimocongreso.ucr.ac.cr/node/76</a>
VUS-05 / Fostering equity through innovative and inter/trans-institutional actions in hope of social mobility.  [ <i>Promoción de la equidad mediante acciones innovadoras interinstitucionales e interdisciplinarias como esperanza de movilidad social</i> ]	Ruth de la Asunción	Approved	Her debate tackles the <i>Academic Aptitude Test</i> (Prueba de Actitud Académica), which is one of the official mechanisms that define the way students access formal education throughout public university institutions in Costa Rica. At Universidad de Costa Rica, students promoted from High School must undertake this exam to be accepted and depending on the resulting grade, they may be located within a given discipline. This event, claims de la Asunción as she presents factual proofs, is not allowing certain youth population to access the educative realm offered by universities. To a large extent, those individuals exposed to this obstacle are inhabitants located within <i>High Social Risk Areas</i> , and unattended geographical settlements in Costa Rica. Her proposal is a call to find a solution for this big problem.	<a href="http://setimocongreso.ucr.ac.cr/node/247">http://setimocongreso.ucr.ac.cr/node/247</a>
VU-20 / Extension of opening times and improvement of study spaces at UCR.  [ <i>Ampliación de horarios y mejora de los espacios de estudio en la UCR</i> ]	Anthony Cubero	Approved	The presenter addresses a discussion concerning study spaces throughout the UCR campuses. Cubero comes in representation of the UCR Students Association, and their attention is towards the necessity of spaces to get assisted on their academic processes. They talk about the availability of places, and more concretely they mention libraries as their first interest. They explain that is a known fact that the best universities in the world have libraries and study rooms open 24	<a href="http://setimocongreso.ucr.ac.cr/node/195">http://setimocongreso.ucr.ac.cr/node/195</a>

			<p>hours, 7 days a week; this way offering the university community but specially students with places apt for them to study and conduct research processes. This aspect is fundamental to satisfy the challenges implied whenever students are part of universities, at least those institutions fostering for high quality standards in the kind of education they offer.</p> <p>As well, they claim after the necessity of proper electrical distributions to connect their electrical devices while there. Their aim is to increase the opening hours of libraries, improve the electrical installation, and to promote in favour of investment to build study spaces to attend individually and group, to enhance their study, formation, recreation and meeting, both indoors and outdoors. Interesting is that they offer certain criteria about what should be of interest once they decide to take in consideration this proposal: they speak of noise management, ergonomic design, brightness, ventilation, among other features. As well, they suggest alternative solutions that point further in terms of spatial approaches. It includes the construction of study kiosks all over the different university campuses, each of those offering optimal conditions in terms of electricity, ergonomic design and sheltering solutions against direct sun exposition and rain. As well, and given the expansion happening in different Faculties at UCR, they ask for the redesign of old spaces left behind, in order to transform them into projects to allow students use such spaces following the already mentioned criteria.</p>	
<p>VU-13 / Towards a healthy university.</p> <p><i>[Hacia una universidad saludable.]</i></p>	<p>Juan Manuel Camacho, Oscar Molina y Gabriela Molina</p>	<p>Approved</p>	<p>Topic goes in direction of what the authors define as “healthy life”. In their proposal, they insist on planning space as the center of attention, this to promote a healthy culture among people through mobility, recreation and transportation and for that, to oficialize the <i>Health and Wellness office</i> as the leading entity to conceive institutional programs in favour of this topic. This may help to tackle bigger issues such as sedentary lifestyles in academia and all physical diseases connected to it. In order to achieve this, they propose a strategy that includes Bio-</p>	<p><a href="http://setimocongreso.ucr.ac.cr/node/165">http://setimocongreso.ucr.ac.cr/node/165</a></p>

			<p>Healthy Cycles program, as part of the <i>ActiveMobility Plan</i> that it is promoted at UCR. Since already many years, different plans and initiatives that seek to recover and redesign the central campus at UCR are present, this in order to allow more individual to move and walk, instead of allowing cars to be the only medium of transportation. This appreciation is even backed up by UCR's rector, Dr. Jensen who expresses that the automobile is a right but never a privilege, and by considering it to be a priority, universities given away our room to walk, study and recreate ourselves. In this order, the proposal indicates a list of different diseases and health threatening factors that appear correlated to the growing use of <i>passive transportation means</i> which are in detriment of physical activity, most specifically 21%-25% breast and colon cancer, 27% diabetes and approximately 30% of ischemic heart disease cases are reported by the World Health Organization. As well, one important factor to fight against through physical movement is obesity, which in terms of public health spendings goes up to a 25% more than what a normal weighted person would demand.</p>	
<p>QA-2 / Inter- and trans-disciplinarity in professional formation.</p> <p><i>[La interdisciplinariedad y la transdisciplinariedad en la formación profesional.]</i></p>	<p>Lupita Chaves, Jacqueline García y Magally Gutiérrez</p>	<p>Approved</p>	<p>In this presentation, a plea for the creation of new politics towards the fortification of grounding humanistic principles at UCR is presented. Presenters consider an inter- and trans-disciplinary approach to education, this to match the costarican and the institutional context in need of a rich landscape of experiences. This scenario would promote among students an integral and wide vision of nowadays challenges. To state this official, this proposal demands the inclusion of a new article within the Organic Statute at University of Costa Rica.</p>	<p><a href="http://setimocongreso.ucr.ac.cr/node/129">http://setimocongreso.ucr.ac.cr/node/129</a></p>
<p>QA-13 / Curricular flexibility by increasing access to academic offerings at UCR.</p> <p><i>[Flexibilidad curricular por medio del incremento del acceso a la oferta académica de la UCR.]</i></p>	<p>Luis Felipe Aráuz, Carmela Velázquez y Marta Bustamante</p>	<p>Approved</p>	<p>This topic goes in direction of the importance of a diverse academic offer in terms of curricular design for every discipline, this to conceive a plan that within 10 years allows each study program to increase their Optative Courses up to a 10% of courses out of their total offer. It is interesting to realize that this motion was pretty tight in terms of voting to be accepted. (63 votes in favour, 45 votes against) According to the report, the debate got heated by those who were against this, mostly</p>	<p><a href="http://setimocongreso.ucr.ac.cr/node/273">http://setimocongreso.ucr.ac.cr/node/273</a></p>

			<p>because they were concern about the "administrative problem" this setup would cause. For them, to have students from other careers into their classes would only mean that potentially, those <i>alien</i> students not officially signed to their study field would be occupying the spot of other students who, because of their official affiliation to the discipline, should have more chances that finding the topic just as an optional class they are curious about. By the other hand, those who supported the proposal thought of it as a great platform and opportunity for the students to experience an educational setup close to the humanistic approach, thus widening their formative process in conjunction with other disciplines different to theirs.</p>	
<p>QA-38 / Creating inter-disciplinary careers at UCR's Western Campus and university regulations</p> <p><i>[Creación de las carreras interdisciplinarias en Sedes Regionales y la normativa universitaria.]</i></p>	<p>Susan Chen y Mónica Ramírez</p>	<p>Approved</p>	<p>Their presentation was envisioned after the experience at the UCR Pacific Campus. During previous years, they went under a process in order to create a new study program, <i>-Informática y Tecnología Multimedia-</i>, and to finally achieve their goal, an intricate sequence of actions came to be spotted. According to their experience, this is an evidence on how the administrative structure remains passive, trusting such processes to traditional mechanisms instead of untangling the bureaucratic burden otherwise implied, this in order to assist to the creation of interdisciplinary careers. Taking their case as example, it is shown that the current academic politics at UCR aren't as flexible to adapt to each campus contextual configuration, a challenge that gives origin to a major issue in terms of formalizing interdisciplinary careers and with it, the possibility to encourage knowledge production as a joined process between disciplines.</p>	<p><a href="http://setimocongreso.ucr.ac.cr/node/232">http://setimocongreso.ucr.ac.cr/node/232</a></p>
<p>EGH-2 / The future development of public education in regional campuses in the XXI century</p> <p><i>[El futuro del desarrollo de la educación pública en las regiones en el Siglo XXI.]</i></p>	<p>Julio Brenes y Alberto Cortés</p>	<p>Approved</p>	<p>In this presentation, a line of historical remarks is presented in order to understand the origins and development of the regional processes at Universidad de Costa Rica, specially because this phase was conceived under a hectic political context in Costa Rica during the 60s, time when decisions were taken under certain premises, and the figure of this institution was still prominent because of being the only higher education institution existing in the Costa Rican society. After 47</p>	<p><a href="http://setimocongreso.ucr.ac.cr/node/95">http://setimocongreso.ucr.ac.cr/node/95</a></p>

		<p>years, the context been faced is rather different taking in consideration the academic offer in general, the population growth, economical moment and institutional regulations and administration. Their proposal indicates that the most challenging problems present today in terms of regionalization refer to (1) the students enrollments' process at the different UCR campuses is not necessarily linked to a regional factor and its necessities in terms of higher education but to other factors such as the <i>Academic Aptitude Test</i>, and to economical limitations among others; (2) a strong centralized system that ties regional campuses decisions to whatever the situation is at the Rodrigo Facio Campus, as well problems in terms of joined study programs and new careers creation; (3) budget and administrative limitations; (4) limited development in terms of research and social outreach within certain campuses; (5) professorship, academic coordination and researchers budgets are insufficient to enhance labour mobility processes in campuses different to the Rodrigo Facio, (6) uneven decision making processes and participation of the academic body and (7) infrastructure and institution equipment improvements limitations. In order to find solutions, it is proposed that as institution we are in need to review the conceptualization on our campuses, as for the academic and disciplinary organization should take place. For this, there must be a joined and integral review of the Organic Statute and gradually to have a shared budget in equal conditions, having in mind that all of the different campuses at UCR must evolve into academic cities to support each different region. As well, the proposal highlights the importance of an initiative to pursue a national articulation program among all universities throughout the different regions, thus improve and guarantee a teaching offer quantitatively and qualitatively good. In short, it is crucial to create inter-institutional relations to work side by side in favour of regional development.</p>	
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## Annex 02



### Fieldnotes / Observation Card

<p><u>Campus:</u></p> <p><u>Course:</u></p> <p><u>Date / Starting time of the classmates:</u></p> <p><u>Number of participants:</u></p>
<p><u>Location schema of students and digital media being used among them.</u> <i>(location of educator, location of students, empty spots, location of digital media being actively and passively used)</i></p>
<p><u>Description of Setting:</u> <i>(reflective notes on the relation between teachers and students during a class, digital media withing the classroom)</i></p>

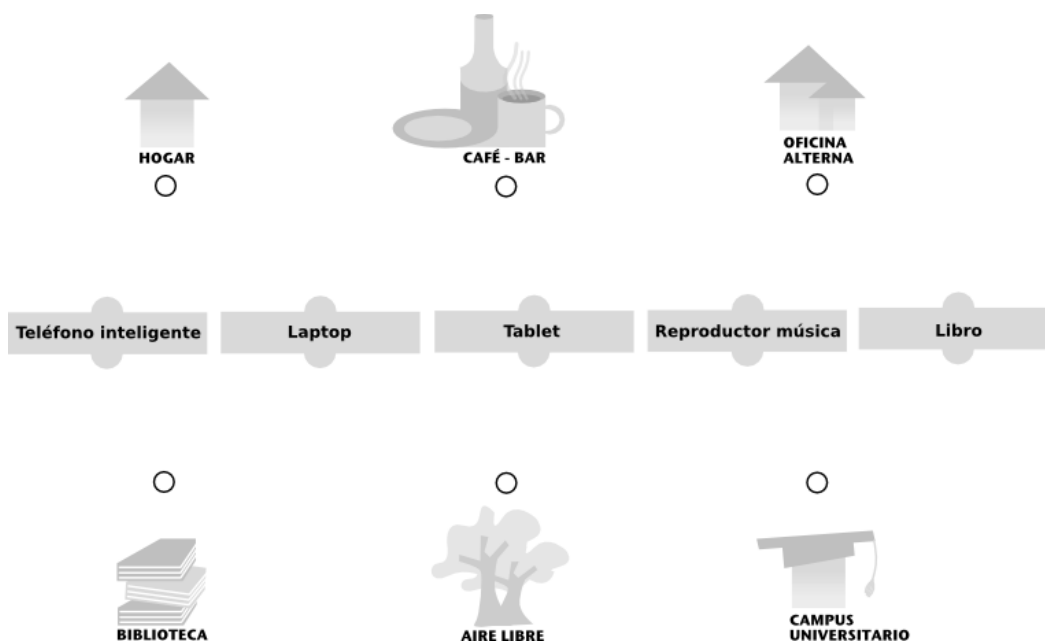
## Annex 03





16. Uso de herramientas para chat (de voz y de texto)										
17. Sitio web para compartir videos (youtube)										
18. Mensajería instantánea (Whatsapp, etc)										

3. En el siguiente diagrama, encontrará 5 cajas que contienen el nombre de diferentes herramientas. Utilizando líneas, **asocie las herramientas con las diferentes locaciones que se muestran alrededor. Puede asociar cada herramienta con todas las locaciones deseadas.**



4. ¿Dónde ocurre su interacción con otras personas? Identifique los diferentes espacios donde usted se vincula con otros y determine por medio de porcentajes la cantidad del tiempo en una semana que usted invierte en cada escenario.

En casa de sus padres	%
En residencia estudiantes	%
Universidad	%
Trabajo	%
Internet	%
Lugares al aire libre	%
Grupos especializados	%

Otros	%
<b>TOTAL</b>	<b>100%</b>

5. Describa el mejor espacio que le permite aprender con mayor facilidad. Puede comenzar mencionando una locación (*casa, parque, biblioteca, clase universitaria, etc*), un momento destacado durante el día (*mañana, tardes, madrugada, etc*), así como las condiciones (*en silencio, escuchando música, realizando otras acciones, comiendo, etc*).

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6. ¿Qué herramientas le resultan fundamentales durante sus procesos educativos?

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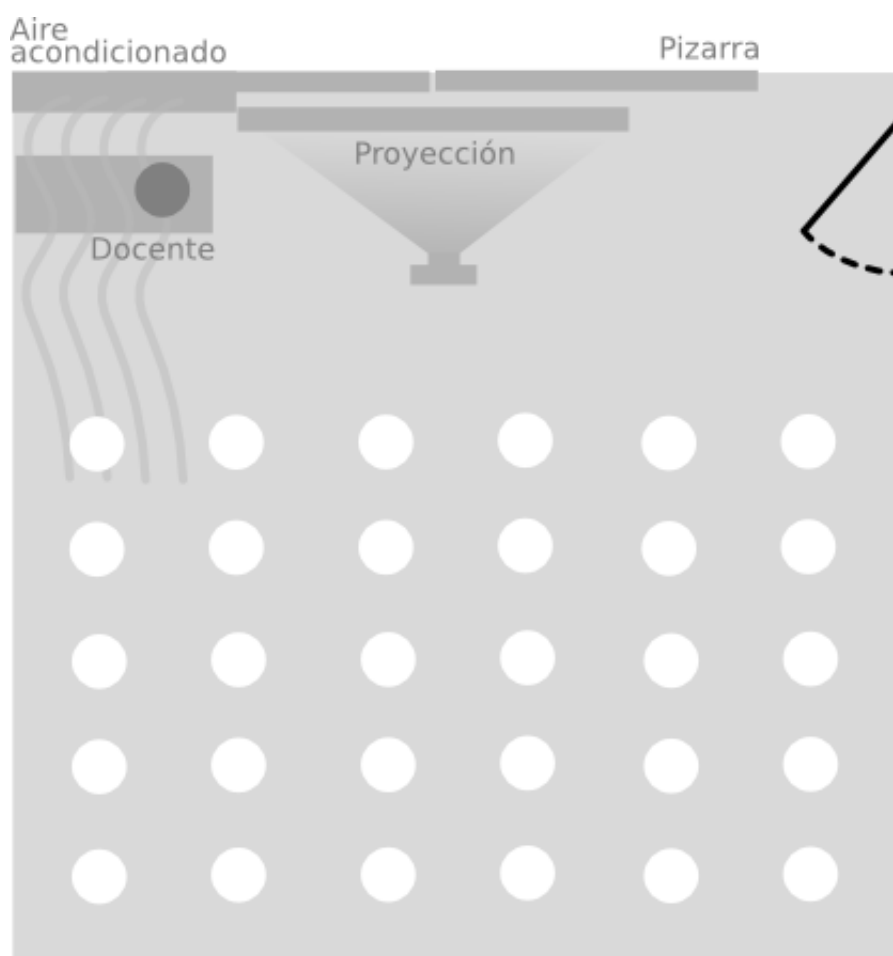


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7. En la siguiente configuración de una clase presencial, ¿cuál es habitualmente su ubicación?



8. ¿Responde ese posicionamiento a alguna razón en especial? Explique

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9. Durante una clase, ¿cuáles de los siguientes dispositivos utiliza y con qué frecuencia? Explique.

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Computadora personal					
Teléfono inteligente					
Video proyector					
Tableta					
Otros (indique):					

10. Durante una clase, ¿cuáles de los siguientes servicios utiliza y con qué frecuencia?

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Herramientas para edición de web blogs y wikis					
Plataformas educativas ( <i>Mediación Virtual, etc</i> )					
Servicios de almacenaje en la nube ( <i>Dropbox, etc</i> )					
Sitios web varios ( <i>Noticias, entretenimiento, etc</i> )					
Plataformas de presentación en-línea ( <i>Prezi, Slideshare, etc</i> )					
Bases de datos especializadas ( <i>Google Scholar, SIBDI, etc</i> )					
Redes sociales ( <i>Twitter, Facebook, etc</i> )					
Aplicaciones de mensajería instantánea ( <i>Whatsapp, etc</i> )					
Sitios de video ( <i>YouTube, Vimeo, etc</i> )					
Webmail ( <i>Gmail, Hotmail, etc</i> )					

11. ¿Cuáles son las razones por las cuales utiliza estos dispositivos y servicios durante una clase? Escoja las opciones necesarias que correspondan.

- ( ) Tareas solicitadas en la lección
- ( ) Iniciativa personal para complementar información que se discute en la clase
- ( ) Tareas varias no vinculadas a la lección
- ( ) Tomar notas de clase
- ( ) Redes sociales
- ( ) Otras razones:

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12. ¿Qué tan importante le resulta el uso de medios digitales en el espacio educativo?

- Muy importante
- Importante
- Normal
- Poco importante
- No tiene importancia alguna
- No se / No respondo

13. ¿Cuál es su edad? \_\_\_\_\_

MUCHAS GRACIAS POR SU COLABORACIÓN

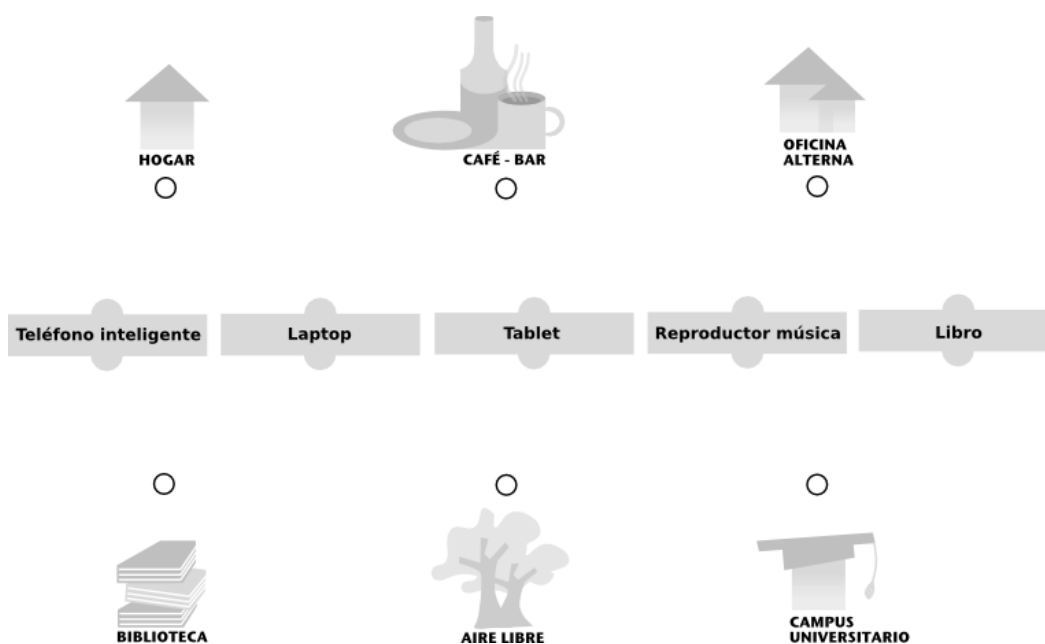






herramientas para chat (de voz y de texto)										
17. Sitio web para compartir videos (youtube)										
18. Mensajería instantánea (Whatsapp, etc)										

3. En el siguiente diagrama, encontrará 5 cajas que contienen el nombre de diferentes herramientas. Utilizando líneas, **asocie las herramientas con las diferentes locaciones que se muestran alrededor.** Puede asociar cada herramienta con todas las locaciones deseadas.



4. Durante una clase, ¿cuáles de los siguientes dispositivos utiliza y con qué frecuencia? Explique.

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Computadora personal					
Teléfono inteligente					
Video proyector					
Tableta					
Otros (indique):					

5. Durante una clase, ¿cuáles de los siguientes servicios utiliza y con qué frecuencia?

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Herramientas para edición de web blogs y wikis					
Plataformas educativas ( <i>Mediación Virtual, etc</i> )					
Servicios de almacenaje en la nube ( <i>Dropbox, etc</i> )					
Sitios web varios ( <i>Noticias, entretenimiento, etc</i> )					
Plataformas de presentación en-línea ( <i>Prezi, Slideshare, etc</i> )					
Bases de datos especializadas ( <i>Google Scholar, SIBDI, etc</i> )					
Redes sociales ( <i>Twitter, Facebook, etc</i> )					
Aplicaciones de mensajería instantánea ( <i>Whatsapp, etc</i> )					
Sitios de video ( <i>YouTube, Vimeo, etc</i> )					
Webmail ( <i>Gmail, Hotmail, etc</i> )					

6. ¿Cuáles son las razones por las cuales utiliza estos dispositivos y servicios durante una clase? Escoja las opciones necesarias que correspondan.

- Tareas previamente elaboradas para la clase
- Corroborar dudas
- Tareas varias no vinculadas a la lección
- Redes sociales
- Envío de mensajes de texto y/o mensajería instantánea
- Otras razones:

7. ¿Qué tan importante le resulta el uso de medios digitales en el espacio educativo?

- Muy importante
- Importante
- Normal
- Poco importante
- No tiene importancia alguna
- No se / No respondo

8. ¿Cuál es su edad? \_\_\_\_\_

MUCHAS GRACIAS POR SU COLABORACIÓN

## Annex 04

### Cuestionario para estudiantes de curso

Investigación doctoral "Perspectivas de la Docencia Universitaria en Tiempos de Medios Digitales en la Universidad de Costa Rica", inscrita en la Universidad de Bremen a cargo del investigador Danny Barrantes Acuña

Estimada(o) participante,  
 Este cuestionario forma parte de una investigación cualitativa que busca *comprender el proceso educativo universitario en la relación que mantiene con el campo de los medios digitales*, ello para enriquecer la labor académica de la Universidad de Costa Rica (UCR). Esta parte de la investigación toma lugar durante los meses de marzo, abril y mayo de 2014 en las sedes de la UCR ubicadas en Puntarenas, San Ramón y San Pedro de Montes de Oca donde se analizan los datos de tres diferentes programas de estudio en diferentes contextos. **El cuestionario es de carácter anónimo, y la información será utilizada estrictamente para los fines académicos.**

1. Indique la frecuencia y el grado de conocimiento que usted tiene sobre el uso de los siguientes dispositivos.

Dispositivos	Grado de Conocimiento					Frecuencia de uso				
	Avanzado	Medio	Básico	Ningún	NS/NR	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
1. Computadora de escritorio		X						X		
2. Computadora portátil	X					X				
3. DVD player		X						X		
4. Scanner				X					X	
5. Cámara fotografía digital			X					X		
6. eReader (ej. Kindle, Nook)				X					X	
7. Teléfono celular	X					X				
8. Teléfono inteligente (smartphone)	X					X				
9. Reproductor de música (ej. Ipod)	X					X				
10. Tablets (ej. iPad)			X					X		
11. Phablets				X					X	
12. Radio	X					X				
13. Televisión	X					X				
14. Consola de videojuegos						X				
15. Reproductor de videos	X					X				

Call of Duty  
 nivel Dios  


Jodo tiempo

10. Durante una clase, ¿cuáles de los siguientes servicios utiliza y con qué frecuencia?

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Herramientas para edición de web blogs y wikis			X		
Plataformas educativas (Mediación Virtual, etc)	X				
Servicios de almacenaje en la nube (Dropbox, etc)		X			
Sitios web varios (Noticias, entretenimiento, etc)	X				
Plataformas en-línea (Prezi, Slideshare, etc)			X		
Bases de datos especializadas (Google Scholar, SIBDI, etc)	X				
Redes sociales (Twitter, Facebook, etc)	X				
Aplicaciones de mensajería instantánea (Whatsapp, etc)	X				
Sitios de vídeo (YouTube, Vimeo, etc)	X				
Webmail (Gmail, Hotmail, etc)	X				

11. ¿Cuáles son las razones por las cuales utiliza estos dispositivos y servicios durante una clase? Escoja las opciones necesarias que correspondan.

- Tareas solicitadas en la lección
- Iniciativa personal para complementar información que se discute en la clase
- Tareas varias no vinculadas a la lección
- Tomar notas de clase
- Redes sociales
- Otras razones: -o relajarseeee

12. ¿Qué tan importante le resulta el uso de medios digitales en el espacio educativo?

- Muy importante
- Importante
- Normal
- Poco importante
- No tiene importancia alguna
- No se / No respondo

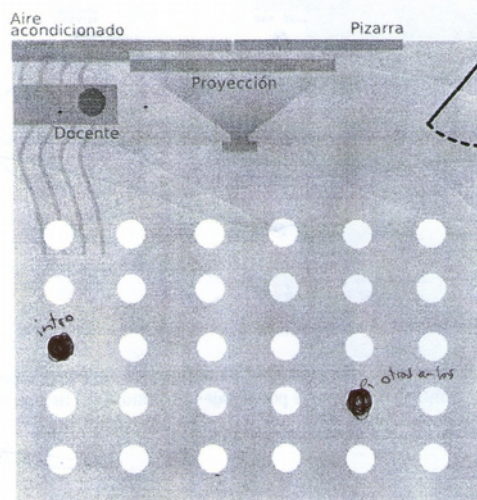
13. ¿Cuál es su edad? 17

MUCHAS GRACIAS POR SU COLABORACIÓN

6. ¿Qué herramientas le resultan fundamentales durante sus procesos educativos?

La computadora, lapiz y Cuadrino, el aire acondicionado, el video bin

7. En la siguiente configuración de una clase presencial, ¿cuál es habitualmente su ubicación?



8. ¿Responde ese posicionamiento a alguna razón en especial? Explique

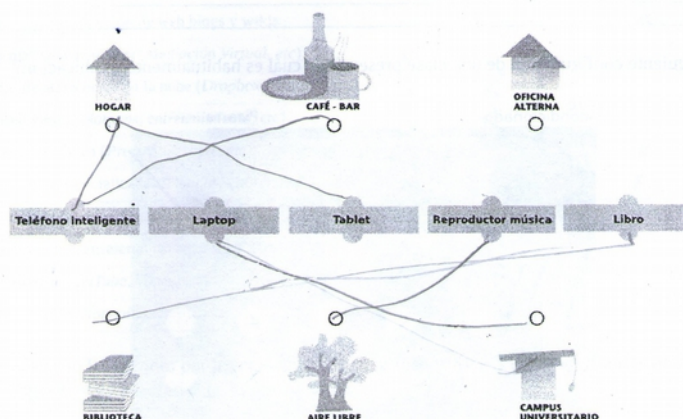
En introducción por el aire acondicionado.

9. Durante una clase, ¿cuáles de los siguientes dispositivos utiliza y con qué frecuencia?

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Computadora personal		X			
Teléfono inteligente			X	X	
Reproductor de música				X	
Tableta				X	
Otros (indique):					



3. En el siguiente diagrama, encontrará 5 cajas que contienen el nombre de diferentes herramientas. Utilizando líneas, asocie las herramientas con las diferentes locaciones que se muestran alrededor. Puede asociar cada herramienta con todas las locaciones deseadas.



4. ¿Dónde ocurre su interacción con otras personas? Identifique los diferentes espacios donde usted se vincula con otros y determine por medio de porcentajes la cantidad del tiempo en una semana que usted invierte en cada escenario.

En casa de sus padres	15	%
En residencia estudiantil	0	%
Universidad	70	%
Trabajo	0	%
Internet	10	%
Lugares al aire libre	5	%
Grupos especializados	0	%
Otros	0	%
<b>TOTAL</b>	<b>100</b>	<b>%</b>

5. Describa el mejor espacio que le permite aprender con mayor facilidad. Puede comenzar mencionando una locación (casa, parque, biblioteca, clase universitaria, etc), un momento destacado durante el día (mañana, tardes, madrugada, etc), así como las condiciones (en silencio, escuchando música, realizando otras acciones, comiendo, etc).

Las mejores condiciones para mí son en mi casa con un abanico en el computador en los días y en silencio, pero preferiblemente en parques.



10. Durante una clase, ¿cuáles de los siguientes servicios utiliza y con qué frecuencia?

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Herramientas para edición de web blogs y wikis	<input checked="" type="checkbox"/>				
Plataformas educativas ( <i>Mediación Virtual, etc</i> )		<input checked="" type="checkbox"/>			
Servicios de almacenaje en la nube ( <i>Dropbox, etc</i> )		<input checked="" type="checkbox"/>			
Sitios web varios ( <i>Noticias, entretenimiento, etc</i> )		<input checked="" type="checkbox"/>			
Plataformas en-línea ( <i>Prezi, Slideshare, etc</i> )			<input checked="" type="checkbox"/>		
Bases de datos especializadas ( <i>Google Scholar, SIBDI, etc</i> )			<input checked="" type="checkbox"/>		
Redes sociales ( <i>Twitter, Facebook, etc</i> )				<input checked="" type="checkbox"/>	
Aplicaciones de mensajería instantánea ( <i>Whatsapp, etc</i> )	<input checked="" type="checkbox"/>				
Sitios de video ( <i>YouTube, Vimeo, etc</i> )	<input checked="" type="checkbox"/>				
Webmail ( <i>Gmail, Hotmail, etc</i> )	<input checked="" type="checkbox"/>				

11. ¿Cuáles son las razones por las cuales utiliza estos dispositivos y servicios durante una clase? Escoja las opciones necesarias que correspondan.

- Tareas solicitadas en la lección
- Iniciativa personal para complementar información que se discute en la clase
- Tareas varias no vinculadas a la lección
- Tomar notas de clase
- Redes sociales
- Otras razones:

*Despejarse un poquito*

12. ¿Qué tan importante le resulta el uso de medios digitales en el espacio educativo?

- Muy importante
- Importante
- Normal
- Poco importante
- No tiene importancia alguna
- No se / No respondo

13. ¿Cuál es su edad? 24

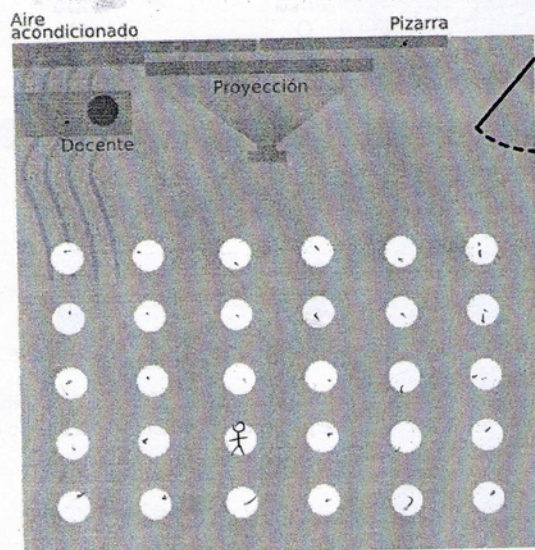
MUCHAS GRACIAS POR SU COLABORACIÓN

*Gracias a usted por quitarme tiempo a la clase.*

6. ¿Qué herramientas le resultan fundamentales durante sus procesos educativos?

Laptop  
Cuaderno  
Lapiceros colores

7. En la siguiente configuración de una clase presencial, ¿cuál es habitualmente su ubicación?



8. ¿Responde ese posicionamiento a alguna razón en especial? Explique

No

9. Durante una clase, ¿cuáles de los siguientes dispositivos utiliza y con qué frecuencia?

	Muy frecuente	Frecuente	Poco frecuente	Nunca	NS/NR
Computadora personal			-		
Teléfono inteligente	-		-		
Reproductor de música				-	
Tableta					
Otros (indique):					-