Teaching in Action!

Comparative research into the pedagogical environments of the HPS faculties in Bologna and Utrecht

Anne Rosier
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Supervisor: Professor Baneke (Universiteit Utrecht)
Second supervisor: Professoressa Spallanzani (Università di Bologna)

"Nessuno nasce imparato."[1]

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[1] Italian proverb – nobody is born learned

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Abstract

In a position paper, published last year, leading men of initiative *Science in Transition* voice their opinions on the current state of the scientific system in The Netherlands. Changes that have been occurring, since the seventeenth century, they argue, in the relation between Science and Society have had a significant effect on the university. The organization, financing, and responsibility of the scientific enterprise have become more problematic. One should ask him- or herself, the writers argue, whether or not the enterprise is still organized to our satisfaction. Similar voices have been heard in Italy; students have been taking to the streets to protest university reforms and government spending. In light of the 2015 Milan Expo, a large amount of citizens seems to have grown dissatisfied with government spending as the amount of money spent on the Expo could have been used to improve student housing, university buildings and general living conditions in Italy.

One could argue that the systems of education have become closed communities: efficiently - yet not necessarily optimally- working machines with inputs and outputs that are acceptable but not, necessarily, desirable networks of various actors: teachers, students, researchers, curriculum, universities and technology that construct their own facts and leave little room for actual progress or change. I would like to argue that to be able to analyze the inner-workings of the university, we should try and open the, what could be considered, *black boxes* of education. I have, therefore, used a sociological approach similar to the ones employed by Sharon Traweek and Bruno Latour in their research of scientific communities. I have conducted comparative research into History and Philosophy of Science education at the Universities of Bologna and Utrecht and have analyzed the respective faculties' workplace, the staff's and students' use of technology and the available libraries, university museums and research facilities. I have, furthermore, observed and analyzed the routine exchanges, meetings, and gestures between students and university staff and the way in which these minutiae are constitutive of the way in which knowledge is transferred. I have found that, even though, the minutiae might seem unimportant they are, in fact, helpful in analyzing the inner workings of a university system and the ways in which it produces knowledge.

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September 2014, Bologna

I think it is like having dinner at a friend's house for the first time. Everything seems odd. Everything seems off. The furniture is positioned in a weird way. The house smells different. Everything seems quite inefficient. Why is music playing during dinner? Why is the cat walking under the table? My friend's dad is making strange jokes – the ones my dad makes are funnier. My friend's mom seems sweet – but mine is sweeter. Why are we not getting desert? At a friend's house everything seems far from home, even when it's just two blocks away. At a friend's house everything seems to take time to adjust. Some might end up liking their friend's place, others might end up making excuses to be able go home sooner. At a friend's house it takes some time to adjust.

Now picture having dinner at an <u>Italian</u> friend's house for the first time; it is a whole new ball game I can tell you. Not only does the house smell different, the color of the walls is different. Everybody seems to speak louder and more passionately on every possible topic. A seemingly endless amount of food is supplied. The dad is making jokes that you do not quite understand. The mom never sits down. She walks around, constantly; making sure everybody has food on their plates. As soon as you try to make a point, people interrupt you [only later you will learn that this is, actually, a compliment]. At the end of the dinner Limoncello is served. Then coffee. Then Limoncello again. Through the window, the summer air streams into the kitchen. Everything is different at a friend's house; it takes some time to adjust.[2]

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[2] Obviously, I heavily rely on personal experience here. In no way am I trying to put forward the idea that these situations present themselves as such, to everybody, at all times.

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Keeping the spirit alive!

In a paper written by Kenji Ito, named *The Geist in the Institute: The Production of Quantum Physics in 1930s Japan[3]*, it is argued, through the example of the introduction of quantum mechanics – or the 'Kopenhager Geist der Quantentheorie' as phrased by Werner Heisenberg - in Japan, that the often used and just as often disputed metaphor of the 'spirit' as the conveyor of scientific knowledge and skills between different cultures ought to be rethought. It is a misrepresentation of reality to assume that a successful method can be transferred from one culture onto another.

In the article, what is understood as the 'Copenhagen spirit' is explained as a notion not unlike Harry Collins's notion of tacit knowledge. Collins, in his discussion of the transmission of experimental skills, defined tacit knowledge as a "skill-like knowledge, which travels best (or only) through accomplished practitioners."[4] He argued, furthermore, that it could not be "fully explicated or absolutely established,"[5] and that it is "invisible in its passage and in those who [possess] it."[6] If the 'Copenhagen Geist' would be what Collins considered 'tacit knowledge', it could prove to be the key to producing new theoretical physicists in Japan.

Through his analysis of the so-called Copenhagen spirit, Ito states that the concept or metaphor of the Spirit fails to explain historical process and argues that, instead, one should speak of a "resonance" of scientific practice. According to Ito, a resonance of scientific practice occurs "(…) not because the original set of practices was transported in its totality, but because certain social and cultural conditions allowed such a phenomenon to occur, and because some human or material meditation triggered a resonance of scientific practices."[7]

Ito's analysis of the so-called Copenhagen spirit and its introduction in Japan involves a quite detailed analysis of the Japanese university system as well as the way in which physicists and in this case, especially, Nishina Yoshio, were trained in quantum mechanics, in Copenhagen. He concludes that "(…) while physicists in Niels

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[3](Ito, 2002)
[4](Collins, 1985)
[5] Idem.
[6] Idem.
[7] (Ito, 2002, p.153)

Bohr's group and Japanese physicists, under Nishina's leadership, considered themselves imbued with the "Copenhagen spirit", their versions of the "Copenhagen spirit" had both similarities and differences."[8] Both research environments can be characterized by their ideal of collaboration, though Nishina's group realized little international collaboration in contrast to Bohr's group, in which internationalism was an integral part of both theory and practice.

In addition, both groups were managed by a single male leader as leadership played a crucial role in the group-dynamics. Though Bohr was a more subtle leader and Nishina more dictatorial both can be seen as paternal figures. Playfulness could be found in both groups, though the role of the respective leaders in the activities as a group differed from each other. While Bohr participated eagerly with his young students, Nishina tended to be more withdrawn and sober, though his physics students participated in activities in a similar way as Bohr's students did.

As such, the method, style and values recognized by Japanese physicists in the "Copenhagen spirit" contributed to the creation of a successful research environment of theoretical physics in Japan. They, furthermore, inspired a new generation of theoretical physicists to explore new issues, fields and problems. It would be wrong, however, Ito argues, to state that the 'Copenhagen spirit' was the only factor in establishing this successful research environment for theoretical physicists in Japan, nor would it be right to state that the 'Copenhagen spirit' was transferred by Nishina in its entirety: as a copy of the original.[9] The metaphor, therefore, falls short of portraying the reality of the transfer of skills and scientific activity.

It would be, similarly, incorrect to assume that a pedagogical environment can be transferred onto another culture much like "(…)a machine which can without further ado be transported from the West to any other part of the world there to continue its labors,"[10] In light of recent reforms in the landscape of higher education and the tendency of universities to try and gain a spot in the top university rankings through the transformation of their practice, in such a way that it complies with dominant and successful educational models, it is necessary to gain insight into the way a university functions: what contributes to its production of knowledge and in what way is it evaluated and valued? It would be naïve to assume that a dominant

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[8] (Ito, 2002, p.174)
[9] (Ito, 2002, p.175)
[10] (Ito, 2002, p.172)

teaching system that is valued highly by other countries can be transported, without problems, onto another country, culture or institute. I would, therefore, like to suggest exploring the seemingly different pedagogical environment as presented at the universities of Bologna and Utrecht and, specifically, as presented at their respective history and philosophy of science faculties, as to gain insight into their daily practices and, ultimately, into the way in which they produce knowledge. To do so, I propose to use a sociological approach in conducting qualitative research. One as used by, for example, Bruno Latour and Steve Woolgar in their famous 1979 book, *Laboratory Life: The Construction of Scientific Facts*[11].

In Laboratory Life, the two sociologists set out to investigate Roger Guillemin's laboratory in order to find out how scientific work is conducted. Taking the position of a researcher who is investigating a 'foreign tribe', Latour and Woolgar observe, that the way in which the daily activities of scientists and researchers are organized constitutes the construction of scientific facts. The scientific enterprise, they argue, is a complex system of different actors and their interactions. Theories that are too costly to change are referred to as 'reality'. These, so-called, 'well-established facts' would lose their meaning if they were taken out of context. Consequently, the credibility of a scientist is believed to be equal to his results and not to his reliability or integrity at work. This is illustrated by the overvaluation and over appreciation of CV's and publication counts. Yet, because of the relative success of the scientific enterprise, its inner workings are made invisible. The scientific enterprise has become, as Latour characterizes it, a 'black box'. He argues that, "(…) when a machine runs effectively, when a matter of fact is settled, one need focus only on its inputs and outputs, and not on its internal complexity. Thus, paradoxically, the more science and technology succeed the more opaque and obscure they become."[12]

In a similar way, Sharon Traweek sets out to study the community of energy physicists. In her book *Beamtimes and Lifetimes*[13], she analyzes the network of energy physics through the analysis of the actors' environment, spaces, artifacts, and roles. She, furthermore, studies their activities and their production of knowledge and evaluates the activities and research that are valued most by the scientists themselves. She argues that in the laboratories of the Stanford Linear Accelerator

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[11] (Latour & Woolgar, 1979)
[12] Idem.
[13] (Traweek, 1992)

Center, lab sites encourage some kinds of behavior and discourage others. The technology that is worked with can be used to retrace strategies for discovery. The natural events that are looked for by the physicists would be invisible without the technology at hand. In addition, the scientists themselves are trained to look at the world from a certain perspective. Their community is defined by a hierarchical structure of researchers, directors, and statesmen: all of who know exactly what paths to take - and not to take - in order for them to further their careers. Consequently, though the scientific enterprise prides itself with being cutting-edge and *on par* with ever-changing 'reality', the web of actors and their relations has made for an overall stability in the scientific community.

One could argue that the systems of education have become such closed communities: efficiently, yet not, necessarily, optimally, working machines with inputs and outputs that are acceptable but not, necessarily, desirable; networks of various actors - teachers, students, researchers, curriculum, materials, facilities and technology - that construct their own facts and leave little room for actual progress or change. It seems necessary to try and open these so-called *black boxes*, to make the identification and analysis of the inner-workings of education and university life possible. I have observed, for example, that the two faculties I would like to research, scienze filosofiche in Bologna and HPS in Utrecht seem to be focused on two radically different approaches. At the University of Bologna, history and philosophy of science students seem to be subjected to a classical lecturing system. The language of instruction is, without exception, Italian. Virtually, all teachers have been teaching for most of their lives. Becoming a professor is only possible if a position opens up through, for example, pension or illness. In Utrecht the main focus of the student's education is on a combination of lectures and Problem Based Learning. Students follow courses in Dutch and English and teachers vary in age and experience. Students are obliged to take written exams and are urged to take skills training in academic writing but spend less time analyzing original texts and treatises. It seems that both universities differ from one another, significantly, in teaching style and content.

Could universities be considered Traweek's communities or Latour's and Woolgar's laboratories? Efficiently working machines; self-sustaining networks of actors and techniques, limited to specific ways of producing (and re-producing)

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knowledge and products, in the form of publications, new teachers, researchers and students? By analyzing the workplace (such as: the university museum, library, classrooms, lecture halls, research labs); the technology and techniques used (such as: curriculum, exams, internet sites, digital tools); social influence and history (such as: government involvement, politics, the image of the university, history and tradition); and personal structure (such as: student-teacher relations, student relations [undergraduate/graduate/post-doc, etc.], teacher relations), I hope to get a better idea of what it is exactly that constitutes education and to understand what it takes to transfer skills and techniques. As such, I hope to find a balance between enchantment, and practicality; between the image of education, and the reality of education; between its meaning to the public and to those involved. By employing a sociologist approach as used by Latour, Woolgar and Traweek in my research of education I hope to gain more insight into the inner workings of the system of education and the role we could all have in its improvement.

Pedagogy and the Practice of Science

As David Kaiser argues in the introduction to *Pedagogy and the Practice of Science*[14] "Despite the centrality of pedagogical concerns to the modern scientific professions, scholars in science studies have not dedicated much systematic attention to the topic (…) even though pedagogy has been a major concern of the modern scientific professions."[15] He argues, furthermore that, similarly, historians and sociologists of education have stressed the fact that schooling and education should, hardly, be considered passive or neutral activities; decisions that are made regarding the types of content students should study or research and the skills they should acquire condition what is generally accepted as appropriate and acceptable pedagogy. In much the same way, related issues concerning labor supply and the financial considerations of institutions contribute to what is accepted as appropriate education. Scholars, however, have argued that there is more at work at higher education institutions than their formal subjects of instruction. Often, they serve as promoters of cultural, political and moral values, albeit different in effectiveness and subtlety. Kaiser argues

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[14] (Kaiser, 2005)
[15] Idem.

that students seem to be prepared for their role in society as 'good citizens', by learning how to forge identities that are deemed appropriate and fitting.[16] It should be clear, however, Kaiser argues, that what is accepted as appropriate or good - be it a citizen or a skill - always reflects active decisions and context. It is in the context of education, however, where intelligence, creativity and intellectuality meet politics and culture.

David Kaiser and colleague Andrew Warwick argue that it is, therefore, very surprising that hardly any literature has been produced in recent science studies on pedagogy, training and their influence – let alone on comparative research of higher education institutions across different countries. They find this absence all the more surprising since issues concerning pedagogy, training and education were already discussed in length by famous scholars such as Thomas Kuhn and Michel Foucault. [17] Kuhn, already, argued that "[S]cientific training is not just, or even primarily, a matter of teaching students the laws, principles, and concepts of their discipline and inculcating a spirit of critical and unbiased inquiry, but is rather a dogmatic and authoritarian process by which they are drilled through exercises to master the craft of the professional practitioner."[18] For one, the laws and principles of physics that are often believed to be applied in problem solving found no counterparts or definitions in textbooks studied by Kuhn. He, neither, found any other formal definitions of key concepts such as space, time and force. He observed, moreover, that many students who believed to have mastered the meaning of laws that were, indeed, defined in textbooks were often unable to solve end-of-the-chapter problems and assignments. Students did not overcome these difficulties by further studying the meaning of laws and concepts themselves but by studying canonical exemplars in order to come up with similar solutions to similar problems. This would imply that students applied the laws and concepts of physics through the knowledge they acquired in reproducing concrete problem solutions. Solution that were deemed correct in the specific community of physicists they were trained in; not through a stated set of rules written down in a textbook.

Consequently, Kuhn argues, the practice of studying physics is similar to mastering a craft skill and has little to do with simply understanding and accepting a

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[16] Idem.
[17] (Kaiser & Warwick, 2002)
[18] (Kaiser & Warwick, 2002; Kuhn, 1970)

set of pre-established rules and concepts. The purpose of working through examples and problems is twofold: it indicates the degree to which a student has understood crucial laws and definitions and generates these meanings through extended practice. In this way, research teaches students to see a problem as a variant on a problem they have already studied and successfully solved in the past. These skills guide the student in formulating common problem-solving techniques and would, ultimately, help in understanding, increasingly, difficult and novel issues. The popular view of the physical scientist worrying about inventions, excited about 'discoveries' and constantly testing major new theories is thereby disputed: Kuhn argues that the vast majority of physicists rather focuses on the expansion of the explanatory power of the theories anchored in the current paradigm – or so-called normal science.[19]

Though Kuhn delivers a detailed account of how progressive work within a scientific discipline takes place within a global disciplinary paradigm, he does not account for the manner in which the paradigm becomes global. He does not explain how canonical texts such as, for example, the *Principia* managed to bring together a group of likeminded practitioners and scientists, nor does he elaborate on the role or form of the training regimes in which these book were employed. As such, it remains unclear in what way training constitutes normal-science activity. Kuhn's account of scientific change as cyclical and timeless, furthermore, fails to, accurately, account for differences in acceleration in assessment and transmission of new works: many differences exist between the transformation following the Copernican revolution of the sixteenth and seventeenth centuries and the transformation brought about by Einstein's general theory of relativity, two and a half century later. Even though, it took almost a century for Copernicanism to become the established view of the heavens, the general theory of relativity was accepted by an international community of scholars little more than five years after publication. It was accepted as a part of undergraduate training at various universities (one of which was Cambridge) shortly after, whereas it took a long time for Copernicanism to be taught in technical detail to students.[20]

It is with the work of Michel Foucault, that Kaiser and Warwick believe to be able to complement Kuhn's view on the transfer of skills – more specifically, in the

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[19] (Kaiser & Warwick, 2002; Kuhn, 1970)
[20] (Kaiser & Warwick, 2002)

relationship Foucault poses between the human body and the exercise of 'power'. Because of the new approach to the human body as an 'object and target of power', Foucault argues, new disciplinary regimes in institutions emerged: the body was no longer treated 'wholesale', but rather individually "(…)exercising upon it a subtle coercion, of obtaining holds upon it at the level of the mechanism itself."[21]

Even though Foucault's focus lies, primarily, on the treatment of inmates in correctional facilities and not on students in higher education institutions, his discussion of important factors in disciplining and treating individuals is valuable. As he discusses the new disciplinary regimes installed in educational institutions in the late eighteenth century, he argues that the new disciplinary regimes should not simply involve 'making the inmate docile', i.e. coercion and subjugation, but should involve the search for those characteristics and capacities of the individual body that can best be enhanced and utilized. Though students at university should, in no way, be considered inmates Foucault's emphasis on enhancing and utilizing capacities is useful in understanding what it takes to apply discipline and inspire productivity. He argues, namely, that by focusing on the valuable capacities and aptitudes of individual bodies, discipline is constituted: "(…) a positive economy of accelerating and enhancing the productive capacity of the student."[22] In addition, Foucault argues, time ought to be organized by the disciplinary regime, as to extract an increasing amount of available moments.

In contrast to the traditional learning by guild apprenticeships, furthermore, Foucault argues, students' instruction in the new pedagogy of the late eighteenth century ought to reflect the useful forces and the manipulation of the student body. In the new institutions, he argues, groups of students were made according to age, ability and level of attainment, with group-specific exercises that were judged on having an appropriate level of difficulty. Education, or the training of students, was progressive - for students to move on to a higher level they had to have managed to pass the lower levels leading up to the new level. The responsibility of the teachers, consequently, lay in pedagogical (re-)organization and decision-making in which subjects, methods and exercises were to be taught by finding a balance between their students' individual capacities, their daily routine and their specialties. The examination of students

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[21] (Foucault, 1977; Kaiser & Warwick, 2002)
[22] (Foucault, 1970, 1977; Kaiser & Warwick, 2002)

functioned as the device with which teachers were able to supervise, qualify, classify, reward and punish. It reflected the skills that students were expected to learn; the performance necessary to move up in scale and a comparative measure of individual and relative abilities. The accumulation of exams provided the students with individual case histories which could be used in the future to assess their capacities, efforts, strengths and weaknesses. Individual performance as such, could be properly assessed by the instructor who, on the basis of a student's case history, could decide to advise repetition of lessons or specific techniques. Through the device of examination the ultimate capacity of a student could, therefore, be enhanced within a specific pedagogical context.

As such, even though Foucault deals, primarily, with the organization of correctional facilities and their inmates, his views on how an individual can be trained, by focusing on his or her specific abilities and talents, is valuable in discussing how the individual and the institute are involved in the transfer of skill. The transfer of skill, Foucault argues, should not rely solely on coercion and control but, rather, on developing discipline through the increase of individual productive capacity. His concept of the ideal disciplinary institutions and his analysis of the transfer of knowledge, with regards to the body and mind, therefore, offer insight into his view on the development of individual skills and abilities. Consequently, his concept of discipline, when put into a more general context, offers new ways of looking at individuals in the midst of their training or learning process.

It should be noted that, while Kuhn emphasizes the result of pedagogical training, Foucault seems to focus on the process of training itself. As such, he draws attention to the complexity and power of students' training. Moreover, though Kuhn values instruction as an unchanging medium of interaction between students and canonical texts, Foucault characterizes it as a very powerful means of historical change. In Kuhn's account of science as cycles of normal and revolutionary development, hardly any relation to training in different cultures or times is considered, whereas Foucault argues for a strong relationship between the history of education and available agreement achievable in disciplinary regimes. While it is, therefore, tempting to assume that Foucault's view on training complements Kuhn's, a number of obstacles should be kept in mind; though Foucault delivers a compelling theory on the relationship between training and the production of knowledge, the

relationship between student and instructor remains a bit of a problem. Because of his heavy reliance on concepts such as surveillance and inmates, his teacher remains 'the knower': as he manipulates the student's behavior and productivity for his own purposes, no place is left for the actual reproduction of the teacher's skills in the students – in order for this reproduction to take place, students must be able to have an active part in their education and, therefore, cannot remain mere passive inmates left in the hands of their master.[23]

Though this is hardly all there is to say about Kuhn and Foucault's philosophy regarding pedagogy and training, their views do prove very interesting examples of pedagogical training as an essential field through which scientific knowledge can be studied. The argument made by Warwick and Kaiser that to be able to historicize training's place in the sciences Kuhn's cyclical and timeless model of scientific change should be transcended proves even more interesting. Warwick and Kaiser stress the compatibility of Kuhn's emphasis on acquired skill and Foucault's argument on power in the form of social relations as necessary to knowledge production. They, furthermore, emphasize that Foucault's notion of every day training practices as crucial to the generation of capabilities in individuals is a notion that should be further built on. Though I do not intend to write my thesis on the specific details of Kuhn or Foucault's views on pedagogy, they do provide a very welcome and relevant framework for current debate on the organization of education. The importance of comparative research necessary for the understanding of education systems resonates in Kaiser and Warwick's call for a model of scientific change that recognizes history and social relationships as fundamental elements in the study of pedagogy and training throughout time and across different countries. By comparing different disciplinary regimes and training-systems we might be able to reach the core of what connects different institutions in their production of knowledge: pedagogical training.[24]

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[23] (Kaiser & Warwick, 2002)
[24] Idem.

Monday morning, Bologna

8.40. Via Zamboni is filled with students rushing to class. I hastily try to push past the people selling internet deals in front of the faculty buildings. I avoid the group of homeless people that has placed itself on the steps, around the corner. It is there every week. So is its smell of beer and cigarettes. I find the faculty I'm supposed to have class in at nine. Its door looks exactly like all other faculty doors

8.50. After asking for information at the front desk, I find my way to the classroom. It is situated directly next to the entrance. I carefully push open the heavy door, scared of interrupting the class that must have already started, or, at least, is about to. In front of the classroom, two Italians students are seated on a wooden bench. The classroom is empty. The lights are on, the chairs in disorder. No professor, no students.

9.00. After sitting nervously in my chair for about ten minutes, students start to seep into the classroom. They look surprised I am already sitting down. They chat, take seats in the front row, take out their phones and breakfast, and wait. I start to wonder whether or not I am in the right class.

9.05. The professor walks in. He mumbles "Buongiorno tutti.", sits down at his desk and takes out his books. He attempts to start the computer and his PowerPoint. The screen is not working. From a door that I had not seen, initially, on the other side of the room, a large Italian man walks in. He mumbles "Salve." and asks "Non funziona?" upon which the professor nods. The man silently fixes the screen by pressing a button on the wall and walks away without saying anything. The professor, without looking up from his desk, mumbles "Grazie". The students have taken out their books and are sitting quietly at their desks.

9.10. Class is in session. The professor has started summarizing previous lectures.

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I will now elaborate shortly on the technical details of education at the University of Bologna and discuss its structure, its subdivisions, its campuses and the way in which studies are organized. This is necessary, primarily, to clarify some concepts and terms that might be used differently in other institutes and context and is useful, furthermore, in placing the scienze filosofiche faculty within the context of the University of Bologna as a whole. Terms such as 'scuola', and 'laurea magistrale', relevant concepts in understanding HPS education in Bologna, will be, sufficiently, clarified. In my discussion of the scienze filosofiche program, specifically, I will shortly discuss its history, its organization and what is, formally, expected from its students.
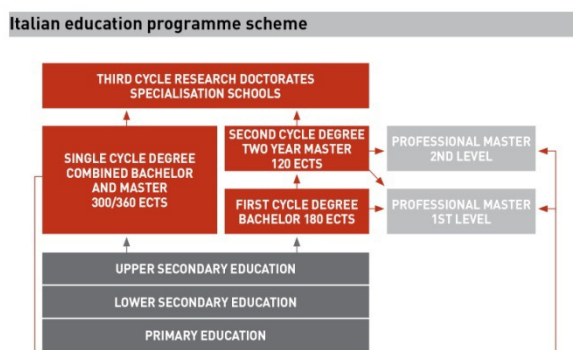
In the centre of Bologna, the Basilica di San Petronio welcomes tourists, art students and students of history, locals, the homeless and many others. Seated at piazza maggiore, they write, draw, have a beer or wait in line for the impressive church to open its doors. Only a few steps away, the age old city library *Sala Borsa* and the impressive fountain of Neptune await the same crowd; between them, two monuments remind by passers of the fascist attacks in 1980 and the fallen Italians who fought for the Resistance in the Second World War. Though its city centre has been modernized, significantly, in recent years, Bologna does not seem to have lost the well-preserved historical centre it is famed for - thanks to its seventies' policy of restoration and conservation.

The University of Bologna, contrary to what its name suggests, cannot be found in one building. Many tourists have trouble finding an answer to the popular question "Dov'è l'università?"[25], since there is none: the university lacks a centre, a campus, a designated 'mother building' central to all faculties. Instead, scattered around Bologna, different buildings belonging to different faculties have been constructed. Every faculty building has its own door number and front office. In addition, the university has campuses in Cesena, Forlì, Ravenna, Rimini and Buenos Aires. In total, the campuses of Bologna, Cesena, Forlì, Ravenna and Rimini take up 1086134.88 m2 and consist of 11 'scuole', or institutions, and 33 departments. In the scuole, departments and disciplines that overlap or complement each other are united. The departments are subdivided into 5 areas of expertise: the scientific, medical, technological, social and humanistic areas; every department offers an amount of degree programs.

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[25] *Where is the university?*

In compliance with the Bologna Process in 1999, the 2+3, bachelor/master system has been adopted in Italian higher education, replacing the old system of laurea and diploma. In practice, this means that education is structured through a first level degree, called the 'laurea triennale' that can be achieved in three years of studies and the 'laurea magistrale', an additional two years of specialization that students can choose after completing their triennale. The laurea triennale can be considered the equivalent of a Bachelor Degree, whereas the laurea magistrale is, arguably, the equivalent of a Master Degree. Only with a Laurea Magistrale can a student enter into a third cycle program – doctorates or further specialization schools. Some faculties, however, such as, for example, the faculty of Law, Arts and Music employ a unique 5 year degree called 'laurea magistrale quinquennale'. It is important to note that, next to the laurea magistrale, Italian 'Masters' exist; these masters are one-year specialist courses focused on giving students additional practical education.

Upon graduation all graduates, regardless of the faculty they graduated from, are rewarded the title 'dottore', which should not be confused with a PhD doctor-title. It can best be compared to the qualification of Master of Science and Master of Arts.

Italian education programme scheme

The laurea magistrale of Scienze Filosofiche is a two year specialization for students who hold a bachelor degree. It belongs to the Scuola di Lettere e Beni Culturali that was founded as a result of the union of the ex-faculty of Lettere e Filosofia and the faculty of Conservazione dei Beni Culturali, inheriting all courses belonging to both. It can be traced back as far as the union of Italy in 1861 as it was, originally, part of

the faculty filologico-letterario that took the place of the theological faculty of the Pontifical University. As the program is interdisciplinary and faculty buildings can be found all throughout the city, students might have a hard time locating the right building. In most cases, however, classes are taught in one of the buildings at Via Zamboni, a street popular for its vicinity to little coffee places and bars, its big Piazza Verdi square and the regular group of homeless people in front of the university buildings that, every morning, tries to sell bikes, weed and whatnot.

Even within the buildings, new students – such as me – might have trouble finding the right classroom or administration. Buildings are big and filled with escalators, flights of stairs, libraries and a thousand, seemingly, identical doors, making it difficult to distinguish between classroom and professors' studios. After a while, however, the structure becomes clear and turns out to be very straight forward. Virtually every department has its own floor and administration offices of every department can be found close to one of the faculty buildings. Online, all faculty representatives are listed and the email correspondence with administration offices is remarkably fast. For scienze filosofiche students, even though, the program is interdisciplinary, one administration office and one faculty representative are available for all communication and possible questions – making it much easier to find and request information and/or help.

The program offers 53 courses of which, in the first year, students are obliged to choose and pass two courses of 12ects, 1 course of 6ects and either an additional two courses of 6ects or one of 12ects. They are, moreover, required to complete a B2 English language course. The rest of the credits can be obtained by the obliged extracurricular activity offered by the faculty, meaning that students are expected to attend seminars, conferences or take additional language courses. The extracurricular activities change often and are published on the faculty's page. It is the student's own responsibility to make sure to obtain the twelve extra credits needed to pass the first year – whether he or she does so by following an intensive conference of 12 credits, or three seminars of 4. In the second year, students are required to choose two courses worth 6 ECTS and, additionally, either a course of 12ects or another two courses of 6ects from a limited amount of classes. They are expected, moreover, to choose between an internship, a stay abroad, a seminar or skills writing course and an additional 12 credits worth of extracurricular activity as published on the university

website. If the students manage to do so, they will have obtained 102 ECTS before starting their final exam.

Workday

Traditionally, instruction at Italian universities or institutes is given in the form of lectures. Professors stand before large groups of students, depending on the subject they are teaching, agree on a bibliography and leave class as soon as the hour or two hours are finished. Although, in most cases, the amount of personal contact a professor has with his or her students depends on the individuals themselves it does not seem to be, particularly, encouraged by the university system. A student is always free to request additional help when topics are unclear or examination has proven too difficult but, in general, organization and preparation fall on the student's shoulders alone.[26] This is illustrated, nicely, by the fact that both students and professors address each other with the formal 'Lei', initially. Students are allowed to use a large amount of abstracts, notes and printed lectures in the preparation of their exams. It is not uncommon for a professor to hand out copies of all slides used in classes to his or her students at the end of the course or at the end of the semester.

In general, professors teach one or two courses, with classes meeting three or four times a week. Traditionally, the aim of a class is not to teach students a variety of related topics but rather to try and teach a 'method of inquiry' through the study of a selected specialized subject. It is, therefore, often the case that a professor's current research becomes the essence of his course in a particular year, while in following year the course content could, very possibly, be different. In addition to their course work professors are, moreover, expected to spend a considerable amount of time administering examinations at their own university as well as outside of it, functioning as supervisors of state exams for secondary schools and university positions. In addition to regular courses, they lead a certain amount of seminars and conferences which are often overcrowded because of the high student attendance rate.

Days at university are traditionally divided in two hour slots that follow up on each other without breaks. Typically, the first slot starts at 9 and finishes at 11. The following slot start at 11 and finishes at 1 o'clock. This continues until 7 o'clock PM,

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[26](R.C. Simonini, 1954/1955)

when most classes finish. Though all schedules are published before the academic year starts, students are warranted to regularly check the course site as changes often occur. Additionally, overlap of classes is not uncommon, due to the amount of students attending university; some classes are scheduled at the same time. However, since students are not officially obliged to attend classes[27], students can choose to register for two classes scheduled at the same time and, either switch between classes, or attend classes of just one. As students are not obliged to register for classes, it is their own responsibility to arrive on time and piece together their personal class schedule. It is, however, necessary for students to register for exams – an issue that will be discussed in a following chapter.

Since not all students choose the same classes, students have a very personal schedule. Since, furthermore, they do not take all classes the curriculum offers; they seem to spend 4 to 6 hours a day, two or three days a week at university, in general. Consequently, no room for breaks is left between time slots; these too, are left to the students' responsibility. It becomes, somewhat, problematic, however, if students are attending classes that follow up on each other but are not taught in the same building. As mentioned before, the University of Bologna consists of many faculty buildings scattered around in the city. It often happens, therefore, that students need some time to get from one class to another. When they find themselves having back-to-back classes, being on time is, virtually, impossible. This problem has been solved through the creation of the 'quarto d'ora accademico'.

The 'quarto d'ora accademico', or what would translate into 'the academic 15 (minutes)', is something quite similar to the southern Dutch custom of the 'Limburgs kwartiertje': the socially accepted 15 minutes in which people can still arrive at a venue without being considered late – even though they technically are. This is a custom, moreover, that seems to be in use at some of the bigger Dutch universities, such as Leiden and Groningen but not at the HPS faculty in Utrecht. Due to the lack of a central campus, students and teachers, often, quite literally, have to run to get to their lectures on time. In some cases, the distance proves impossible to cover in the required amount of time, which, inevitably, leads to missed lectures or delay had the academic fifteen minutes not been called into existence. The 'quarto d'ora accademico' allows students and professor to reach an agreement on whether or not they choose to

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[27] (R.C. Simonini, 1954/1955)

make use of the extra time. Since the resolve has never been established as an official rule it is, in most cases, unclear at what time students are supposed to arrive to be considered on time: some professors do not accept the grey area at the beginning of their classes and expect their students to arrive at the time as officially registered in the class schedules - students arriving after are considered late. Others professors are more lenient and do allow students to arrive as late as fifteen to thirty minutes after the official start of classes, often holding off from teaching until, virtually, every student expected to attend class has arrived. In more cases than one, furthermore, professors are the ones in need of some extra minutes to arrive and get organized. In other cases, alternative ways of using the fifteen minutes are created. Students and professor might agree on ignoring the academic fifteen minutes, as well as the break, in order for them to finish thirty minutes early.

Although the fifteen minute buffer makes for a welcome solution to a practical problem, its unofficial character causes issues of a different kind: unknowing students wait in empty classrooms or in front of closed doors; students assuming to still get in 'on time' after rushing from one class to another, are no longer allowed to enter the classroom. In other situations, professors are unable to start class because students, unfamiliar with the agreement, keep interrupting class by arriving late. It seems to be known amongst students that the issue is, often, clarified at the beginning of every course. It is said to be crucial, therefore, to attend the first class of every course, since, in this class, students can find out where professors stand on the matter. Occasionally, professors who have been teaching the same courses for a couple of years have become known for their tolerance or intolerance of the academic fifteen minutes. In these cases, students know what to expect even before classes start because of the professor's reputation. Unfortunately, outsiders often seem unfamiliar with these practices and, since an official rule does not exist, arrive at university unprepared.

The average class consists of thirty students or more and seems to be attended, in general, by roughly half or three quarters of them. Students arrive in groups, chatting and sharing the last bits of food and drinks before class starts. Groups of students that have been taking classes in the same classroom, for some time, seem to have agreed on an informal classroom layout, in which members of the attending part of the class have been assigned a seat. During class, hardly anybody speaks. Because of the mentioned 'quarto accademico' students who take classes during or around

breakfast- or lunchtime often use the fifteen minutes in which the professor has not yet arrived to quickly grab lunch or breakfast. Pre-packed lunches and snacks, as the university offers no cafeteria or Mensa, are stalled out in front of them, next to the closed books that have been put on the table. Students seem to discuss a variety of topics ranging from homework, work and weekends while quickly eating their food and drinking from their water bottles. As soon as the professor arrives, however, the food is packed away, hastily; books are opened and eyes are fixated on the professor's desk. During class students are quiet. Most of them take notes in an almost machine-like fashion. Those who are not bent over their notebooks are typing away at their laptops or I-pads and contact between students is reserved for possible breaks and the end of class, only. As long as the professor speaks, everyone else is quiet – those who do decide to interrupt the lecture are, often, reprimanded by fellow-students before the professor even had a chance to jump in.

Professors

As faculties in Italy enjoy a significant amount of autonomy and universities, often, lack a central campus, the formation of strong individual faculties is made possible by a highly specialized curriculum and the scattering of independent department buildings.[28] Within the faculties little to no homogeneity exists, as the faculty's strength lies in its individual professors and working staff. The faculty personnel are, most of the time, assigned through competitive examinations requested by universities with a vacancy or institutions in need of supporting staff. Each year, an examining commission of five professors is selected at every institution by the official professors of each subject taught, to judge the qualifications of applicants looking for a university position. Candidates are expected to submit a publication and are, consequently, questioned orally. Some might be asked to give a small presentation. After the selection period, the examiners select three top candidates, the so-called *terna*, of which the best candidate gets to fill in the available position, while the remaining two candidates are held available for positions that might open up in the future. Professors working at one university can be asked to fill in a vacancy at another institute without

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[28] (R.C. Simonini, 1954/1955)

having to compete in an examination, provided they have the approval of the Ministry[29].

Instruction at the institutions is carried out by the official professors, or *professori di ruolo*, and professors-in-charge, *professori incaricati*. Official professors are professors who are nominated for a university position through a competitive examination, after which they will be *professori straordinari* for three years. If their scholarly activity and performance have been deemed satisfactory, they are promoted to *professori ordinario*, a title that implies continuous tenure. The 'professors in charge', however, are mostly young teachers who have not yet been nominated through competitive examination and are assigned from year to year by each individual institution. In addition, a number of assistants are assigned to help the official professors with the examinations, laboratory work, research, exercises, and other relevant academic work. Not every professor has an assistant assigned to them but those who want a job as a professor's assistant working in a specific field can apply through competition. Not all assistants and research assistants work for a salary: while some receive small compensation others work at the institution, on a voluntary basis. They, either, choose to do an internship or voluntary work that will help them gain experience while they wait for a university position to open up.

The road to travel for an aspirant, as is clear by now, is a very long and difficult one. Normally, a college graduate aspiring to be an official professor at a higher education institution will apply for a position at a small secondary school to gain some experience in the field. From that position he or she will try to move to either a bigger city or to a bigger secondary school, while preparing for a competitive examination in his or her field, through which he or she may possibly acquire a permanent position. The building of an academic reputation is, traditionally, done through the publication of as many articles and books as possible. Academic qualifications are to be judged in a national examination by a committee of professors working in a specific field. By passing this examination, the teacher is eligible for a temporary university post as a professore incaricato. Ultimately, the teacher will enter the mentioned competitive examination for a university chair, after which, if the professor has had significant success as a scholar, he or she might decide upon a final move and transfer to one of

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[29] (Soda, 1968)

the more distinguished institutions of Italy. In some cases professors might even choose to move abroad and end up taking up a teaching position there.

In interviews conducted with several professors, I asked for an explanation of the 'typical working day' of a professor. In many instances, this particular question was met with laughter. One professor explained that the typical working day of a professor does not exist and that it depends on every professor, individually, how many days and how many hours are spent at the university. All professors are expected to be in charge of at least one or two course modules a year. They have an educational commitment of 350 hours minimum annually, if they work full time, of which maximum 120 hours and minimum 60 hours are to be spent in front of class. Professors who have a part-time or adjusted contract are bound to 250 hours of teaching duties, of which 80 hours maximum and 60 hours minimum should be spent in class.[30] Hours spent in front of class involve teaching activities such as giving lectures, workshops, seminars, preparatory courses, remedial courses and honour programs on a laurea, laurea magistrale, and specializzazione and dottorato level.

All hours, furthermore, have to be registered and specified and the remaining hours are reserved for additional teaching duties, such as the supervision of exams; those in charge of a module are expected to be present at every single exam of to their course. Professors are, furthermore, expected to be involved in thesis advisement, the development of the curriculum and the annual staff meetings. In addition, professors are expected to hold hours of 'ricevimento'; these are specific hours, mostly two, reserved every week to receive students, colleagues and other interested parties with questions, requests or notices. The time of the ricevimento is published on the professor's personal website, as are any changes that are made in its time or location. All professors, moreover, have the right to conduct their own research or participate in research groups, provided that they are able to perform the teaching duties agreed to in their contract.[31]

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[30](unibo, 2013)
[31](NormAteneo, 2011)

Technology

Virtually all classrooms at the faculties are furnished in the same way: desks are positioned next to each other, in rows, from the front of the class to the back. In some cases, the space does not leave room for individual desks and students are seated at long tables that stretch from one side of the classroom to the other. In front of the class, the desk of the professor is positioned. On average, this desk seems bigger than the average student desk and is positioned in such a way that students can see it, regardless of their seat in the classroom. In addition to these regular classrooms, a few auditoriums are used for classes that are frequented by a high number of students. In these auditoriums, desks and seats are placed on an, increasingly, higher stand as to make sure every single student is able to hear and see the lecturer, regardless of their distance to the lecturer's desk. Since the amount of students supersedes the amount of professors available, in some instances, the professor may choose to use a microphone in order for him or her to reach the students who are seated in the back. In these cases, the distance between professor and student seems to be, ironically, emphasized even more: when students are given the opportunity to ask questions and they, for obvious reasons, do not have a microphone it seems very challenging to get a question or message across. The inability of students to freely speak their minds seems to work discouraging; in auditorium held classes, for example, a lot of students seem to wait till the end of class to pose their questions or choose to not ask their questions at all.

As additional support of their classes, some professors choose to use PowerPoint slides or schematic summaries drawn on the board. In most cases, however, lecturing involves all students bringing a copy of the book they are working on and the professor going through it by reading passages and commentaries aloud. In some cases, at the start of the semester, students are given hand outs or notes indicating what passages will be read in class. As such, the professor gives students a chance to show up at classes prepared and well read. After the professor's analysis of one passage, the class will move on to a different passage or to a different book or article and the routine will be repeated. At the end of the lecture, twenty minutes – or a different amount of time, if agreed upon - are reserved for questions and discussion. Even though, participation always depends on every individual and class dynamic, in most cases, time seems to run out before students have a chance to pose their questions. In other cases, students

who were hesitant during class decide not to bother after class and leave without approaching the professor. For those who do want to speak to the professor but feel they need more time, the hours of ricevimento are reserved.

As students are responsible for the purchase of their own books and have some freedom in choosing which literature to use, the materials used in class by students differ. Some students prefer to bring the actual books used or referred to in class to class, while others may choose to use abstracts, notes or voice recorders. At the beginning of the module, it is common for the professor to have prepared an outline or syllabus of the lectures that are given to the students; as such they are able to buy or otherwise acquire the necessary literature. In some cases the literature lists are published online, in advance. At the end of the module, the professor, at times, is prepared to share the slides and handouts used with the students who attended the classes. The slides are, either, downloaded on to a USB-stick which is entrusted to one of the students; shared on Drop box or downloaded onto individual USB-sticks brought by students who are in need of the slides. As students are frequently asked, on exams, about argumentation and commentaries discussed in class, these slides are of great value. It, moreover, allows students who did not attend classes regularly, to collect the information they were not able or willing to gather during the semester.

Even though, in recent years, a lot of changes seem to have been made in the use of technology by professors and students, most information is still distributed through paper flyers, posters or mouth to mouth advertisement. The halls of the faculty building are plastered with announcements on seminars and conferences, as are the bulletin boards next to the office doors of university professors. Announcements concerning hours of ricevimento, meetings or class schedules are, initially, transmitted through messages on the boards or in the entrance hall. One street close to the student square 'piazza Verdi' is, entirely, dedicated to the placing of flyers concerning room offers, housing opportunities, tutors, yoga classes, food workshops, language courses, upcoming parties, missing cats, protests and garage sales.

As for the distribution of information, the university's website is a source of news and seems to be updated, regularly. Graduates, students, future students, enterprises and staff can use it to access information on upcoming events, information evenings, alumni events, class schedules, seminars, and a short history of the

university. Divided into five general categories, namely University, Didactics, Research, Internationality and Services and Opportunities, web site visitors are granted easy access to numerous pages of information concerning the university and its place in Italian education. Additionally, it consists of a lot of references to other related sites such as the library catalogue, the university museum and NormAteneo - a site dedicated to all the norms and regulations implemented at the university. It, moreover, provides access to the individual sites of all individual departments. Each department has its own 'home website' in which further specifications of class schedules, upcoming seminars, conferences and course catalogues are made public.

Though, the site provides visitors with a lot of information, the English version, of some parts of the website, seems rather outdated. Upon first look, the information is the same; conferences that are promoted, the university's position in the world ranking and class schedules seem to have been translated quite accurately. Upon closer look, however, a lot of the information that is updated in Italian, such as faculty vacancies and research positions, has not been updated in English. The extensive descriptions given in Italian, furthermore, often seem to have been transformed in short, summary-like descriptions in English. In some cases, a lot of the information that is given on school regulations has not been translated at all. In much the same way, the English sites that are focused on tourism or the arrival of international students are not available in Italian. The site dedicated to the University Museum System, for example, is not available in Italian translation. Though it is understandable that the necessity of translating institutional regulations in English is not apparent, it does detract from the site's accuracy.

Student evaluations on professor's performance and course quality are submitted via paper surveys that are distributed, by student volunteers, passing by all classes to distribute the surveys. Filling in the survey takes about half an hour and is always done during class. As soon as everybody has handed in his or her evaluation, the student who distributed them collects them, seals them in an envelope which is signed by the professor in charge and hands them over to the university administration. The surveys consist of open and closed questions regarding specific classes and the general state of the university. Students are asked to evaluate class schedules, professors' teaching styles and teaching methods, the state of the university halls and the quality of the curriculum. Additionally, they are given the opportunity to

answer open questions about what they would like to improve about the university if they had the chance.

Examinations and thesis

Exams are almost exclusively oral. Students are expected to cover the entire course curriculum, which often involves reading and studying around 4 books, and should be able to discuss core issues and the argumentation as presented by the author. In addition, students are expected to be familiar with the line of reasoning as presented by the professor during the course, which means that students should be able to recall the professor's analysis and ought to be able to answer questions answered in class, using well formulated arguments. In theory, the emphasis on oral exams stems from the suspicion that written exams allow students to cheat.[32]

Students are required to register for exams online. Only if a student is registered online for an exam can his or her grade be registered, officially. Specific registration periods are opened a couple of weeks before the exams take place. It is within these periods a student has the chance to register for the exam. In most cases, the order in which students have registered is the order in which the students are asked into the examination room. With hundreds of students taking the same exam it is, therefore, key to register within the first minutes after the registration period is officially opened, if a student would like to avoid waiting in the university hall for, sometimes, more than six hours.

For students who did not attend a sufficient amount of classes, additional literature is listed on the course site to be studied for the exam specifically: these students are, as such, given a chance to compensate for their lack of attendance by studying the extra literature related to the course content. Whether or not a student has attended a sufficient amount of classes is, most of the time, up to the students themselves to decide. Some professors ask students at the start of the exam whether or not they attended classes but if a student is under the impression that he or she will be able to answer enough questions at the exam to pass but fails to do so in the end, this is on account of his or her own decision.

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[32](R.C. Simonini, 1954/1955)

Though rules on class-attendance are, often, unclear, officially it is stated that students are not obliged to partake in classes or lectures. They are judged on their ability to pass the final exam and any partial exams that are to be held throughout the course. In theory, this means that students can go through their entire university experience without ever attending any classes. In fact, there are students who are registered 'fuori sede', meaning they are part-time students who are expected to only be present at exams. As the official rule regarding class attendance states that attendance is not obligatory, students cannot be failed for not being present at course lectures. In reality, however, the attendance or non-attendance of students seems to be taken into account by most professors. Most professors seem to decide for themselves, to what extent the attendance rule applies.

Though official rules are supposed to prevent favouritism, it is known amongst students that exam results are, indeed, and virtually always, influenced by the impression left on individual professors. Because the size of most classes prevents professors from knowing or recognizing every student individually, it is known that those who stand out from the crowd are remembered fairly easy and that this recognition can work in different ways. For those students who are remembered for their impeccable attendance, their punctuality, their seat in the front row and class participation, a professor recognizing them at the final examination can work out well. For others, however, remembered for their absence, their tardiness and passiveness or for their ability to show up only when important information is supposed to be handed out, professors' recognition might turn out to be unfortunate.

Consequently, at the start of a new period of classes, students inform themselves of their future professors, by asking other, experienced students what they can expect. Though, officially, students are not obliged to attend classes and attendance therefore should not affect performance, it is clear that contrary to official regulation, attendance does indeed influence students' final results. Not only does it influence grades and performance evaluation, in a surprisingly direct way, it influences a student's future. When asked how students were supposed to find jobs after graduation, almost all replied that the best way to find a job was through the recommendation of a professor. Italy, as many other countries in Europe, is sighing under the weight of the economic crisis, and jobs are scarce. The number of students attending university, moreover, is many times larger than the amount of job positions

available after graduation. The best shot a student has at finding work immediately after graduation, is through the help of a professor. As many professors are part of a large network of potential employers, top students have a chance at a personal recommendation of one of their professors. Sometimes, professors in need of research assistants, personal assistants, or other employers might offer the student a position themselves. Those who go by unnoticed, therefore, have a significantly smaller chance at a recommendation or job offer.

In recent years, some changes have been made regarding the registration of grades, classes and exams. In previous years, before the implementation of the Bologna plan, students were given a little notebook at the beginning of their first year in which all grades had to be registered. The vote they received from the supervising professor was made official by the signature that the professor put next to their grade in their exam notebook, alongside the professor's name, the date of examination and the vote given. Additionally, the professors were required to hold a similar administration for themselves, making sure student and professor had a way of verifying the vote at a later time.

Nowadays, the students are no longer given the examination note book as all votes are required to be registered online. At the end of the exam, the professor is supposed to announce the vote to the student and, consequently, is required to register the grade in the online grading system. This system is accessible to both student and professor, giving both parties a chance to make sure the grade is valid, just and official. Students, furthermore, are obliged to apply for their thesis and exams online, previous to the starting date of their research project and date of examination. If not registered, the students' vote will not be made official. Though students who failed to register on time, almost always have a way validating their vote, the process of doing so is long and may result in study delay.

The final exam, or prova finale, is what would be called the final thesis in English. At the faculty of scienze filosofiche, the thesis is worth 18 credits, compared to 52, 5 credits at the faculty of History and Philosophy of Science in Utrecht. Students are expected to choose a topic related to their program and are responsible for finding a supervisor. This supervisor is, in most cases, one of their professors or a professor they have worked with in the past. As the amount of students supersedes the amount of professors working at the faculty almost seven to one (253 students enrolled in

2013-2014 to 37 professors) it is known amongst students that the search for a good supervisor needs to start early on in the second year. As soon as the students have found a supervisor they are to hand in a proposal, listing the topic, their question(s) and possible additional literature. If their proposal is approved, the student and supervisor will meet on a regular basis to discuss the student's progress and problems the student might be having in his or her work.

In theory, the thesis ought to be a well-written essay on an article, book or work, relating to the course curriculum and chosen by the student. It is supposed to be an original discussion of text's main arguments, the discussion of an originally developed argument and a statement with possible, additional, supporting literature. In collaboration with the supervisor, students are expected to produce a work of a minimum of 120 pages of 1000 words each. In addition to the written essay, students are expected to discuss their thesis at a small 'graduate conference', during which the student will be judged by his or her supervisor and another professor or teacher working at the faculty, who will attend the conference as a second supervisor. If the thesis requests it, the second supervisor can be a professor working at a different faculty. After the student has discussed the thesis, the attending professors will ask one or two questions relating to the specific content of the student's work and, in addition, one or two questions regarding topics related to the topic but not necessarily mentioned in the thesis, specifically. By answering these last two questions the student is supposed to demonstrate his or her ability to respond to critical questions without preparing for them, specifically. After the discussion and the answering of questions, the student will be rewarded an overall grade (maximum 110), after which, if the grade is a pass, the student is, officially, graduated. In reality, however, students who have come as far as holding the public discussion are asked to do so formally. Hardly ever are students failed on the basis of their colloquium, only.

When asked whether or not students had the opportunity to practice their research skills before writing their thesis, professors replied that skills training are not part of the official program. When asked, consequently, how students were to prepare for their thesis, one professor answered that if they organized their time well and used the time set out for their thesis, their master's thesis could function as a research proposal. The professor explained that students do not receive any training in academic writing or research skills but do receive extensive training in the study and

analysis of original treatises and texts. The thesis, therefore, is meant to be the student's first encounter with the practice of individual research and writing.

Libraries

The university has a large network of specialized libraries throughout Bologna, Cesena, Forlì, Ravenna and Rimini. Each library offers specialized literature for students of a specific department or related departments or holds a broad collection of literature that can be of use to students of all faculties. 27 libraries take part in the university library system with a total of 56 service points and over 5000 places to work, study and do research.[33] Some libraries can be found inside the faculty building itself and, most of the time, take up one or two floors. La Bibliotheca Universitaria di Bologna is commonly known as the 'mother library' of Bologna University and, in addition to its extensive collection of books, holds 1384112 manuscripts, incunabula, photographs and other works not traditionally considered *books*. In it one can find, furthermore, the hall of Aldrovandi, in which the works and manuscripts of famous natural philosopher Ulisses Aldrovandi are preserved, as part of the collection kept at the Museo di Palazzo Poggi. The library, moreover, houses the Museo Marisili; a museum dedicated to the founder of the Istituto delle Science Luigi Ferdinando Marsili. Throughout the years, parts of the collection have been transferred to the aforementioned Museo di Palazzo Poggi.

In addition to the libraries that are part of the official university network, many other public libraries offer workplaces and resources for students and researchers. The library, most famous, perhaps, for its location and its extensive collection, is the Salaborsa, which is frequented by students and non-students alike and offers 475 seats to study and read. In 2013 alone 1.223.819 visited the library. In addition, the Archivo Storico, or Historical Archive was opened in 2000 as a result of the university's wish to catalogue all documentation on the university itself and its students. The Archive consists of an historical department, a department of photography and of documentation on student life – it, also, houses a separate library. In 2013 it was integrated with the university's department of history, culture and civilization.

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[33](unibo, 2014a)

As such, students of scienze filosofiche and all other students, for that matter, have a lot of libraries to pick from. As scienze filosofiche is an interdisciplinary study, this selection seems even bigger. The *Biblioteca di Discipline Umanistiche, Biblioteca del Dipartimento di Filosofia e Comunicazione*, the *Biblioteca del Dipartimento di Storia Culture Civiltà -Scienze del Moderno. Storia, Istituzioni, Pensiero politico* and several libraries specializing in natural sciences, however, offer literature that is especially helpful to said students. It seems that, due to the various locations of the different libraries, many students choose to study outside of the library or in one of the public libraries that can be found in the city center. It seems that libraries such as the, aforementioned, Salaborsa and Biblioteca Universitaria are frequented by many students, resulting in waiting lines long before official opening hours

Rules in the university libraries are strict. No eating or drinking is allowed. Students are not allowed to talk, unless they have booked a student or group room. Occasionally, the libraries are used for seminars, conferences and protests. The inner city libraries, especially, are often used to hold political debates or chosen as the meeting point of demonstrators. Some libraries have designated areas for the consumption of food and drinks. Some even have small cafeterias or coffee shops which students can use for small breaks. In some libraries, students are allowed to smoke cigarettes in designated smoking areas located at the ground floor or in the garden. In the libraries located within the faculty walls, however, no cafeterias or smoking areas exist. It seems that students who frequent these specialized libraries usually work alone. Though most students seem to accompany each other to the library and finds seats close to each other, all studying is done alone. In the breaks, notes are exchanged and copies are made, zealously.

In addition to the literature offered by libraries and specialized bookstores, students are able to make use of a large amount of electronic resources. In total, 600 data banks holding 44.955 periodicals and 155.000 e-books are made accessible to students enrolled at the University of Bologna. All theses and research papers made or contributed to by students are published online as are several encyclopedias and dictionaries. Every department, furthermore, has its own database in which all material, especially useful, has been collected. Professors, moreover, can choose to upload teaching materials onto the university network, to make access easier for students or because the teaching materials consist of work not yet published or no

longer reprinted. Databases seem especially useful because of their large collection of ancient books that are difficult to find in translation or, often, because professors have published commentaries on the works themselves. At the history and philosophy faculties, especially, databases that offer online editions of full texts or ancient philosophical treatises come in handy, as most works are often very expensive and hard to find.

Although, in theory, a significant amount of English books are available online or in the libraries, works are often incomplete or outdated. In most cases, relevant English literature at the faculty library of the philosophy department, for example, has to be especially requested. Though almost all books are offered in Italian translation, a lot of works that have been published or translated in English are scarce or held in libraries in Milan, Urbino or Rome. If demand is great, books can be transferred from one library to another, though in most cases, libraries are only prepared to send books if university staff requested it. The library does, however, hold an impressive collection of philosophical works published in their original language; French, German, Italian, Latin, Greek, English and Dutch. An entire section of the library is dedicated to subject specific, scientific journals from all around the world. The philosophy and history libraries, furthermore, are famous for their collection of first editions, their archives and their collection of special and rare manuscripts.

To give a better overview of all libraries and the collections they hold, the university website directs students to the AlmaDL, the digital library of the University of Bologna, which lists all online resources accessible to university students; all libraries that belong to the university network and all individual catalogues. In addition, students can resort to the Catalogo del Polo Bolognese del Servizio Bibliotecario Nazionale, which is the online search engine combining all libraries in Bologna, and the OPAC SBN Catalogo Servizio Bibliotecario Nazionale, which is the online search engine of all libraries in Italy. Both search engines are especially helpful when students have a hard time finding books at their own library, or, even, if they have trouble finding a book in Bologna. The OPAC SBN enables students to find cities and libraries nearby in which they can find the book they are looking for. It, moreover, enables students to alarm a particular library in Bologna to consider purchasing a book or an edition or translation of a certain book, for which a high demand seems to exist. In recent years, the university libraries have created

applications and online services that enable students to renew their leases, check if certain books are still available and, if they are not, when they will be. Books can be borrowed for a period of thirty days that can be extended for another fifteen days maximum. The penalty for not returning books on time, different from Dutch regulations, is being banned from the library for the same amount of time it took to bring the books back. The maximum amount of time a student or visitor can be banned from the library is three months. If a book is not returned or damaged to such an extent that it is no longer usable, the person who lent it is responsible for acquiring another copy.

Museums

In addition to the many libraries in Bologna, the university offers a broad selection of museums that are especially valuable for students and graduates. Fourteen museums are part of the official university museum system in Bologna, 'SMA', or Sistema Museale di Ateneo:

- the Observatory Museum
- the Palazzo Poggi Museum
- the Zoology Museum
- the Giovanni Capellini Geological Museum
- the Herbarium and the Botanical Gardens
- the "L. Cattaneo" Anatomical Waxwork Museum
- the "L. Bombicci" Mineralogy Museum
- the Comparative Anatomy Museum
- the Museum of Physics
- the "G. Ciamician" Chemistry Collection
- the Museum of Veterinary Pathology and Teratology
- MeuS – the European Student Museum
- the Anthropology Museum
- the Domestic Animal Anatomy Museum.

The theme that bounds the universities together is the consciousness of man; the various museums offer visitors insight into the various ways in which established disciplines have developed throughout history and, most importantly, the various

ways in which disciplines have been approached and institutionalized. The Anatomical theatre of the Archiginnasio, for example, carved completely out of wood - to prevent the smell from attaching to the walls, as I was told by a very kind lady sitting at the entrance - attracts many visitors over the years. For a small compensation people are allowed to enter the small room that was, originally, built in 1637 but partially rebuild after its destruction in the Second World War. Together with the numerous exhibitions, collections and archives that are organized by the fourteen universities, the university museum system focuses on displaying the various important developments in the history and philosophy of science throughout the years. As such, the system is said to promote the idea that the combination of historical and 'scientific' perspectives allows students and other visitors to appreciate the history of science, as it is displayed in the fourteen different institutions.

In addition, the museums offer local schools and higher education institutions a chance to organize excursions, trips and workshops 'on location'. At times, rare collections are opened to selected groups of students, researchers and tourists granting those interested access to archives that are, normally, kept from the public. Throughout the year, many exhibitions are promoted or new acquisitions are put on display. Apart from their educational value, the museums provide students, graduates, researchers, curators, conservators, restaurateurs and cataloguists with valuable internships and job opportunities. The university museum system, moreover, emphasizes the importance of international conferences and seminars that enable students and professors from all over the world to gather at one of the museums to discuss and share ideas and possible projects. Though the university is, by far, the most important promoter of the Museum and its collections, all museums are autonomous and in charge of their own organization. As such, visitors can expect very different experiences stepping into each university museum.

Even though all museums are valuable for scienze filosofiche students, the Pallazzo Poggi Museum is often integrated in the history of science curriculum. Due to its location nearby the faculty building, professors may choose to perform part of their lectures on location and take their students to the museum. Its 'Ulisses Aldrovandi wing', especially, provides valuable material for students of history of the natural sciences or those studying the famous, 13 volume, *Storia Naturale* of Ulisses Aldrovandi, considered by many professors in Bologna as the founder of modern

natural history. The museum holds a large part of Aldrovandi's famous chamber of curiosities that, according to the natural philosopher himself, held around 25000 dried samples of 'diversità' di cose naturali'[34], variations of natural things, and plants, bound in fifteen volumes. In addition, Aldrovandi's chamber put on display 17 volumes of mineral, plant and animal drawings, as well as various drawings and descriptions of 'monstrosities' and 14 cabinets, containing the wooden blocks used for the printed drawings. The cabinet was moved from Aldrovandi's home to the Palazzo Pubblico in 1617, to the Palazzo Poggi, in 1742 and broken up in 1907 but the museum has tried to restore the chamber. It is now displayed at the Palazzo in the state that it is believed it was in when Aldrovandi opened it to the public in his own home in Bologna.

Whether or not professors decide to take their students to see a museum, exhibition or other cultural or scientific activity, seems to depend on their individual teaching styles. As the Italian constitution subscribes 'libertà d'insegnamento' or freedom of education, professors are not bound to prescribed curricula. Though guidelines exist and professors are judged on their performance, individual institutions have the right to create their own curricula and teaching styles. Due to professors' rights to develop their own course content, provided they respect the general guidelines the institution dictates, courses may vary extremely over the years or in comparison to similar courses at other universities or even with respect to similar courses at the same institution. Because of the amount of students attending the university, some courses are overbooked to such an extent, that additional courses are created, taught by different professors. As such, it might, very well, happen that students taking the same class have an experience that is quite different from others. Since dictated curricula, like the curricula in the time of fascism[35], no longer exist, professors enjoy a greater freedom in creating their teaching methods and materials, allowing them to incorporate works they are particularly passionate about or specialized in.

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[34] *a diversity of natural things*
[35] (R.C. Simonini, 1954/1955)

Research

In addition to the schools and departments, the University of Bologna comprises of nine 'centre di ricerca e formazione' or *research centres*, specializing in agriculture, medicine, engineering, policy, tourism, cancer, history, informatics, biomedical sciences and biomedical engineering, environmental studies and local history. Seven different research facilities of industry and environment specialize in aeronautics, life sciences, energy and environment, information and communication technology, mechanics and health sciences. In a recent campaign named *campagna 5x1000* the university asked students and graduates to support the funding of new young researchers at the university by singing the petition and inserting the fiscal code specified in the pamphlet. For the year 2014/2015 the university has accepted 43 doctorate students; the campaign has been running since 2006 and with the money collected form contributors the university is said to have collected a total of 391.607 euro between 2006 and 2012

Scienze filosofiche students, throughout their two year program, are trained to gain as much knowledge as possible on various historical and philosophical treatises and topics. In the seminars they are required to attend, this knowledge is explored further and discussed through individual presentations, the words of a specialist or group discussions. In their prova finale, the graduates are expected to use the knowledge they have obtained and the approaches to texts they have worked with throughout the years, in a final 'research' work: la tesi. In this thesis, as discussed before, students are expected to choose a specific work and analyze it or develop an argument on the basis of discussed literature or other relevant texts. In collaboration with a supervisor they are expected to develop an original line of reasoning, supported by technical arguments which they will later discuss in front of a small committee.

Students are given a style sheet and specific guidelines with respect to lay-out and text style and are, in addition, provided with guidance by a supervisor who has dedicated the biggest part of his or her career to research and writing. To be able to start working, officially, on their thesis, students are required to register for their prova finale, months in advance, online. It is their responsibility to find a supervisor and, under his or her guidance, relevant literature and other supporting texts and treatises. Depending on the student's agreement with his or her supervisor, student

and professor will meet every month or every two months – if not agreed upon otherwise - to discuss progress and possible questions. As the program is frequented by a relatively large amount of students and since students who are registered 'fuori' also need a supervisor; at times, individual professors are responsible for up to twenty or thirty students in total.

The amount of literature required for students to read is relatively large and a lot of the literature seems quite difficult to get through; students are expected to read, primarily, original works. Since many original works are either in Italian or available in both translation and original language students are given the opportunity to study the text from various angles and in different languages. One specific professor at the faculty, herself very experienced internationally, indicated to have studied works in French, Dutch, English, German, Italian and Latin and carries out her experience in class; key concept in works of, for example, Descartes and Spinoza are difficult to translate but, due to her knowledge of languages, students are familiarized with these concepts in the context of the work's original language. Another professor, having attended the University of Uppsala, similarly, involves his students in the works of Lavoisier not only through the thorough analysis of his works in Italian but through the discussion of some key passages in French and English.

As such, students seem to be taught early on that language plays a crucial role in understanding philosophical and historical works and, most importantly, that it takes more than mere reading to understand and fathom their meaning. Students need to learn how to contextualize and how to put passages into perspective. Even though, the study of entire original texts takes up a lot of time and requires a great amount of effort – although this depends on every individual student, naturally – students are taught to process large amounts of literature in a relatively short time. They are, furthermore, trained in quickly recognizing main arguments, distinguishing between important and less important arguments, understanding difficult and thick philosophical language and learning how to concentrate and contextualize. In their prova finale, they are given the opportunity to combine individual research, their reading skills and all the literature discussed in class in an individually produced, original 'Master'-piece.

Monday morning, Utrecht

8.00. I wait at the Bilthoven station for the train to Utrecht Central. The platform is filled with people: students that I can only assume are headed for class; others on their way to work; children accompanied by their parents on their way to school. The train leaves every fifteen minutes. I've missed the previous one. The 8 o'clock train pulls into the train station.

8.15. With a few minutes delay I arrive at an equally crowded, if not more, central train station. Travellers coming from stations all over Holland seem to be pouring in. I make my way to the bus station. My second bus leaves in ten minutes. It will take me to the university in another ten.

8.25. I arrive at the street in front of my university. With me dozens of, what I think are fellow students, get off the bus. I am early. I'll just go grab a coffee at the Lodewijck restaurant. I might even get some studying done.

8.55. I have already encountered three classmates. Together we are seated at a table in the library restaurant, drinking questionable coffee from one of the vending machines. We quickly drink the sip that is left in our cups and pack our bags. Class starts in five minutes. On our way to the classroom, we run into our professor. He recognizes us: "Good morning everybody. I'll be right in!" He walks in the direction of the vending machines. We keep walking to class.

9.02. We arrive in front of the class doors. Almost all students are gathered in the hallway. Just as we start greeting our class mates, the professor appears behind us. He greets everybody and opens the door. The chairs seem to be in disorder; another class must have been in it, yesterday. We put the chairs and desks back in the familiar circle and take a seat. The professor is unpacking his bag at one of the desks.

9.07. After taking attendance, the professors starts. First up: a quick inventory of the difficulties we have encountered in the literature. Students who are not speaking are taking notes or staring at their papers. Class is in session.
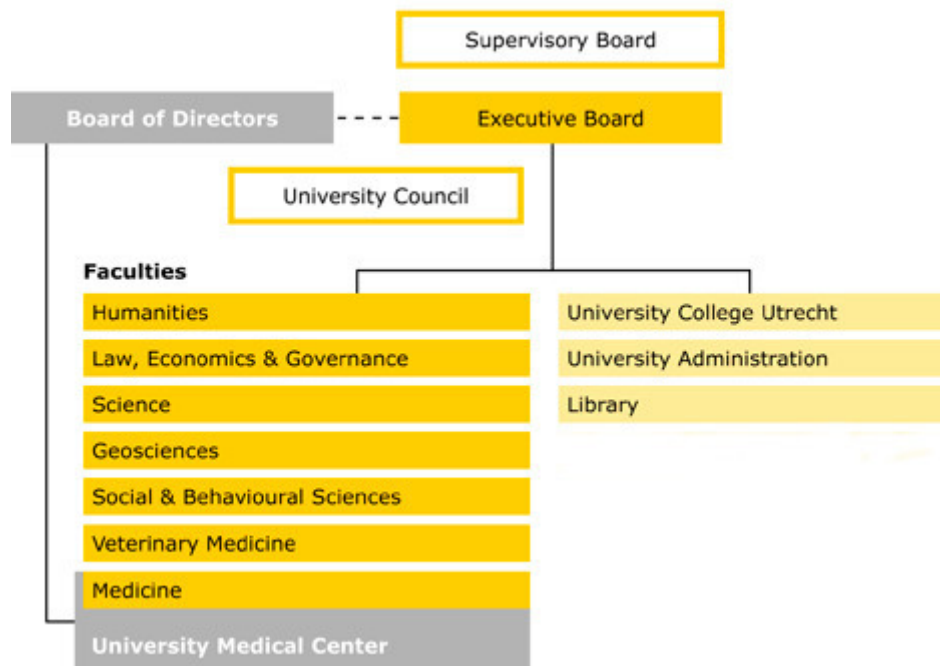
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Similarly to my discussion of the University of Bologna, I will now shortly elaborate on the University of Utrecht as a whole, before moving on to a short discussion of its HPS faculty. I would like to discuss the university's general structure and organization as well as its educational offerings, its programs and its student population. In my discussion of the HPS program, specifically, I will give a brief account of its history, its organization and a short oversight of what is, formally, expected from its students.

When you walk into the centre of Utrecht, the little 'kanaaltjes'[36] are hard to miss; the centre looks intimate, vacation-like almost. The sides of the canals are lined with little restaurants, bars and cafes. Some people lucky enough to afford a place at the water are seated at their terrace in front of the house overlooking the water and, when facing up, the large shopping streets filled with people from within and outside of the Netherlands. People who are unfamiliar with the city, might get lost. Similarly, charmed by the instant appeal of the canals, they seem oblivious to the fact that a bit further down, on both sides, dozens of little streets, just as beautiful, if not more, lead the way to even more restaurants, bars and clubs. One of them leads to the beautiful Inner City Library with attached to it one of the university buildings belonging to the University of Utrecht.

Officially instituted in 1636, the University of Utrecht is one of the oldest universities in the Netherlands. It consists of seven faculties and three institutes: the University College Roosevelt, University College Utrecht en the Centre for Education and Learning, het *Centrum Voor Onderwijs en Leren*. Faculties include the faculties of the Humanities; Geosciences; Law, Economics and Governance; Medicine; Science; Veterinary Medicine and Social and Behavioral Sciences. In 2014, the university counted 30.152 students, of which 5786 first year students and 1537 students from abroad. 1224 students at the University of Utrecht took part in an exchange program. In that same year, the university offered 45 undergraduate programs, of which 4 with English as the language of instruction, 138 graduate programs, of which 74 in English and 32 teaching programs, of which none offered in English. In 2014, the university, moreover, counted 637 professors, of which a large percentage belonged to the faculty of Medicine. Consequently, the student to professor ratio of the entire university was 1:47. The university is managed by 6349 staff members.

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[36] Little canals

Because of its many faculties, the university's property is not limited to one location. The departments are scattered around the city and located in both historical buildings and newly designed properties. The city centre is home to the faculties of the Humanities and of Law, Economics and Governance, while the other faculties, the faculties of Medicine, Veterinary Medicine, Geosciences and Social and Behavioral Sciences can be found outside the centre, for the most part at 'de Uithof'. The Uithof is a part of the city where the Utrecht Science Park, the Hogeschool Utrecht, the international campus of Utrecht University and the University Medical Centre Utrecht can be found. In addition to the faculty buildings, labs and libraries, de Uithof houses the flats reserved for international student housing: students who have trouble finding a place to stay in Utrecht can apply for one of the rooms in the large flat buildings on campus.

Due to the scattering of buildings, interdisciplinary faculties sometimes have buildings in both university areas. It can happen that the service centre is located at de Uithof, whilst classes are followed in one of the buildings in the city centre. This can lead to confusing situations. For the History and Philosophy of Science students, especially, classes are attended in both the city centre and the Uithof. However, since many buses are available to carry students from one campus to another and the majority of students have a bike; the distance seems to be, hardly, a problem. Locating

the main offices, however, might prove difficult. Since it is not always clear what administration should be addressed, the faculty of the Humanities or of Natural Sciences, for program related questions or document request, students seem to encounter some problems locating the right faculty front office or e-mail address.

The History and Philosophy of Science master at the University of Utrecht is a two-year long research master and the only research master, in Europe, in the field of History and Philosophy of Science, in English. It was founded in 1988 as a result of budget cuts at the university and a combination of The Institute for the History of the Exact Sciences, The Biohistorical Institute, the Department for Research in the Foundations of Physics and the Department for History of the Mathematics.[37] At the core of the research master lays a profound understanding of the practice of history and philosophy and, specifically, history and philosophy of science. As it is stated in the introduction on the faculty's website, the HPS program "(…) offers a unique opportunity to study the foundations, practices, and culture of the sciences and humanities from a historical and philosophical perspective."[38] It is, therefore, suitable for students with different academic backgrounds who are prepared to work together with others in discussing not only issues of the past but of the present and future, through the help of historical and philosophical approaches.

In 2013-2014, 33 students were enrolled in the research master, of which roughly one third foreign. The average amount of students enrolled per year has increased, significantly, over the years. At the start of the HPS program, only 13 students were enrolled, compared to the 27 and 33 students enrolled in the last two years. This is a small number compared to the number of students enrolled in scienze filosofiche in Bologna, namely 253 in 2013/2014. In recent years, the program has increased in popularity and has received an increasing number of applications. Students who are accepted to the program are required to attend and successfully complete three mandatory courses: History of the Humanities, Philosophy of Science and History of the Natural Sciences. Additionally, they are required to attend 6 seminars and 20 colloquiums hosted either in Utrecht or somewhere else, provided that the relevance to the program can be indicated. The three compulsory courses and seminars are worth 30 ECTS of the in total 120 ECTS required for graduation. To

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[37] (Evink, 2014)
[38] (UU, 2014)

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obtain the remaining 90 credits, students are required to choose primary electives, at least four, each worth 7.5 ECTS, and a selection of secondary electives, each worth 7.5 ECTS. The remaining 52.5 ECTS can be obtained through a thesis worth 52, 5 ECTS or through the combination of a smaller thesis and an internship or exchange period abroad, respectively worth 37.5 ECTS and 15 ECTS. The second year, in theory, is completely reserved for the thesis and, if preferred, an internship. In this second year, students are expected to use the skills and knowledge, accumulated in the first year, to produce their Master Thesis. To be able to do so, they receive help from a supervisor, in most cases one of the professors at the faculty. Upon successful completion of the program, graduates will be rewarded the title of Master of Science.

Study programme History and Philosophy of Science			
	Period 1	Period 2	Period 3	Period 4
Year 1	History of the Natural Sciences (required) Philosophy of Science (required)	History of the Humanities (required) Optional course	Optional course Optional course	Optional course Optional course
Year 2	Research seminar (7.5 ECTS) Research project, either consisting of: - a (research) internship, preferably abroad (15 ECTS), combined with a thesis of 37,5 ECTS, or - a thesis of 52,5 ECTS			

Workday (PBL)

A typical workday at the HPS faculty not only differs from the workday at the scienze filosofiche faculty in Bologna but even stands apart from most workdays at other faculties at the University of Utrecht. As the teaching system is, with the exception of courses belonging to other degree programs, Problem Based Learning, classes are kept

as small as possible and students are seated, for the most part, in a circle, oval or other type of group setting – it is not a classical model of lectures and examinations. As described in H.G. Schmidt's article *Problem-based learning: rationale and description,* Problem Based learning is "(…) an instructional method that is said to provide students with knowledge suitable for problem solving."[39] Though it has its roots in the medical faculty, where it is used to accurately study medical case studies, PBL has gained popularity, in recent years, and has been used as a teaching method in an increasing amount of different faculties.[40] Those supporting the method argue that the PBL method teaches students how to apply the knowledge they have previously gained to practical situations and, furthermore, how to make a distinction between useful and irrelevant knowledge in the heat of a discussions. It is, moreover, believed to enable students to integrate the knowledge they may have obtained from studying different disciplines and use it to critically analyze a situation or case study, though different approaches and angles. An example that illustrates the believed usefulness of the PBL system is mentioned in Schmidt's article[41] as he describes a group of physics students that was acquainted with the concepts of modern mechanics "(…)but was unable to use them in understanding real-world phenomena."[42] In other disciplines, such as law, social geography, sociology and planning science the same phenomenon was observed: "When writing a report on some topic or solving problems, these students seem to be unable to use the knowledge they had acquired."[43]

As PBL is based on the idea that students should be encouraged to, actively, participate in group discussions and the analysis of case studies, professors and teachers have a, primarily, guiding role in class. They are responsible for the supervision of the discussions and, if necessary, student encouragement. A big part of the supervisor's role in group discussions seems to be, therefore, making sure that every student is given the chance to share his or her ideas. In some cases, students are even asked to take over the role of discussion leader and are required to take on the responsibility for one -part of- a seminar or class meeting. They are asked to prepare a topic, read up on the literature and prepare the material, adequately. If prepared well, students should be able to guide their fellow students in such a way that all core-

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[39](Schmidt, 1983)
[40] Idem.
[41](Schmidt, 1983)
[42] Idem.
[43] Idem.

issues are discussed or, at least, touched upon. They should, furthermore, make sure that unclear concepts and terms are clarified at the beginning of the lecture and should be able to either answer questions themselves, or guide fellow students in such a way that they are able to find the answer. For some, this task proves challenging, for others it seems to come naturally. Regardless of individual abilities, however, being a supervisor trains students in studying articles and teaches them how knowledge can best be transferred to others - in some instances, students are asked to prepare an additional short presentation on the topic of discussion, as to ensure all the core issues are at least mentioned prior to the discussion. In these classes, students are trained in both presentation and leader skills.[44]

In the first semester of the program, especially, it seems that a lot of students who are unfamiliar with the PBL teaching system have a hard time adapting to the 'new' PBL situation. This goes for both students and professors, as the functionality of the system depends on the way students and professors are able to collaborate. Students who are used to a classic lecture system seem to be hesitant to speak up or, because they tend to put up their hands and wait their turn, are not heard. Similarly, some professors try to keep the oversight in such a way that they tend to overcorrect and, consequently, create an atmosphere that is similar to the atmosphere at a lecture: the professor talks and students listen. Other professors, afraid of overcorrecting, offer little structure and, consequently, do not succeed in guiding students into fruitful discussions. In these cases, the discussion stops or students, due to lack of direction, keep circling around the same or similar problems.

Because the success of the PBL system seems to depend, therefore, on a relatively large amount of factors, students, possibly, experience classes very differently. Whilst some deem discussions a success, others claim that they are too distracted by fellow-students talking to be able to grasp the message of the class. Students who are enthusiastic might be considered 'too loud', while other, shy students might be considered disinterested. During the additional seminars, primarily supervised by PhD students or assistant professors, these individual differences between students seem to be emphasized, even more. Since the age-difference between HPS students and PhD students is significantly smaller than the age-difference between students and professors, the relationship between students and supervisor

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[44](Schmidt, 1983)

seems crucial to the success of the seminar: as the PhD students and HPS students are practically equals with respect to age and career, an impersonal atmosphere seems to be created, often – one that is not, necessarily, beneficial to the discussion. The fact that seminars are attended by both first and second year students adds to this fact, since the second year students, in most cases, are already familiar with the PBL system and the assistants or PhD students in charge of the seminars. In these cases, some of them might have even established friendships outside of university. Though these personal relationships may prove beneficial in some cases, as students are made to feel at easy during the seminar, the quality of some seminars seems to suffer from it. Those who do not have a particular relationship with the supervisor might feel intimidated or discouraged in speaking their mind.

Professors

After students have been accepted to the History and Philosophy Research Master, most of them are invited to a short welcome interview. This is the first moment of contact between future student and professors. In most cases, the program coordinators take these individual meetings and ask students to elaborate on their master choice. Students are asked what they expect from the program; they are asked to motivate their decision to apply and are, furthermore, asked why they think it is important to study history and philosophy of science. This initial meeting sets the tone for further communication between professors and students. Seeing how the number of students enrolled in the program is, relatively, small, students have a chance to leave a good impression and/or ask question they were, perhaps, scared to ask via e-mail.

At the HPS program the contact seems very personal and direct. Students are involved in their education, through student representation and meetings with the coordinators, and, due to the fact that many professors in charge teach master courses themselves, are in regular contact with their professors. It seems that, at a fairly early stage, students have a chance to create a rapport with their professors, either through active participation in classes or through direct contact with them in revision sessions or progress meetings. Additionally, since the master is focused on research, primarily, students are expected to practice research and writing skills from the very beginning

of their master and do so, by means of assignments that can be discussed in person with the professor(s) of the class. A lot of attention is paid to discussing students' progress and their ability to handle the fast pace of the research master. In the beginning, especially, students who are not familiar with the research environment might be unsure about their place in the program.

In addition to the, somewhat, official meetings between students and professors, students can request meetings to discuss any other relevant questions or issues. Many of the professors have an open door policy or, if not, are willing to schedule meetings throughout the week. Students who are unsure about their work, work ethic, attitude or any factor related to their place in the research program are able to consult one of the professors. Similarly, professors might reach out to students for additional assignments or support in seminars or, if students seem especially preoccupied or uneasy, professors might ask for a personal meeting to make sure anything can or should be done. Some relationships between students and professors, as such, grow seemingly strong. As the program is a two year research program, a lot of time is spent consulting one another. It is not uncommon, therefore, that some of the students and professors are on a first name basis – although, to some extent, this depends on every individual, personally. In addition to being invited for requested meetings, either by professors or students, students are invited for evaluation meetings in specific periods throughout the year. These meetings, in most cases, take place right after the end of a semester and are, often, held at the program's coordinator's office. In these meetings students are asked whether or not they feel they are doing a good job, whether or not they have managed to pass all compulsory courses and, if necessary, whether or not they feel like they are making progress in their research.

Becoming a professor, or 'hoogleraar', in the Netherlands requires quite some work and effort. To be eligible for a position as a professor one needs to be in possession of a Master's degree and a doctoral title that, on average, takes about four years. After being promoted, it is possible to become a university teacher meaning that the candidate is allowed to give classes but does not have a permanent position at the institute. Only upon becoming a university teacher, is it possible to be recommended for 'hoogleraarschap'[45]. To become a university teacher, however, the candidate has to be recommended and selected by various committees and relevant admissions boards.

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[45] *professorship*

Since competition is fierce and research is costly, independent research have the opportunity to apply for scholarships, such as the 'NWO' scholarships, international scholarships and/or competition in which winners are rewarded with research funding. Competition for these types of funding, consequently, is just as fierce.

The road to becoming a professor, therefore, is long and hard. To illustrate just how hard it is to become a professor, Professor dr. ir. Wiebe Bijker, of Maastricht University responded to an interviewer's request for tips about becoming a professor, in Dutch newspaper de Observant, by stating: "Do not try to be one." In the article, he explains how young researchers, instead of desiring a position as a university professor, should desire becoming the best researcher and teacher they can be. If they work hard and deliver valuable and quality work, they will be noticed and they will be rewarded for their efforts - they might even be rewarded with a 'hoogleraarschap'. Because becoming a professor depends on so much more than personal will and conviction, it seems rather pointless to 'want to become a university professor'. As Bijker explains: "When I hear people say 'I want to become a professor', I cannot help but think: You did not really understand what it is all about."[46]

As Dutch students are to finish their bachelor and master degree with a maximum of one year study delay, to avoid significantly higher tuition fees, many students tend to go to university or college fresh out of high school; as such, PhD students seem, relatively, young as master's graduates quickly move on to the promotion track. In addition, Dutch students, different from students in Bologna, are able to graduate from high school at the age of seventeen, eighteen – making them a year younger than fellow high school graduates in Italy. Students who are, in fact, prepared to pay higher tuition fees and do not graduate within the given amount of time are not allowed to study as long as it takes for them to finish their degree; depending on their program, these students, too, have to graduate within a given amount of years or they are not allowed back to the program for a specified amount of time. As such, it seems, the average professor at the HPS faculty of Utrecht is, by comparison, young. With new PhD students, fellows and postdoctoral students coming in every year, from all around the world, the staff seems to consist of members belonging to various age groups.

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[46] (Kools, 2011)

Technology

HPS students are responsible for the purchase of their own teaching materials. As most exams are taken in the form of a written paper on a topic chosen by students themselves, it is hard to pinpoint which books will be needed throughout the course. Moreover, since students are encouraged to read as much literature as possible, students might decide to read additional literature to clarify topics or additional articles and books for their own interest. In many cases, however, a list of core texts is compiled at the beginning of the course or seminar. Sometimes, the list is even compiled in collaboration with the students - in seminars, this is always the case; students are asked to send in preferences or are asked to vote for one or two books listed by the seminar supervisor.

In the three mandatory courses, most of the time, literature lists are compiled. In the Philosophy of Science course, students are requested to read and study list of specific texts, books and individual articles - the same goes for the History of Natural Sciences Course. In the course History of the Humanities, students are encouraged to read as much additional literature as possible. Even though, a list of core texts is compiled, these texts function, mainly, as guiding literature in discussions: to ensure a central topic in class, literature has to be agreed upon and read by all participants in preparation for class. When students fail to prepare adequately, namely, the quality of discussions suffers or only part of the class is able to actively participate; those unprepared are naturally excluded from the class debate or are asked to leave.

To help students in the purchase of required literature, students' discounts are maintained. By showing their student card, students can get a discount on books in a couple of selected bookstores. Despite the discount, however, many students seem to find books very expensive and, to solve this problem, some students decide to share the costs of one or two books and, consequently, distribute copies of the required passages and articles. Second hand books are put on sale online, either on the HPS Facebook page or via student e-mail. Every HPS student is given an individual g-mail e-mail address with an inbox accessible through their personal credentials. If books are out of print or no longer in stock at bookstores or online, professors might decide to distribute copies of their own book or reach out to students from previous years, asking them to contact the students in need of the book. In some courses, professors

distribute course hand-outs in one of the first classes, in which all case studies and literature are listed. Most professors, however, publish the course catalogue online or distribute it through student mail. In other situations, professors may decide to spend the first class consulting students on how they would like to structure the course. This does not imply that students have the ability to structure the module in its entirety but it does mean that they have a say in possible changes to the class schedule, the list of required books or length of classes.

The university Website of Utrecht University, completely reorganized in the academic school year of 2014-2015, is a very extensive and regularly updated website. As the university aims to be a leader on both a national and international level, the site's main language is English. Though, it is difficult to judge information given on universities' promotional sites, it is interesting to see what the respective universities choose to share and not share on the public forum. Utrecht University, for example, mentions, on many occasions, its list of price winning alumni including Nobel Prize winner Gerard 't Hooft and Christiaan Eijkman. It is, however, interesting that in the list of professors per faculty the faculty of History and Philosophy of Science is missing. In most classrooms, a chalkboard and/or Digi board are available. Depending on the course, professors may decide to use the boards to make notes during classes, jot down important keywords in the break or put up schematic summaries and mind maps. In some cases, students are assigned to take notes during lectures. In a lot of the philosophy classes, however, professors seem to prefer guiding the class through the use of one single book and prepared summaries that are not put up on the board. In these classes, the professor will choose to read or emphasize certain passages, most of them already read by students as homework and analyse them more profoundly during the discussions. In other cases, the professor may choose to include questions, regarding the texts, in students' homework, to ensure that students come to class prepared.

The amount of leaflets and printouts handed out during or after class seems to be kept to a minimum. As the semester draws to a close, professors might decide to hand out schematic explanations of the desired structure of the final paper to be written. This is done, however, primarily, in the first classes of the first year. Most of the notes and summaries are shared via e-mail or via the university's website. Students who have been assigned note taker are asked to share their notes with fellow

students and the course professor, through their student e-mail. In presentations, students are encouraged to use either PowerPoint or interactive mind maps. Possible summaries made that could be of value to the entire class are shared, either through mail or through the master's Facebook page. The same goes for valuable reference lists, previously written articles and summaries provided by students who have already taken the class.

In the Philosophy of Science course, especially, summaries are shared and made in collaboration. The course, amongst students, seems to be notorious for its final exam: in preparation of it, students spend weeks making summaries and sharing notes. In addition, students are required to hand in summaries with the assistant professor of every article discussed in class. These summaries make up part of the official, overall course grade; students are judged on the accurateness of their abstracts and their ability to find the main theme in dense philosophical articles. In order for them to pass the class students can fail not even one of their handed in summaries. These summaries, in times of examinations, are discussed, shared and analyzed by students preparing for the, seemingly notorious, final questionnaire. Some students decide to organize study groups; others decide to partner up, whilst some others prefer to work alone.

Exam dates, class schedules and changes made to planned conferences and lectures seem to be, exclusively, made public online, either via e-mail, or through the online system of Osiris. On Osiris, students can log in using their student credentials. All study results and course progress of every individual student are posted there, online. In addition, administration concerning possible internships, exchanges abroad, course content and class schedules are published. Through Osiris, students can easily check up on their grades and progress. To make sure all grade lists are compliant with official regulation, the examinations office verifies the list in the last months before graduation. If students need an interim list of grades, this list can be downloaded via Osiris and signed by the faculty's administration office.

Though, in theory, Osiris is said to be an efficiently working application it still seems to need some adjustments. In many cases, HPS students are not able to register online for their courses due to scheduled maintenance or because of the fact that they are trying to register for courses that are considered 'discipline specific' and their HPS enrollment is considered a 'failure to meet requirements' as it is interdisciplinary and,

therefore, not in compliance with Osiris requirements. In these cases, students are referred to the administration offices where the registration is carried out manually. In addition, it often seems to happen that grades or courses are not registered correctly, or class schedules have not been updated in accordance with changes made by the professors. Therefore, although Osiris is a well working system in theory, both students and professors seem to struggle with unnecessary registration issues that instead of speeding up bureaucratic processes, seems to slow them down.

Since many students attend classes at different departments and/or universities, schedule conflicts are not uncommon. In some cases, an agreement can be worked out; students that need additional traveling time to get from one class to another are allowed some leniency or are allowed to miss one or two classes – attendance is, after all, mandatory. In some classes, however, conflicts in schedule cannot be resolved and students are asked to take a different class and take the desired class the following year. Students are required to attend a minimum amount of classes. In most cases, they are allowed to miss two or three, depending on the total amount of classes held. If a student fails to do so, he or she will automatically fail the course. Sometimes, writing a substitutive paper is sufficient to make up for the lack of attendance but this rule applies, only, provided they have attended a minimum amount of classes. Professors might decide, furthermore, that students arriving late are no longer allowed to participate. Arriving late in these classes, basically, means 'not having showed up at all'. Professors hold a personal system of registration that, at the end of the class, is processed together with grades of the presentations, papers, reviews and the student participation.

Examinations and thesis

HPS exams are always written. In some cases, students might be asked to discuss their assignments in a meeting after they hand them in but the original examinations are, virtually always, conducted in writing. Exams might differ from each other in the sense that some of them require students to write a paper, while others require a well-written research proposal, a literature review or answers to either open or closed questionings. For most courses, however, students are expected to write a short paper or literature review.

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In the mandatory courses; History of the Humanities, Philosophy of Science and History of the Natural Sciences, these differences become clear: for the History of the Humanities course, students are expected to write a number of academic papers on discussed literature, while, for the Philosophy of Science exam, students are expected to answer a range of open and closed questions regarding the philosophy articles discussed in class. For the History of the Natural Sciences course students are asked to write a literature review and an additional, final paper. Since the Research Master has an international character, all instruction is in English - except, in some cases, in which professors are sure to have a class of only Dutch students and it is decided to converse in Dutch. Students of whom English is not mother tongue are, sometimes, advised to take part in academic writing workshops or additional skill trainings. The first papers written for the master are, therefore, crucial. On the basis of these papers professors assess not just the student's study abilities but the quality of the student's writing skills as well.

In most cases, students are in charge of finding their own research topic for the required individual papers. In some courses, a general topic might be decided on but, in general, students are expected to find an angle themselves. As such, from the beginning, students are trained in developing research strategies and setting up an argumentation. At the beginning of the program students' progress is monitored, closely. Students are asked to discuss their choices and are given a chance to use the critiques on previous papers in the writing of their future ones. If time allows it, students are even encouraged to practice their peer review and asked to grade and discuss the works of their fellow students. Additionally, besides the writing of papers, students are required to hold presentations throughout the year; topics range from discussed articles, books or individually written papers. Through (group) presentations, students are trained for possible future conferences and colloquiums and are, furthermore, forced to work on presentation skills, fluency in English and eloquence.

As students are allowed to choose from a varying amount of topics, in addition to the three mandatory courses, they have the opportunity to shape their education, in their own way. Students can choose, relatively early on in their first year, what they want to specialize in or whether or not they feel they need to orientate themselves more before deciding. The curriculum states that students are required to take three

mandatory courses that make up 25% of the required credits, to ensure that the students, coming from different bachelors, are brought up to the same level. Because of the interdisciplinary character of HPS, all students need to be familiar with the same basic historical and philosophical strategies and concepts. The first months of courses seem to be known, amongst students, as the 'make or break it' weeks. Students who fail to pass the compulsory courses are advised to change program or seek additional help in passing the reexaminations. In case they fail the re-sits, students are forced to retake the course in a following year.

As the course curriculum allows students to choose additional courses that sometimes belong to other degree programs, some students are able to experience both group discussions and classical lectures. The History of Biology course, for example, that was made accessible to HPS students in 2014, was taught in the form of a series of lectures. Students may even choose to take courses at other universities, as the universities of Leiden and Amsterdam, especially, make some of their courses accessible to HPS students, in agreement with the University of Utrecht – provided that students have the approval of the Board of Examiners. As such, students may choose to compile a curriculum that is very different from those of their fellow students. The proximity of the various different universities to the central position of the University of Utrecht makes the combination of courses even easier.

In addition to the possibility of following courses at other Dutch universities, students are allowed to do an internship, either in Holland or abroad, or to follow additional courses at a university in a different country – provided that the content of the internship or courses are compliant with the HPS program. The University of Utrecht, in the academic year of 2013/2014, offered student positions to 1537 students from abroad, this means that 26.56 % of the 5786 first year university Utrecht students were exchange students coming from abroad resulting in a overall 5.10 percentage of exchange students of the total amount of students (30125) attending the University in 2014. One should take into account that, apart from the exchange students attending the University for a semester or a year, the University is attended fulltime by a significant amount of foreign students.

Since the program consists of two academic years and students attending have different backgrounds, HPS seems to provide students with a self-sustaining support system within the group of master students. Those who are trained in one topic are

able to help those who are not. Because of its two year structure, furthermore, students who have already had experiences with the program and are still in their second year can provide information valuable for students in their first year. This system is encouraged through various student initiatives, such as the student social media website and the activities planned by student committees. It seems that, especially in the first months of the program, students who find the courses challenging group together and, actively, cooperate in mastering the course content. The group work is further encouraged through various group assignments and presentations, created by the professors with the purpose of teaching students how to produce quality work, while working with others. Though, naturally, group work is not preferred by everyone, it does force students to consider approaches and arguments that they might not have considered themselves, initially. It forces students, moreover, to take a look at their own way of working and, as such, can give rise to valuable self-reflection.

The fact that the professors, too, share different backgrounds makes for an environment of interdisciplinarity that is shared by both students and professors. Since, in the Netherlands, a lot of the teaching at university is done by PhD students or assistant professors, the relationship between the different members of the program seems to constitute a network of equality rather than inequality; authority seems to be carried out by professors only through the guidance and support of students. The age difference, furthermore, between students and teachers, is relatively small. Due to the fact that PhD students, often just graduated themselves, take up a big part of the lectures and seminars, students are treated as fellow participants in discussions and conferences, rather than subordinates. In addition, students quickly learn that the connections they make throughout their master, with both students and professors, might prove invaluable in their job search after graduation. Much like in Bologna, students who have established a good rapport with professors who are well-connected, might be recommended for or directly referred to an available position. Especially, in the case of professors starting a new research project students might benefit from their good behavior and quality work delivered, during their studies.

In theory, the second year of the research master is reserved, entirely, for students' individual research. Though, an internship might be combined with the Master thesis students are expected to use the second half of their master for the

preparation and writing of their thesis. If an internship or semester abroad is preferred, a strong link between the internship, or exchange, and the HPS program curriculum needs to be indicated. Internships, for example, need to be of value to the chosen thesis topic and courses that are taught at the exchange university need to comply with the courses taught in the research master. If the thesis is written in combination with an internship, students are required to write a thesis worth 37.5 ECTS. The internship is worth the additional 15 ECTS and, together, they make up almost half of the total amount of credits needed to graduate. Students who do not decide to do an internship are required to write a thesis of 52.5 credits since, in theory, they have a year to conduct their research and write their thesis.

All theses ought to be written in English. Guidelines and instructions are distributed, by the coordinator, through a leaflet that students receive prior to the start of their thesis. In addition, they are required to register for their research project in the online registration system 'Osiris', in which all classes taken, failed or passed, are compiled. Before registration, students ought to have found a supervisor, a second supervisor and an approved topic. In general, students are urged to start their search for a supervisor, early on in the second year, or even at the end of their first year. As many professors have additional functions and positions, their availability cannot be guaranteed.

If a professor decides to be a thesis supervisor, on the basis of his or her availability and the student's research proposal, the student might be asked to reformulate his or her proposal. If both parties agree on the research goal and strategies, the project is approved and a registration form is sent to the university administration. The form has to be signed by the master student, the thesis supervisor and at least one other official at the HPS department. A short, approved, summary of the research topic ought to be given and a tentative research title should be indicated. In addition, research goals are to be specified and a careful strategy has to be explained. As soon as the request is approved and the project is registered online, the student and supervisor will plan several meetings throughout the following months or weeks, depending on both of their preferences, to discuss the student's progress and the quality of his or her work. The graduation date that is worked towards will be made official, only, if supervisor, second supervisor and administration have confirmed the successful completion of the thesis.

Libraries

Four libraries in Utrecht are considered University Libraries: the Mathematics Library, the University Library City Center, the University Library Uithof and the Library for the University of Humanistic Studies, with collections belonging to the departments of Geosciences, Social Sciences, Medicine, Law, Humanistic, Humanities, Governance, Economics, Veterinary Medicine and Science. The library at the Uithof is, by far, the biggest university. It has six floors and offers students over 660 individual study places, half of which are equipped with computers. Additionally, 22 individual study rooms, 4 printing room with 7 printers in total, a Special Collections Reading Room and 4 double study rooms are available, for university students and staff. As the Uithof Library holds a broad collection of literature of all departments, the library is frequented by students of virtually all faculties. HPS students seem to benefit from the fact that multiple collections are gathered in one place. The HPS assignments, often, involve specialized literature from different departments. The online search engines, furthermore, make it easier for students to locate literature and articles they might need.

In addition to the Uithof Library, the University Library City Centre provides students with many literary and digital resources and is frequented by a lot of students because of its central location. Some of the faculty buildings are located behind the library, resulting in a steady stream of students passing through the library each day, on their way to class. As the library is frequented by many non-students or students from other universities or higher education institutions, students are required to carry identification after 5 p.m. As such, it is hoped that study places can be kept available for students only, preventing abuse of the library's facilities. Additional regulations are implemented to ensure the availability of study places: desks that have been left for over thirty minutes are cleared; students who fail to return in time or try to keep a spot open for a friend lose their study place. Though, this rule applies to all university libraries in Utrecht it is hard to carry out, in practice; the library is, simply, too big to keep oversight.

The Mathematics Library and the Library of Humanistic Studies are significantly smaller in size. The Mathematics Library is placed within one of the

faculty buildings and the Library of Humanistic Studies is positioned in the city centre, albeit less central than the University Library City Centre. As a result, these two libraries are frequented less by students in general but, rather, visited, regularly, by those who are in need of very specific literature.

The City Centre Library and the Uithof seem to be used, moreover, as central meeting points for group work or lunch. The City Centre Library, especially, is popular with students who need to lunch as it has a library restaurant, *Restaurant Lodewijk* that serves hot meals, has several vending machines and sells beverages, fruits and sweets. It, moreover, provides access to the cortile and two rooms reserved for the consumption of food. Students are able to pay with their bankcards as well as their student cards – provided they are sufficiently charged. The student card, primarily used for student identification, can be used as a chip card in the purchase of coffee, food and products out of the vending machines but, also, provides access to the printing and copy facilities. Throughout the university and library buildings students can find the chip card charging stations. These stations allow students and staff to charge their cards, with bankcards only. In some cases, payment is carried out, exclusively, through student card; the printers cannot be used by those who do not possess a card, nor can books be lend or returned without it. As such, it is ensured that a number of facilities are available to students and staff only.

In addition to the collections offered by the university libraries, the university offers an online collection that comprises many more books, articles and relevant literature. The catalogue is accessible only through student and staff credentials. It, furthermore, gives students the opportunity to search through public university archives, the collection of graduates' thesis, dictionaries, translations, encyclopedia and catalogues of partner universities. Additionally, it offers online editions of books belonging to the Special Collection, first editions of historical texts, many philosophical treatises and texts in foreign languages. All information can be accessed through various different categorizations; students may choose to search on the basis of topic, title, department, date, language, author and keywords. In some cases, links are placed in course curriculums, referring students, directly, to the source material available online.

Aside from the online catalogue and the collections and archives offered by the university libraries, Utrecht University holds a Master's/Bachelor's thesis Archive in

which all theses written by students attending the University of Utrecht are conserved. Beside the fact that theses provide a valuable source of information, they come in handy for students looking for examples or references and, additionally, are useful in investigating whether or not a desired topic has, already, been chosen or discussed - and, if so, to what extent. The Archive of Utrecht, moreover, holds over 27 kilometers worth of documents, archival work, publications, illustrations and photographs on the history of Utrecht, the city and Utrecht the province.[47]

Museums

The University Museum of Utrecht is affiliated with the university and is part of its Centre of Science and Culture in the university board and centre of services. Famous for its botanical garden *De Oude Hortus*, it opens its doors, every day, for visitors with an interest in science, culture, history and contemporary exhibitions. Located in the centre of the city, the university museum often employs students or graduates and offers internships and volunteering positions. In addition to the exhibition, visitors can participate in workshops, guided tours and interactive games. Children are invited to do small 'experiments'; test their knowledge through educative quizzes or participate in one of the laboratories or workplaces. The museum, even, hosts birthday parties for children and, often, opens its doors for conferences and lectures hosted by the university or one of its partners.[48]

Even though, the University Museum is the only museum, officially, affiliated with the University of Utrecht, many other museums offer valuable insights into various disciplines and departments. The Sonneborgh Museum and Observatory, for example, seeks to promote the popularization of meteorology, astronomy and affiliated disciplines as well as the practice of amateur astronomy. The Centraal Museum Utrecht, in addition, provides visitors with information on history, art, design, actuality and future.[49] Lastly, the city of Utrecht has opened its 'Domtoren' to the general public. The Domtoren is perhaps the most characteristic feature of the city; it is a tower of 112 meters tall and 465 steps high. It offers a view over Utrecht and of cities in its vicinity.

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[47](UU, 2014)
[48]Idem.
[49]Idem.

Because of Utrecht's central location in the Netherlands, students who live and/or study in Utrecht have the opportunity to travel to neighboring cities such as Amsterdam and Rotterdam, in which many other museums and libraries might be of use to them. In much the same way, many students living and/or studying in neighboring cities visit Utrecht and its museums and libraries. This seems, especially, practical for students of interdisciplinary studies or students who choose to attend classes at different universities in the Netherlands. Even though, the University Museum does not collaborate specifically with the History and Philosophy of Science Research master, many collections are relevant for its students. The museum exhibits, for example, a particle accelerator and a cabinet of curiosities. It, furthermore, houses various offices belonging to the university organization 'Studium Generale'.

Studium Generale is a university platform that offers anyone who is interested in science, culture, technology and their intersections a chance to host, attend and organize various lectures, conferences and seminars. Through its website, blog and newsletter it keeps its followers informed on upcoming events and frequently posts interesting articles, blogs or newspaper entries. It, furthermore, offers academics from all over the world a chance to voice their opinion on upcoming books or publications. It, moreover, organizes conferences in which universities from all over the world participate. Students interested in the discussion platform may choose to spend a part of their studies interning at the institute. Their internships might involve updating the Studium Generale website or its blog; working together in the organization or promoting upcoming events. Many of the talks and contributions by scholars are videotaped and published online – since those interested in the platform do not need to register, officially, or pay any kind of contribution fees, the information distributed through the platform is available to everybody, free of charge. On the website, popular articles in the media and recent publications are, regularly, combined. As such, it is hoped, that issues are put in new perspectives and readers are urged to share their comments and thoughts. Its information is categorized by means of the four scientific categories, formulated by the University; Dynamics of Youth, Life Sciences, Sustainability and Institutes.

The digital 'Academy' of the SG initiative is dedicated to all articles, blogs and relevant pieces on academics and the shaping of education. Interested parties may post their personal thoughts on the subject in the form of a blog or an article.

Suggestions can be done with reference to possible interesting lecture or conference topics or articles visitors feel people ought to be read and/or analyzed. It, additionally, offers students the opportunity to participate in resolving issues of sustainability, by proposing student initiatives such as recycling and promoting sustainable production of food.[50]

Research

Research is a fundamental part of not only the HPS research master, but of the University of Utrecht in general. As the first Dutch university, the University of Utrecht distinguishes between fifteen 'focus areas' in which research activities should be focused. These focus areas shape the way in which interdisciplinary research is carried out and in what way it is used to solve or clarify societal issues.[51] Different research teams are concerned with various problems, such as climate change, sustainability, pollution, health and safety. In 2011, the University decided to broaden its focus and include interdisciplinary research into specific issues identified in society, conducted by teams of academic excellence. Four themes were defined: Life Sciences, Dynamics of Youth, Sustainability and Institutions. The different teams consist of members belonging to various departments and scholars with different specialties. Through their collaboration, it is hoped, new approaches and solutions to pressing issues of sustainability will be brought to light, as will valuable methods for establishing strategies and setting new research goals. Although, this is the reality as it is represented on the university website, the four themes do not seem to be an integral part of the students' and professors' workday. Though research is, indeed, conducted in light of a certain theme that contributes to the university's and the faculty's policy and interdisciplinarity, the new research goals are not as clearly defined in every day practice as the site seems to suggest.

In the HPS program, these ambitions are translated into a clear focus on the development of research skills and academic writing. Culminating in the students' Master thesis, students are trained, from the first weeks of their first year, in setting research goals and developing effective research strategies. Through the writing of

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[50] (UU, 2014)
[51] Idem.

their own individual and group papers, students are introduced to academic writing and judged on their ability to, adequately, formulate an argument; structure a set of arguments and deliver a conclusion. In addition, students are required to read a substantial amount of specialized literature and articles to prepare for classes; it is through the reading and analyzing of this literature that students are made familiar with the way in which scholars write and have written successful proposals and articles. Included in the writing skills are specifics on quotations, references, issues of lay-out and annotation.

Since HPS students share many different academic backgrounds, the degree to which students are trained in writing research papers differs. In the first semester it becomes clear, often, that different academic backgrounds have had an influence on students' individual writing styles. It is, therefore, emphasized, in class, that students with a technical background have been trained in writing concise papers with tables and graphs. Students with a background in history have been trained in writing papers in which the focus is on use of language, the phrasing of arguments and the way in which words are used to illustrate events or historical facts. Though both approaches are adequate, HPS students are trained to distinguish between different writing styles suitable for different papers. For some research papers, it might be beneficial to combine styles, whilst for other papers, written in the light of a different discipline, a more specific style might be required. Since, students work, closely, together they have the opportunity to ask fellow students for writing help and/or advice. Since the compulsory courses range from quantum mechanics to history every student has a different role and value in the discussions and skill trainings.

Change

Though, I have delivered a quite extensive account of my observations and findings, with regards to the scienze filosofiche faculty in Bologna and HPS faculty in Utrecht, it might be interesting to elaborate on the universities' own actors' observations and appreciations of their faculties, before moving on to a general analysis. The desire to create a more internationally accessible, pedagogical environment and the urge of universities to belong to the top rankings seem to have resulted in the implementation of new regulations and the restructuring of the university's basic structure, in recent

years. In Italy, especially, through the application of, for example, the international bachelor/master division in the Bologna process of 1999, universities have tried to standardize international accreditation. It seems that most of the problems in Italy's higher education system are related to university financing. Higher education institutions deal with overcrowding and insufficient funding; a traditional system of education that has difficulty competing on an international level; a working staff that is made up out of experienced professors but, hardly, leaves room for aspiring youth; decentralized universities that stand in sharp contrast to over-centralized government bodies and a lack of practical education.[52]

In addition, Italy struggles with a shrinking budget and the allocation of sufficient funds to invest in the human capital they need to develop their economy further. As Tommaso Agasisti and Carsten Pohl write in their article *Comparing German and Italian Public Universities: Convergence or Divergence in the Higher Education Landscape:* "In a globalized economy, higher education institutions (HEI) are receiving increasing attention in the political and economic debate because a country's human capital significantly affects its (future) economic development."[53] In times of tight budgets, they argue, it has become increasingly important, in many European countries, to measure and improve the cost efficiency of public institutions, dominating the university landscape. As important as this may be, however, a serious lack of relevant research into the efficiency of funding-allocation of higher education institutions and, in particular, comparative research into higher education institutions across different countries exists – research that is highly valuable when it comes to assessing the relative quality of an institution as well as its progress.

It is, therefore, because of the importance of comparative and cross-country research that Agasisti and Pohl set out to investigate whether and to what extent the comparative efficiency of the use of public spending, by universities in Germany and Italy has developed over time, in within-country and cross-country perspectives. Through the use of a Data Envelopment Analysis model (DEA), they set out to measure the universities' cost efficiency, meaning the *relative* availability of each university to produce outputs – 'relative' in this context indicates that each university is compared with any other homogeneous unit. As such, they set out to analyse how

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[52] (Agasistia & Pohlb, 2012)
[53] Idem.

resources are used and combined to produce products and services. In Agasisti and Pohl's analysis, several inputs and outputs are combined and, even though, several specifications of the DEA model exist which are either input-oriented or output-oriented, the specification Agasisti and Pohl decide to use is output-oriented; they argue that the university, as a decision-making unit "(…) can be assumed to use a given amount of inputs (e.g. number of students, funds) in order to maximize its outputs (e.g. research and number of graduates)."[54] Inputs used by Agasisti and Pohl are 'Students' defined as the total number of students enrolled; 'Staff', defined as the number of professors working at the university, and Expenditures, only those of the given year and including expenditures for professors' salaries. Outputs are 'Graduates', defined as the number of degrees awarded in the given year, and 'External research', defined as the amount of money attracted by the university for research grants and contracts.[55]

Germany and Italy are interesting, the writers argue, because their universities have similar university landscapes and economic terms. Their university landscapes have been, substantially, reformed because of the Bologna process, which urged them to introduce the Bachelor/Master curriculum. As for the similar economic terms, both landscapes show large differences on a national level: higher education institutions in Easter and Western German, significantly, differ from one another, as do institutions in Northern and Southern Italy. German and Italian universities, therefore, provide interesting case studies for research into the extent to which economic circumstances are associated with the efficiency of higher education institutions. Agasisti and Pohl base their research on previous studies that have demonstrated how universities, located in economically disadvantaged regions, represent underperformers in the university systems; Eastern Germany and South Italy are two examples of such economically disadvantaged regions.

Agasisti and Pohl's results show that universities in Germany show higher efficiency in locating public resources and, consequently, instructing their students, as compared to their Italian counterparts. Italian institutions, however, show an improvement of efficiency, developing more rapidly than at German higher education institutions. Interesting to note is that, apparently, the existence of a medical faculty

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[54] (Agasistia & Pohlb, 2012)
[55] Idem.

and a high regional unemployment rate are negatively associated with efficiency, while a positive relationship exists between institutional efficiency and the regional share of workers employed in Science and Technology.

Limiting their research to the years 2001-2007, the two writers find that, by 2007, the universities located in Eastern Germany gained efficiency, whereas their counterparts in the West lost efficiency. The difference in efficiency existing between the two regions, moreover, considered significant in 2001, grew statistically insignificant in 2007. In Italy the development is quite similar. Whereas Northern universities show a decrease in efficiency, Southern universities display an efficiency increase, ultimately, resulting in a regional difference no longer statistically significant. The overall efficiency of the German universities is found, by Agasisti and Pohl, to be higher than the overall efficiency of Italian universities. Twelve universities in total (including both Italian and German universities) are operating on the production frontier and are, therefore, classified as efficient. Nine of these universities can be found in German whereas the remaining three are located in Italy – assuming that all universities operate at an optimal scale. Research into the relative performance of the universities throughout time indicates that, however, Italy shows higher value than Germany. In both countries it appears that the change in so-called 'total factor productivity' is to be attributed, mainly, to substantial technical change and not efficiency change during the years 2001 and 2007.

As illustrated by Agasisti and Pohl's research, universities are preparing to adjust; due to the changing face of European universities and the transition of the university in a, some would say, corporate factory that strives for profit maximization and a leading position in the increasingly influential World University Rankings, an increasing amount of people seems to have grown dissatisfied with the way in which their universities are educating students; allocating funds; 'producing' graduates and treating their staff. In both Utrecht and Bologna, students, staff members and other concerned parties have taken to the street to protest reforms or the current state of the higher education institutes. In the official buildings of Bologna university, students who were previously, respectfully, seated in their class chairs take to the university squares and streets to plead for more funding, a fair allocation of existing funds and better student services. It almost seems a poetic paradox: the more polite and professional the communication between professors and students is expected to

be, the more aggressive and disregarding of etiquette the same students are as soon as they take to the streets. In Utrecht, similarly, the young RethinkUU initiative is urging people to sign a petition that can be presented - and in the mean time has been presented[56] - to the parliament. Aside from the recent occupation of the Maagdenhuis, protests seem to be held, mainly, through well-written manifests, petitions and presentation. In any case "Things have to change!' seems to be a credo chanted in the streets of Bologna and Utrecht. I will, therefore, now, shortly discuss the two respective situations.

Bologna and Utrecht

Bologna has had a long tradition of demonstrations, protests and changing regimes, and has been nicknamed *la dotta, la grassa e la rossa*: the wise city, the fat city and the red city. Wise, because it holds the, presumably, oldest university of the Western world, Fat, because of its rich food and drinking culture and, lastly, Red, because of the color of its walls and, some say, because of its history of communism. The demonstration movement has always been strong, on multiple occasions during the week, students take to the streets and squares to protest new policies, especially those regarding university regulations or student housing. Students put up banners, write down slogans and urge colleagues to go on strike. Parks are used for numerous meetings of students belonging to the Occupy movement and the halls of, especially; the Philosophy faculty, are filled with graffiti, paint and pencil stripes used to convey politically motivated statements. With the 2015's opening of the world Expo in nearby Milano, students have protested the fact that the government seems to think millions can be spent on a world Expo while in the streets of Milano and Bologna, homeless people make a living reselling stolen bikes and cigarettes and students cannot afford student housing.

Students seem to unite through the cause they are fighting for or fighting against. As education is, and some might argue, always has been a 'hot topic' on the political agenda, students often take to the streets to speak their minds and have their voices heard. As such, though the city is divided into separate areas belonging to students of different faculties, students from all departments seem to unite at the

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[56] *this happened during the process of writing this thesis*

many squares, conferences and demonstrations throughout the city. Even though students of the philosophy faculty do not attend university in the engineering part of town, the squares overlapping parts of both areas provide students with a place to get together. In much the same way piazza Verdi, though it is located in front of the philosophy faculty, is frequented by students from all over the city and, especially, it seems, by those willing to voice their opinions or willing to participate in the many demonstrations held. The student associations that do exist are reserved for international or Erasmus students and frequented by very little Italian students. This contributes to the already existing gap between foreigners and locals that seems to characterize student life in Bologna.

In Utrecht, as for the rest of the Netherlands, voices have been heard in recent years that are calling for a change in education and higher education institutes. In the last years, especially, many initiatives have been created to try and bring about changes. In a position paper, published last year, leading men of initiative *Science in Transition* voice their opinions on the current state of the scientific system in The Netherlands. Science, they argue, should be appreciated because of its value for society. Consequently, stakeholders in society should have a say in the production of knowledge. Changes that have been occurring since the seventeenth century, in the relation between Science and Society, have had a significant effect on the university. The organization, financing, and responsibility of the scientific enterprise have become more problematic. One should ask him- or herself, the writers argue, whether or not the enterprise is still organized to our satisfaction. Should we be satisfied with the amount of graduates that universities produce? Are research, publication, valorization, and finances, emphasized too much in university education, now that the government has been pulling away?

Though, some might think that the problems discussed can only be found in the 'Beta sciences', they can be found in the social sciences, too, the writers argue. In their concluding chapter, on the state of education and the university, the Science in Transition'ers argue that the so-called 'Alfa sciences' - despite crucial differences – face similar problems of finance, quality and social relevance. The quality of education is threatened by three developments: the overvaluation of research; the fact that ties between high school and university have been cut; and the lack of financing for the ideal of 'Higher education for the Many' What we, the initiators argue, is systematic

reflection, and debate, on the role of education in our society, led by those who find themselves directly involved: teachers, students, professors and researchers.

Three of the four initiators of *Science in Transition* have a background in HPS, as was brought to my attention by HPS coordinator David Baneke; Wijnand Mijnhardt (history and philosophy of the sciences and the humanities), Frank Huisman (history of medicine) and Huub Dijstelbloem (philosophy of science and politics). Though, it cannot be inferred that the professors' HPS backgrounds are responsible for their role in the *Science in transition* initiative, it is worth noting that the interdisciplinarity of their educations seems to be reflected in the program's core message as, for example, translated in the position paper: problems with the current state of education and the university are related to both the 'Beta sciences' and 'Alfa sciences'; they are put in the context of internationalization, research intensity, valorization and financing and put into historical and philosophical perspective. As all three professors are, furthermore, still actively, involved in the educational and scientific system of the Netherlands - Professor Mijnhardt is, for example, one of the leading professors of the HPS faculty in Utrecht - they seem to incorporate their first-hand experiences and interdisciplinary training into the newly developed and suggested approaches to science, education and the university in the Netherlands.

As for the students of the HPS faculty in Utrecht, most of them seem to be rather satisfied with the way in which the program is organized and carried out. Though, in the beginning of the program, a lot of students still seem to feel uneasy with the teaching methods and small groups of students, the 2014 National Student Service shows that HPS students give their master program a 4.3 average, on a scale from one to five. Their career prospects seem to be discussed frequently; alumni meetings are arranged, information is given on careers on the international website and students are able to attend the UU Careers Day, a day designated completely to the introduction of students to possible workshops, trainings and possible career directions. The UU Career Services, furthermore, offers training in job application, career preparation and CV writing skills. It, furthermore, offers students the possibility of finding workshops that are related to practicing job interviews or career orientation in general.

The city offers a lively environment with a lot of student and study associations. The city does not have a political atmosphere like the one Bologna seems to have. In

general, students seem rather satisfied. Fellow HPS students indicated to be quite satisfied with their study, although some complained about a lack of philosophy and others admitted that the general state of the university ought to be improved. They noticed, for example, that the pressure to produce papers that were publishable sometimes worked to the disadvantage of their education's quality. Additionally, they argued, the atmosphere within the program, although at times very beneficial to motivation, could feel quite smothering at times. Students from other faculties, in Amsterdam for example, where the demonstration culture seems particularly strong, complained about high tuition fees, the disinterest of their professors and recent budget cuts.

Instead of taking to the street, like in Bologna, students tend to develop initiatives, workshops and trainings and circulate petitions and questionnaires - although some exceptions must be made. In 2015, The 'Rethink UU'[57] initiative was created. Rethink UU is a collective of staff and students who feel that the current state of Utrecht University education is below par and should be revised. In an open letter to the university board of Utrecht, the collective listed its complaints and emphasized that the university is focused, too much, on efficiency and finances, resulting in research and education that is solely directed on quantity rather than quality. Because of the lack of funding, students and researchers feel they have to constantly compete with others in the valorization of their work – an attitude that is not beneficial to research quality and integrity. They, furthermore, argue that the academic community has little to no say in organizational issues and is being pushed away by top-down management. Lastly, they state that the supporting staff is suffering from the university's focus on finance, quantity, profit, finances, investors, donations and the institute's international reputation.

In 2015, dissatisfied students in Amsterdam took to the streets and occupied the Bungehuis Building of the University of Amsterdam. Later, they occupied the Maagdenhuis, the administrative centre of the university. The occupants, calling themselves The New University, protested against the current education system and pleaded for a more democratic university. They protested against the university's plans to eliminate all departments with less than 20 students and the new rule that only 3 PhD students would be supported at the same time. The New University

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[57] (UU, 2014)

pleaded for student representation in the university board; a new plan for the allocation of funding and the total abandonment of the initial university policy proposal for 2016. Though the proposal was cancelled and the students promised to leave the building, peacefully, after an additional 48 hours, they were cleared from the building by police and military after one and a half months of occupation.

Though different in method and style, a part of the students, staff and other involved parties of the universities of Bologna and Utrecht seem to have grown, equally, dissatisfied with their universities' results, missions and future plans. Though, it is always easy to criticize institutions from the outside or in comparison to other, possibly familiar, institutes, it is interesting to see that an internal struggle seems to exist as well - in both institutions. It could be, rightly, concluded that there is more to the transmission of knowledge and techniques than a mission and method. In much the same way, in analyzing how a university has been producing knowledge and 'delivering' graduates, it is not enough to take into account the implementations of rules and regulations: certain social, cultural, human and material conditions are necessary in allowing knowledge to be transferred.

Analysis

In his article *Give Me a Laboratory and I will Raise the World[58]* sociologist Bruno Latour focuses his research not on the laboratory itself but on its construction and its position in the societal milieu.[59] As a response to polemics within laboratory studies, Latour sets out to convince readers of the fact that the difference, often argued for, between 'the inside' and 'the outside' of a laboratory, and the difference of scale between 'micro' and 'macro' levels, "is precisely what laboratories are built to destabilize or undo." [60] As such, Latour argues against the widely held opinion that, in discussing laboratories and scientific practice, a difference ought to be made between a macro-structure and mini-structure and that the two different structures, consequently, should be dealt with in different ways and by different types of scholars; micro-structures involving, primarily, individuals and their actions and macro-

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[58](Latour, 1982)
[59](Latour, 1982)
[60] Idem.

structures involving aggregates, populations, social structures and systems. Throughout the debates, the discussions on the movement of scientific disciplines have shifted from opposing 'social influences' to 'purely internal development' to opposing 'public policy' and 'large-scale economic push and pull' to 'micro negotiations', 'opportunism' and 'laboratory folklore' These oppositions, according to Latour, place boundaries on scientific activities and misrepresent what really goes on inside the walls of a laboratory.

Through the example of French scientist Louis Pasteur's rise to fame and the work done in his laboratory, Latour develops his argumentation: "(…)the mere existence of this interest [of journalists, fellow scientists, physicians and hygienists] shows the irrelevance of too sharp a distinction between the 'inside' and the 'outside' of Pasteur's lab."[61] Relevant, according to Latour, is the fact that many parties that often seem uninterested in what goes on inside the laboratory are, actually, part of the same short circuit that involves laboratories, usually insulated and isolated from their attention and passion.[62] The interest of journalists, fellow scientists, physicians and hygienists is not the cause of Pasteur's efforts but, rather, and contrary to what others have argued, a *consequence* of his efforts to translate what they want or what he makes them want: "He who is able to translate others' interests into his own language carries the day."[63]

Latour argues that Pasteur managed to get the attention of so many people by placing himself and his laboratory in the midst of a world that was still untouched by laboratory science: he learned to combine the language of the laboratory with the language of farmers. After constructing a successful dialogue, he transferred his findings and one element that he had found 'out in the field', the cultivated bacillus, to his laboratory - in doing so he drew the agricultural societies with him inside the walls of his workplace. By mimicking the anthrax outbreak on a smaller scale in his lab, people were forced to pass through his lab to solve their problem. In the process, Pasteur developed practical know-how: as his skills accumulated, the crossovers between the laboratory and the farmers' world increased. As such, he was able to imitate the variance of virulence and, as a consequence, his work became increasingly interesting for different parties. To prevent interests from fading, Pasteur decided to

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[61] (Latour, 1982, p.143)
[62] Idem.
[63] (Latour, 1982, p.144)

organize a field-experiment: he wanted to investigate how he could transfer the vaccinations developed in his lab, to 'real-life' situations. In order for him to do so, Pasteur had to extent his laboratory in such a way that it would reach the farmers, without leaving the laboratory behind. The extension, therefore, had to be *an extension of lab science in the field*.[64]

Latour argues that, by overlooking these displacements of laboratories, we run the risk of mystifying scientific activity. By distinguishing between an 'inside' and an 'outside' of the laboratory, work done in the laboratory is represented as a miracle brought to the 'outside' world. This division will, consequently, result in a misrepresentation of reality and of scientific activity: in the case of Pasteur's laboratory the vaccine only worked because the lab conditions were extended and, additionally, the existence of the disease itself and the efficacy of the vaccine were results of the prior extension of a former science. Latour, therefore, argues that Pasteur contributed to the societal forces by creating a new force of which he was the only credible spokesperson: the microbe. To be able to hold on to this position of strength, Pasteur and all scientists in a similar position, for that matter, need to extend their lab - even if this has, as a result, the transformation of an entire society into a laboratory. Science, Latour argues, stops and begins at the laboratory walls.

What is a university like? Is a similar dichotomy made between the inner workings of the higher education institution and its function on a macro level? In a time in which the education system is scrutinized by many, in both Italy and the Netherlands, many voices argue that the university is no longer living up to its potential. The pedagogic environment is no longer adapted to the needs of society and, as such, falls short of performing its duties: educating new generations of professionals, researchers and students ready to take on valuable roles in society. Though much has been written on the replication and spread of laboratory techniques, on the one hand, and processes of teaching and generational shift in science, on the other hand, the intersection of these themes seems to have been less of a concern to researchers.

As mentioned before, in David Kaiser's *Pedagogy and Practice in Science*[65] a number of essays are compiled, written by different scholars, that are concerned with

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[64] (Latour, 1982)
[65] (Kaiser, 2005)

the relationship of education, science and technology and the way in which they intersect. Specifically, the role of education in the transmission of a specific set of competencies and skills, within an academic community, is discussed, as are the different ways in which professionals transfer their experience, knowledge and other elements of their professional practices onto new generations of researchers and students. The manner in which scientists' and engineers' training shapes their careers and research and the way in which scientific training relates to the content of science are central themes in the compiled essays.[66] This last part is of special interest to my research. I will now, therefore, offer an analysis of my observations made at the History and Philosophy of Science faculties in Bologna and Utrecht.

Interactions

A substantial difference between the two masters can be found in the manner in which students and teachers interact with one another. In Bologna, the relationship between professor and student seems very professional and strict. Interaction between the two is reserved for the hours of ricevimento and, even then, a more informal atmosphere does not seem to be created; student and professor are seated opposite from one another at a desk or at a coffee table. Upon entering, students are used to shake the professor's hand and usually great him or her with a polite 'Salve'. After the initial greetings, a short conversation of not more than fifteen minutes will follow in the office, provided more time has not been requested beforehand. Some professors and students might be able to construct a more informal relationship but in general the relationships seem to be kept professional. In Utrecht, the contact seems different. Students are able to request a meeting via e-mail, quite informal, and are invited to the professor's office or, if not available, to a small coffee or conference room. Depending on each student and professor, relationships seem less strict and personal. Students are seated in comfortable chairs next to, or opposite from the professor. As the age difference between professors and students in Utrecht is, significantly, smaller than the average age difference in Bologna, relationships seem to be based less on authority and more on a more subtle hierarchy.

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[66] (Kaiser, 2005)

In Utrecht, the form of cooperative research is advanced; students and professors work together and discuss matters not only through writing but in person. They work, for the most part, in the same place, collaboratively.[67] The PBL system requires students to read articles and papers from all around the world and, as the work is shared by all participants of the class, the content is discussed and talked about in seminars and group meetings. If a fruitful ending to a discussion has not been reached, the discussion is, at times, picked up in a later class or meeting. As the goal of the classes and seminars does not seem to be 'coming to the same conclusive answer to a question' a new idea is only the start of a new discussion and a new division of work and literature. As such, the process of comparing findings and results, discussing them and coming to new insights, is repeated throughout the semester.

Though, in theory, the PBL system inspires cooperation and group participation, in practice, it often proves quite challenging. For a discussion to run smoothly and productively, both students and teachers have to be able to adjust to the very subtle, social dynamic of each group. In some groups, the discussion benefits from a professor participating as a fellow student, whilst other groups are in need of a stronger hand. Similarly, some students seem to be able to cooperate naturally, while in other groups a balance needs to be found between the individual students' needs and attitudes. It seems to be problematic, therefore, to figure out in what way a group of students and professor can best work together. Because of the critical nature of the discussions, students do not seem to, blindly, accept what is said. They, rather, seem to share the idea that everyone should be able to speak their mind freely and that, therefore, no opinion should be ignored and no one ought to be abruptly caught off. Because of the internationality of the students, furthermore, the method and atmosphere of the classes seem to promote the discussion of various different and interdisciplinary approaches. Seminars are remarkably informal; participants contribute to the discussion without deference to formality or etiquette. As such, since HPS students come from other parts of the Netherlands and from abroad, collaboration not only crosses city boundaries but national ones, as well; students coming from abroad bring with them experience and connections that can be traced back to their home institutions.

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[67] (Ito, 2002, p.165)

Due to the rather informal relationship between students, professors and students and professors, fruitful discussions do not seem to be limited to classes and seminars. Break and lunch rooms, as can be found at the university and in the libraries, seem to provide students and, sometimes, professors the possibility of proceeding with earlier discussions. On many occasions, professors will walk out of class together with students and recapitulate what has been discussed earlier, in class. 'Chatting', seems to be an integral part of the dynamic between students and professors. In the lunch rooms, students group together with books and sandwiches to either prepare or discuss class meetings and to strategize for papers that are due. At the office buildings, in which most professors have their offices, a similar atmosphere seems to exist. Professors seem to have an open door policy, not only for their students, but for their colleagues as well. Because of the central position of the coffee machine, furthermore, encounters are not reserved for the office; here professors meet and have the opportunity to discuss their day.

In Bologna, leadership plays a different, but not less crucial role in students' education. Professors, in Italy, in general – that is, those professors with a permanent position at the faculty - are, on average, older than most professors in the Netherlands. This difference is illustrated by the two HPS faculties; the professors working in Bologna seem to be significantly older than the staff of professors at the HPS faculty in Utrecht. Due to the long selection process, aspiring professors spend years trying to obtain a position at a university. In the mean time, the lucky ones end up with a paid assistant or lecturing job. Others go on to teach at high schools, private schools or elementary schools. Those who have their eye set on a job within the university and are in the position to sustain themselves, financially, take up an unpaid assistant professor position. Though, this job does not provide financial security it does increase the chances of a graduate climbing the ladder within the university. Others combine an unpaid position with a part-time teaching job or research fellowship, while waiting for a paid position to open up at the university.

Once a professor, therefore, is instated, he or she will have beaten all other candidates in the national and local competitions, gained years of experience in academia and will have published a significant amount of papers. Because of this, a professor, at the start of his or her appointment, is, on average, relatively old but very experienced. Professors, moreover, in general, seem to not be replaced until their

pension, provided that they have not been fired, have not resigned or have not fallen ill. As such, professors hold their position at the university until they are 65 and, often, even after. If master programs are to be expanded or the number of courses is to be increased, additional professors are not hired but professors' individual workloads are increased. [68]

Traditionally, in Italy, age seems to be an indicator of experience and authority. Though professors are paid poorly compared to other professions [69] they seem to be kept in high regard. At university, therefore, they have a position of authority that is translated into classical teaching methods in class. As discussed, students of scienze filosofiche attend lectures and seminars that are supervised by professors and, sometimes, supported by assistant professors. In these lectures, possible discussions or questions are left till the end of the class and are, therefore, often postponed due to a lack of time. In a way, the professors at the faculty are seen as paternal or maternal figures that are responsible for the passing on of their knowledge. The management of the class, therefore, is much more patriarchal, as compared to the subtle management of classes in Utrecht and can, probably, be best explained as being a reflection of Italian society as whole – in which family bonds; a strong national identity and respect for the elderly are cornerstones. Though, within Italy, a divide seems to exist between those who live in the south and those who live in the north – emphasized by the size of the country - to the outside, Italians seem to have a relatively strong sense of national identity.

The family seems to function as a close-knit community, whether members particularly get along with each other, or not. Not all students move out to go to college or university, though it differs from one family to another, many students only leave home when it is absolutely necessary. This is, in part, motivated by the fact that students do not receive student financing, like in Netherlands; life in student houses has to be financed either by the family or by the student him- or herself. The Italian culture is very specific; Italian food, Italian 'aperitivi' and even Italian dinner times are strong indicators of the Italian national identity. In a lot of cases, children seem to take over the family business or are asked to work at their parents' studio or practice. In the smaller cities, professors might be longtime friends of students' parents or

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[68] (R.C. Simonini, 1954/1955)
[69] Idem.

families. Education is classical; students are expected to not only obtain a vast amount of formal knowledge but, additionally, a set of norms and values compliant with society. At primary, medium, high school and university a paternal hierarchy exists – a hierarchy that can be found not only within the walls of the institutes but in family life and Italian society as well.

Dutch society seems characterized by slightly different values. In the Netherlands, the population is relatively international. The country prides itself with its 'liberal' and 'tolerant' foreign policies, whether or not these are actually as tolerant and liberal as they are believed to be, and the country has, for centuries, attracted foreigners, entrepreneurs and artists in search of 'freedom'. Compared to the Italian food culture, typically 'Dutch' food is hard to find, if it exists at all. Typical Dutch dishes do exist but people do not, necessarily, seem to identify with them as much. A similar divide between the southern parts and northern parts of the Netherlands exists but since the country is significantly smaller than Italy, the divide is less emphasized through the country's geography. Children, in general, seem to be urged to grow up being independent and self-sufficient. They are expected to be able to fend for themselves and, often, move out of the house after high school - though this, obviously, differs from one family to another. Family life is important, though it does not seem as important as Italian family life. It is not uncommon for students and other citizens, for that matter, to move abroad. Nor is it strange, for people to migrate or decide to raise their children in a different country – as children, from a young age on, are familiarized with different languages and cultures and, in general, are more flexible in learning new languages, it is possible for families with young children to start a life somewhere else.

Though, curiosity and eagerness are integral part of both master programs, they seem to be integrated in slightly different ways. Whereas, in Utrecht, professors seem to eagerly participate in and contribute to discussions, not only in the role of supervisor but almost like participants themselves, professors in Bologna seem to be much more restrained and are, almost exclusively, focused on guiding the students. It could be argued that the PBL system, as it is used at the University of Utrecht, would be impossible to implement at a university like the one in Bologna, because of the large number of students attending the program; 253. It would be easy to argue, therefore, that simple practical considerations stand in the way of implementing the

PBL model. At the University of Utrecht, however, other faculties with larger student populations have, indeed, decided to try and implement the PBL system. At the faculty of the Humanities, for example, the PBL model is maintained, despite its significantly larger student population. Practical considerations, therefore, would fall short of explaining why, in Bologna, a more traditional approach to classes has been decided on.

In Utrecht, furthermore, the HPS group seems to participate in various other activities related to the program. Groups of students and assistant professors travel together to conferences in other cities. Many formal and informal 'borrels'[70] are held throughout the year and it is not uncommon for professors to join students in a celebratory drink at the end of the semester. Master classes that are held abroad, moreover, are attended by both students and professors and, additionally, study trips are organized by the student representation and the Descartes Centre. It seems that, especially on these trips, the bond between professor and students, as well as between students, grows closer. This combination of curiosity and the value of collaboration seem to result in an 'informal collaborative style if scientific research' where research is conducted "(…) like a team sport, with similar enthusiasm, competition and cooperation."[71]

Though, in Bologna, extracurricular activity is encouraged by some professors in the form of, for example, a drink after the semester's closing; these activities seem to be more of an exception than a rule. Apart from the substantial difference in the number of students in Bologna and Utrecht, respectively, professors and students seem to prefer to maintain a more professional relationship with each other, at the faculty of scienze filosofiche. Once again, this depends on individual professors and students, as some relationships seem to be less formal but, in general, the atmosphere seems to be quite professional. The relationship between professors seems to be just as formal. When asked about their relationship to colleagues, most professors indicated that a rather formal rapport existed between colleagues, though, in some cases, professors who had known each other for quite some time seemed to have built somewhat of a friendship. This rather formal understanding between professors seems to be emphasized by the location and arrangement of their offices. Though all

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[70] Small informal gatherings of people in which small amounts of food and drinks are provided – 'mix and mingles'
[71] (Ito, 2002, p. 163)

professors, belonging to the same department, share offices at the same floor or in the same building, they seem to keep their doors closed. As professors work on their publications and books in their offices, the open door policy that characterizes the work environment at the HPS faculty seems non-existent at the University of Bologna – nor does it exist at all other faculties of the University of Utrecht.

As such, at the scienze filosofiche faculty of the University of Bologna, the relationship between professors and students seems much more formal. In Bologna, yearly meetings group together all professor of the department in the discussion of new teaching strategies or curriculums but professors, when asked more personal questions, such as "Do you often lunch together?" or "Does a professors' carpool exist?" seemed to, often, refer back to the fact that 'it is different for every individual professor'. In the halls of the university, at times, professors can be seen walking together to their neighboring offices. More often than not, they can be seen coming out of each other's offices before the start of the ricevimento. If a more informal relationship would exist between colleagues, effort has been put in to try and not let it show.

Tacit and formal knowledge

Though, in both pedagogical environments a productive atmosphere is created, the methods through which the atmospheres are created seem to differ from each other. In both groups, the eagerness to gain insight into philosophical, theoretical and scientific issues is great; in Utrecht, however, discussions seem to be aimed at finding new ways of approaching problems, rather than at finding a definite answer to discussed issues. In Bologna, classes seem to be aimed at reaching an agreement on what is essential to take home from philosophical treatises and articles, rather than on students' research skills. Texts are discussed not to develop problem-solving skills but, rather, to develop skills for reading texts thoroughly and extracting the main argument(s). The exams emphasize this difference even more; in Bologna students seem to be judged on their ability to recount what has been said in class whilst students in Utrecht are tested on their writing and their ability to construct an argument through the accurate use of relevant literature.

As such, it seems that students in Bologna ordain a vast amount of factual knowledge; they are able to recreate arguments by heart and have studied at the end

of their master, in theory, a great amount of literature that they are able to analyze through their professors' notes. Their research skills, however, are trained to a lesser extent and their thesis is more of a literature study rather than a research project. In Utrecht, however, students are trained in their presentation, research and writing skills, through the writing of exams, the holding of presentations and the training they receive in research and writing. Their factual knowledge, however, seems to be gathered, only, through their respective, personal specialties. Because of the possibility to choose the majority of their courses in Utrecht and even at other universities, HPS students in Utrecht might possess a vast amount of factual knowledge on issues related to their chosen specialization, which might very well coincide with other students' specialties and interests, but in general, HPS students are only guaranteed, in theory, to share the knowledge obtained in the three compulsory courses.

The difference might best be explained through the concept of formal and tacit knowledge. In his article *Instruments of Training: The Growth of American Probe Microscopy in the 1980's*[72] Cyrus C. M. Mody analyzes the replication and spread of laboratory techniques and the interweaving of replication issues with pedagogical environments, through the discussion of the development of scanning probe microscopy in corporate research labs and academics in the mid 1980's. His focus on the roles of tacit and formal knowledge in experimental settings results in a discussion of how "(…) pedagogical imperatives shape the boundaries between tacit and formal knowledge"[73].

Tacit knowledge, as phrased by sociologist Harry Collins[74] in his discussion of the transmission of skills, is often defined as a "[S]kill-like knowledge, which travels best (or only) through accomplished practitioners." Collins argues that it cannot be "fully explicated or absolutely established," and that it is "invisible in its passage and in those who [possess] it." Tacit knowledge, he argues, is impossible to write down and can be transferred, only, through social interaction; it only has meaning in its context. Moreover, it is not something anybody can just learn; often it is impossible to ascertain whether or not you have learned it at all: "To ascertain if you possessed the proper tacit knowledge, you had to be accountable to some community, some set of

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[72] (Mody, 2002)
[73] (Mody, 2002, p.209)
[74] (Collins, 1985)

practitioners who negotiated what counted as good practice."[75] Formal knowledge, Collins argued, can be found "in books, expressible purely in symbolic forms, [and] could be transmitted unproblematically, survived apart from the contexts of its origins (indeed apart from any context at all)."[76] New knowing subjects and new generations of students and professors can, thus, be created in very different ways.

The pedagogical environment as observed in Bologna could, perhaps, best be described as an environment promoting the transfer of formal knowledge. For students and professors, knowledge that can be found in books and that is valuable for publishing, constitute both the means and the end of their study. Though tacit knowledge is still valued and discussions, seminars and presentations are promoted, to a certain extent, skill training seems to be subordinate to formal knowledge. Moreover, the formal knowledge promoted and transferred seems to bind embodied skill, limiting critical activity – if, for example, the formal knowledge dictates that a certain approach would not work, it would seem useless to try.[77] Students are, however, extensively trained in their reading skills and learn, early on, how to reconstruct arguments and discussions. The formal knowledge they acquire throughout their studies, enables them to use a vast body of reference material in class. A network is constructed of actors that pass on and, virtually, *recycle* tools and knowledge, using specialists to clarify local meanings.[78]

In Utrecht, tacit knowledge seems to precede formal knowledge in importance and application. Practical skill and informal understandings are used to approach issues and solve problems, including some skills that still need to be developed. To train and develop these abilities, students are trained through a variety of activities, experiences and disciplines and, as such, taught how to attain goal-oriented skills and a general, tacit, knowledge of how to approach future problems and obtain further skills. To accompany the acquired tacit knowledge, students are urged to study literature belonging to the different disciplines and are required to write reviews of established works in the history and philosophy of science. To prevent the tacit knowledge from being too tied to context and, therefore, making no sense to the external community, resources, tools, and specialists are pulled in to construct new

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[75](Collins, 1975, 1985)
[76] Idem.
[77] (Mody, 2002)
[78] (Mody, 2002)

dialogues to be circulated. As such, a network is constructed of different kinds of knowledge- and tool-exchanging actors.[79] The amount of formal knowledge students in Bologna seem to have obtained, however, seems much more extensive than the one obtained by students in Utrecht.

Pedagogy of Diminishing Returns

Even though two different types of knowledge seem to be at the heart of instruction at the respective HPS faculties of Bologna and Utrecht, a focus on obtaining one of them, or any specific type of knowledge could be harmful. In his *A Pedagogy of Diminishing Returns[80]*, namely, Hugh Gusterson argues that "[p]aradoxically, the more elaborate, drawn-out and formalized (…) pedagogy has become over the years" and the more extensive the general understanding of a field of study has become, the more pedagogy becomes problematic.[81] Though those who have written the literature being studied and used in the master programs may have collected and registered their findings as they went along, creating what some would call 'breakthroughs' in their field of research, the new generations seem to need much more time to consider themselves experts, or expert enough. The new generations of researchers and students seem to achieve less, in a greater amount of time, spending years in the field publishing articles and commentaries on established literature, without achieving what they might have hoped and aimed for, initially.

The emphasis on formal knowledge, as observed in Bologna, might result, or might have already resulted in pedagogy of diminishing returns. Literature is studied and analyzed to a great extent and students are taught to reproduce that knowledge in their exams, theses and presentations. Their individual research is centered on a detailed analysis of a chosen work, as is their graduation colloquium. Though many students seem to work hard; succeed in achieving very high grades and deliver well-written theses, a significant part of them seems, slightly, discouraged. Though a number of professors have set an example by travelling around the world and holding conferences and teaching positions at various internationally acclaimed institutes, this

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[79] (Mody, 2002)
[80] (Gusterson, 2002)
[81] (Gusterson, 2002, p. 98)

is hardly common.[82] The long process of ending up at a university appointment, a big part of which does not offer financial security, provides students with bleak prospects. In addition, the hope of achieving academic and international acclaim or fame often seems childish, as students soon learn that the road to recognition is long and hard. As mentioned before, students can increase their chances of finding a good job by making valuable connections and establishing a network early on in their studies. By getting top grades and being noticed by professors, either because of a perfect attendance record or active participation in class, students have a shot at being recommended or referred to potential employers after their graduation.

In Utrecht, albeit somewhat different, a similar atmosphere seems to exist. Though students seem to be involved, to a greater extent, in the success stories of their professors, their training emphasizes tacit knowledge and, as such, to a lesser degree the obtainment of formal knowledge. Though students of the HPS research masters are trained with a specific professional community in mind, they seem to stand less of a chance finding a job outside of the community. In addition, the professional community that is aimed at, mostly consisting of those seeking a job in academia, either through a PhD or fellowship, is a tough one to penetrate. The research master proves very valuable in making the contacts and network needed to succeed: early on, students seem to realize that to try and make it after graduation involves more than just getting good grades: they need connections and windows of opportunities. Similar to the situation in Bologna, students have a higher chance of finding a job after graduation through the personal recommendation of a professor or any other valuable contact they have made throughout their studies. Many HPS students will find, or are forced to look for, work outside of the Netherlands. As History and Philosophy of Science is the only research master of its kind in Europe, competition is fierce. In addition, PhD positions at the home university are scarce – as the field is relatively small in the Netherlands, the few positions that are available seem to, often, be filled, quite fast. Students hoping to be considered for a job in academia, therefore, need to open their minds to the possibility of moving abroad.

To assess to what extent Bologna graduates believe their education was valuable in finding work after their graduation, a survey of three groups of scienze filosofiche graduates was conducted in which the graduates were asked to answer

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[82] (Rosier, 2015)

questions about their study, its use and in how far it contributed to them finding a job after graduation. The groups consisted of students who graduated in 2013, 2011 and 2009. Their average age at the time of their graduation was 27, 27.5 and 26, respectively, and the average years needed to graduate 3.1, 3.0 and 2.8, indicating that the majority of students did not manage to graduate in the two years, originally, set out for the scienze filosofiche laurea magistrale.

Most students, moreover, chose to continue their education after graduation from the scienze filosofiche master.[83] 7%, 9.2% and 8.3 % of the, respectively, 2013, 2011 and 2009 graduates said to have chosen to do a specialization after their graduation. 4, 2%, 9.2% and 2.8% of the respective graduates chose to a level 1 master program. Another 8, 5%, 3.9% and 19.4% of the graduates chose to do a level 2 master and 12.7%, 14.5% and 13.9% indicated to have chosen another type of master program. Additionally, 7% of the 2013 graduates, 14.5 & of the 2011 graduates and 36.1 % of the 2009 graduates said to have started a Dottorato di Ricerca. Those who did not decide to continue their studies were asked what their post-graduation situation looked like. When asked whether or not they had been working since their graduation, 36.6 percent of the 2013 graduates indicated to have found work, as did 60.5 percent of the 2011 graduates and 63.9 of the 2009 graduates. Consequently, the majority of the 2013 graduates, 63, 4 percent, did not find work, yet, in 2014. 19, 7 percent admitted to have not been looking for work, of which 5.6 percent admitted that the reason for not looking was the fact that they were enrolled in an internship or university specialization. 43.7 percent of the graduates, consequently, were jobless, even though, all of the students belonging to this group admitted to have been looking for work at the time of the survey. 40.8 percent of the students without a job in 2014 indicated to have not been able to find work since their graduation in 2013.

Only 15.4 percent of those who did find a job and were working in 2014 had managed to get a full-time contract. On average, 2013 graduates started their job search 1.4 months after their graduation, and needed 4.2 months to find a suitable job. In total, it took 5.8 months after their graduation to start their job search and successfully find work. Of those who managed to find a job, 30.8 percent decided to take up the work they had been doing prior to their laurea magistrale, whereas 26.9 percent decided not to. Only 3.8 percent of the graduates took up the work they had

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[83] (unibo, 2014c)

been doing *during* their laurea magistrale. The majority of the students, 38.5 percent, of all working graduates in 2014, indicated to have started looking for a job only after they had graduated. The major part of the 2011 and 2009 graduates, however, has admitted to be working, though almost a quarter of the graduates, 22.4 percent, seem to be, still, looking for a job.

In Utrecht, despite the fact that extensive information on graduates, their post-graduate life, possible job hunts and their overall appreciation of their HPS training is not available - although a project to gather such information has been planned for the summer - most graduates seem to pursue a career in academia. In a 2013 listing of HPS alumni and their careers[84] it becomes clear that 22 of 48 alumni have pursued and/or completed a PhD. Of the remaining 26, the majority (7), indicated to be working at a university or other educational institute (university, college or secondary school), another 7 said to be doing a traineeship, one graduate is working in software, one at a museum, another one in ICT, two in management, two in consultancy, one in politics, another on in cabaret and of three graduates job situations remain unknown. From this list is seem clear that most HPS graduates stay within academia, Moreover, 9 of the graduates have worked or are working at the University of Utrecht - another two are working at one of the official university partners of the University of Utrecht and 11 at one of the other prominent Dutch universities (Twente, Groningen, Amsterdam, the Free University of Amsterdam, Leiden and Nijmegen). The remaining positions have been filled at universities abroad; the Universities of Vienna, Brussels, Ghent and Mexico and LSE.

Though, more information is necessary to paint an accurate picture, the available data seem to indicate that the vast majority of HPS graduates continue their work within the academics and, more specifically, within the context of a higher education institute. The majority of these graduates, furthermore, choose to do a PhD, take up a teaching position or conduct independent research. A significant amount of graduates, moreover, has indicated to have stayed at the University of Utrecht – the remaining graduates have chosen one of the other Dutch universities or have moved abroad. Compared to the graduates of scienze filosofiche, the HPS students of Utrecht primarily stay within the community of their master.

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[84] (coordinator, 2013)

This would imply that students who are trained at the scienze filosofiche faculty in Bologna are not so much trained to be able to function within a specific community – though the opportunity does exist – but are given the chance to obtain a vast amount of knowledge useful in many different disciplines. Though, students who would like to pursue a doctoral degree have the opportunity to do so, many graduates have indicated to have found jobs in disciplines that are not necessarily bound to the scienze filosofiche community. Due to the fact that the emphasis in their education lies on the obtainment of formal knowledge, students seem less tied to the practices and skills of a specific group of practitioners and/or scholars but are, rather, taught how to use their knowledge within different contexts. They are not, specifically, taught that collaboration is the key to success, nor are they subjected to the informal communication of members within a specific community; though, they are trained in reading and analyzing, they do not seem to be made familiar with a specific way of writing and publishing articles that is necessary for entering a specific work climate.

It seems that students are trained to be individual authorities on specific topics and are urged to absorb as much knowledge as possible. They are taught how to address authoritative figures, to ensure a steady climb to higher positions and, in accordance with daily conduct in the professional sphere in Italy, made familiar with appropriate behavior within a hierarchy. As such, though it does not seem as if they are trained, specifically, with a specific community in mind, students are taught how to behave appropriately in a wider context and become 'one man educated armies'; easily employable and armed with a vast body of knowledge useful in various professional sectors.

In Utrecht, in a somewhat different way, students seem to be trained to be a part of a specific scientific or academic community. The major part of their education is directed at training and developing important research and writing skills that enable students to write acceptable articles that can be distributed and published. As emphasis lies on the obtainment of tacit knowledge, the formal basis students take away from their education is relatively weak as it is not, always, necessary to have a lot of 'ready hand knowledge' to be able to function within a given community. Instead of being able to recite literature, students are given the tools to quickly find relevant and reliable literature and are taught how to correctly reference it. Armed with skills and tools they are taught how to best use their resources and other people's resources

to create new results and insight that are accepted as valuable and progressive in a specific community Thanks to search machines and institutional databases and the fact that students are trained in using them, accurately, primary attention is given to how to work with literature once a student has found it. Even though the language of instruction is English, in light of the faculty's international focus, hardly, any original texts are discussed in depth; let alone in their original language. Because of the diverse backgrounds of students, individual students might choose to read certain literature in their mother tongue but in classes language of instruction is, always, English – with the exception of classes in which all students are Dutch and professors might choose to conduct their classes in Dutch.

In addition, due to the relative, informal, communication between staff members and students, students are, relatively early on, taught how to interact, appropriately, within a given scientific community. As all professors and PhD students are directly involved in the community - as are, by default, the students - the informal coffee room chitchat, lunch breaks and borrels in which topics ranging from the neighbor's wedding dress to Kuhn's *Structure of Scientific Revolutions* are discussed, students are familiarized with the chatter necessary to penetrate the community, post-graduation - as the faculty is small, faces are, easily, remembered and so are attitudes. Outside of the community, however, students seem to have a hard time finding a job. Though interdisciplinarity is currently very popular, students do not have sufficient qualifications to fulfill positions in other, more specific, disciplines. Disciplines such as History, Philosophy and Natural Sciences might accept an HPS student because of his or her specific training but even in those neighboring disciplines requirements indicate specialized training in specific fields. As positions are, furthermore, often filled through internal recommendations, it is always a challenge for graduates to find a position outside of the institute or discipline – though it can be argued that this is, in part, due to a lack of available jobs and internal policy, rather than the quality of the graduates. It is, furthermore, a situation that can be found in both Bologna and Utrecht.

Social Status

To understand in what way a specific kind of training can have its bearing on graduates' defining credentials, I would like to discuss Graeme Gooday's article *Fear, Shunning and Valuelessness: Controversy over the Use of "Cambridge" Mathematics in Late Victorian Electro-Technology[85]*. In this article, Gooday sets out to research the way in which *training* can be central to the articulation of new, multifaceted disciplines and the defining of proper credentials for its practitioners, through the example of "Cambridge" mathematics in Late Victorian Electro-Technology. Throughout the last two decades of the nineteenth century, many scholars involved in fields such as physics, civil engineering, mathematics and electricity were eager to get a piece of the, then, latest new "'hot" field of electrical engineering. Through the combination of their own expertise and possible developments in the potentially lucrative domain of electrical engineering, practitioners hoped to make important and fundamental progress in their field as well as the new field of electrical engineering. Deciding which kind of training and which practitioners were best suited for confronting the many theoretical, political, practical, political, technical and commercial problems stumbled upon in electrical engineering, proved difficult but of crucial importance. Many disagreed on the training, necessary, for handling the complex and, often, unprecedented phenomena involved in electro-technology.[86]

Gooday focuses specifically on a "(…) sometimes heated argument about how to theorize the performance of one important but recalcitrant electromagnetic technology: the a.c. generator commonly known as an alternator."[87] Through this example, he investigates the specificity of John Hopkinson's training as a Mathematics graduate at Cambridge in the formulation of his controversial theory of alternators as opposed to the more 'practical' training of engineers who seemed more familiar with the operation of machinery and had received training in technical colleges and workshops. The methods and techniques used to articulate Hopkinson's theory were, as a result of his Cambridge background, intelligible only to fellow Cambridge mathematics graduates or others with similar university-level training.

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[85] (Gooday, 2002)
[86] (Gooday, 2002)
[87] Idem.

These graduates were used and trained to seek "(...) neat analytical equations within a mechanistic paradigm."[88], whilst the "practical men" feared these simplifying assumptions would lead to error when put into practice. As such, these engineers preferred to use, perhaps, less accurate but more reliable methods to analyze alternator performance.

The dispute that, as a consequence, developed between Hopkinson is significant in understanding what it meant to be a Cambridge mathematicians, at the time, and in understanding the way in which training in the new field of electrical engineering was developed. Though, Hopkinson's training does seem to have played a role in his confrontation with "the men of practice", the dispute should not, Gooday argues, be explained, exclusively, through the undergraduate training Hopkinson received at Cambridge. Even though, at the time, few questioned the credibility and quality of the late Victorian theories on electromagnetism and thermodynamics formulated by Cambridge mathematicians, Hopkinson's conflict with the practical practitioners should be explained, as well, through his idiosyncratic method of employing Cambridge mathematics and his early reluctance to cooperate with "practical" engineers – rather than through a dichotomy of practice vs. theory as, supposedly embedded in the Cambridge mathematicians and 'men of practice'. By comparing John Hopkinson to one of his contemporaries, James E. H. Gordon, Gooday argues that despite their similar Cambridge education, they developed different methods and approaches to the new field of electro-technology.

James E. H. Gordon, Gooday argues, although a fellow Cambridge mathematician, seemed more prepared to incorporate the artisanal wisdom of the "practical" engineers and, as such, was able to develop practical forms of alternator technology with the help of his technical engineering workshop assistants. Through the work of Ido Yavetz[89], Gooday shows that the opposition between practice and theory that seems to be common in late Victorian electrical engineers' talk should be seen as a "partisan representation of a complex socio-professional tension – not a literal fact."[90] Yavetz argues that this kind of labeling is context-specific and that controversies should be understood in light of the extent to which an individual has been molded by his or her prior training. As such, methods and theories should not be

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[88] (Gooday, 2002)
[89] (Yavets, 1993)
[90] (Yavets, 1993)

judged on their inherent virtues per se but, rather, on the extent to which they reflect the successful strategies that have been extended through the individual's prior training. The different approaches taken by 'the men of practice' and the Cambridge mathematicians as well as the self-identification with their specialties might have been, therefore, consequences of the ways in which their training instilled upon them an idea of successfulness of some methodologies, rather than others. Pedagogy, therefore, could be considered as the "(…)institutionalized means of extending successful strategies for theorizing machines to future generations of practitioners."[91]

In Andrew Warwick's account of nineteenth-century mathematics, furthermore, it is argued that such theorizing processes were 'practice-laden' and learned in manners localized to specific training regimes, something that seems to go directly against Kuhn's famous account of globally current paradigms. According to Warwick, the theorizing activities that practitioners perform are molded by sets of well-rehearsed problem-solving strategies and techniques. In the context of Cambridge mathematics, he argues that students were taught to apply an established and conventionalized mathematical order to 'practical' or material situations. As such, the common exemplars in their educational canon were decisive in the construction of their disciplinary identities. He argues that mathematics graduates who did not attend the University of Cambridge had trouble solving problems characteristic of Cambridge Mathematics – "(…) even when presented with complete specimen solutions to such problems.[92] Warwick, furthermore, argues that, in contrast to Kuhn's concept of the long-term significance of education, the training that Cambridge mathematicians received enabled them to extend the solutions to problems they had been made familiar with, to new situations. The specifics of the Cambridge mathematics education and examination even went as far as incorporating the conventional examination settings; solutions to problems were required to be analytical, elegant and concise. Topics that did not allow such answers or invited students to come up with overtly approximate solutions were avoided as students were expected to deliver answers and solutions that fit right in with the learned exemplars and required form of answers. [93]

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[91] (Gooday, 2002; Yavets, 1993)
[92] Idem.
[93] Idem.

Though it is hard to infer whether or not the examiners intended for their problem-solving strategies to be applied, directly, to new situations and practical contexts, Gooday argues, that it was, in fact, precisely what Hopkinson did on several occasions. Throughout his career, Hopkinson employed strategies and problem-solving techniques, even many years after his graduation, that can be considered copies of the ones employed by the Cambridge examiners. Even though, he did try to adopt techniques with which non-Cambridge graduates were more familiar, his manner of doing so was, often, unclear. The fact that he, overtly, showed his discontent with the other techniques of graphical analysis, furthermore, did not help in getting his message across.

As many specialists sought to reconcile Hopkinson's Cambridge approach to electrical engineering, on the one hand, and the graphical tradition of electrical engineering on the other, it soon became clear that Cambridge mathematical theory, although internationally acclaimed and accredited, could not, alone, account for the developments in the field. Hopkinson's way of approaching the practical problems with the alternators at the time and the language in which he verbalized his ideas were increasingly challenged by experts who had not been trained in Cambridge mathematics. These experts argued that Hopkinson was falling short of accounting for what could actually be achieved in practice. Hopkinson spoke, for example, of parallel running alternators whereas, in practice, it was, virtually, impossible to run the alternators in parallel - as one young engineer noted: "Until it had been proved in practice, this [Hopkinson's] language of equations convinced nobody."[94] The daily familiarity that engineering experts had with the alternators proved highly valuable in gaining insight into the complexity of the machines and their use in the world of electromagnetic machinery; it, furthermore, allowed specialists, or 'practical' engineers to be able to quickly challenge the highly theorized Cambridge mathematical analyses that seemed to lack a certain engagement with the material world of electrical engineering.[95]

In no way, however, is it possible to infer that training in Cambridge mathematics, necessarily, led every electrical engineer into a confrontation with 'practical' engineers. To support this argument, Gooday argues, through the example

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[94](Gooday, 2002)
[95]Idem.

of scholar and fellow Cambridge mathematics graduate, James E.H. Gordon, that electrical engineers with a Cambridge mathematics background were, indeed, recognized by the electrical engineering community as productive contributors – interestingly enough "(…)despite (rather than because of) their high level of educational attainment."[96] James E.H. Gordon, for example, acknowledged that training in Cambridge mathematics did not, necessarily, make for quality engineers and he, therefore, gathered a team of 'practical men' who could compensate for his lack in skill and insight into daily practices. He, initially, tried to parallel the alternators in the way in which Hopkinson had described it in his controversial alternator theory but chose to abandon it as he realized the idea was hard, if not impossible, to put into practice. He, rather, decided to stick to the conventional way of letting each machine operate on a separate circuit.

The discrepancies between Hopkinson's alternator theory based on qualitative and quantitative analyses on the one hand and the actual performance of the machines on the other, illustrates how both Hopkinson and the engineers he found himself in confrontation with, fell short of accounting for the entire phenomenon; the sophisticated approximation procedures in the theorizing of alternators, characteristic of the Cambridge Mathematics training, provided a body of theoretical knowledge that had not been made accessible to the 'practical' engineers, whilst the graphical methods of the engineers offered a way of capturing the contingencies of alternator performance that were not and, perhaps, could not be accounted for by the Cambridge trained mathematicians. Only through the combination of the two, by James E.H. Gordon, cooperation was established; as such new insights were gained in the world of alternators and, as a consequence, successful testing trials were conducted.

The eventual shift made by Hopkinson to accommodate the practical and analytical traditions was part of a late 1890's pedagogical restructuring, amongst electrical engineers with different kinds of training, to work together using shared assumptions and techniques – laboratory and workshop techniques were increasingly combined, as had already been done by J. E. H. Gordon some ten years before. Gooday argues that the fact that the, initial, controversy has been explained, primarily, through educational terms and the fact that Hopkinson's controversial theory remained a point of reference in the electrical engineering debate can best be

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[96] (Gooday, 2002)

explained through the high social status attached to Hopkinson's Cambridge training. Disagreements with his theory seem to have been explained away through the contenders' apparent failure to understand the mathematics Hopkinson used – resulting in the situation in which those who had not been trained at Cambridge university "(…)came to see the Cambridge mathematics as part of the problem, rather than of the solution."[97] As such, Gooday argues, "(…) certain kinds of education - or their absence - define the very categories in which engineers of the past articulated their understanding about what was at stake in the successful prosecution of a new discipline."[98] Gooday warrants, therefore, that it would be wrong to ascribe the difference between the Cambridge mathematicians and engineers to a practical vs. theory dichotomy. It should, rather, be explained through the high social status Cambridge mathematicians seemed to enjoy and other factors, such as scholars' idiosyncrasies and attitudes.

In much the same way, the main differences between the HPS faculties in Bologna and Utrecht should not be explained through a simplified dichotomy of tacit and formal knowledge or practical and theoretical training. Though the faculties do not identify with the types of knowledge, specifically, like the Cambridge mathematicians and engineers seemed to have done, it would be wrong to assume that the differences between the faculties can be brought down to a simple dichotomy of tacit vs. formal knowledge, without taking into account professors' idiosyncrasies, graduates' credentials and the institutes' relative reputations. Much like the way in which Hopkinson's idiosyncratic teaching style played a role in the development and transfer of his theory, there is no doubt that professors' idiosyncrasies play a role in the way in which they transfer knowledge; every class room, in both Bologna's more traditional teaching of History and Philosophy of Science and Utrecht's PBL approach, the professor's personal style plays a role in his or her students' education. Additionally, the universities' respective reputations might influence their students' credentials and credibility during their studies, as well as, after their graduation. To explore these factors further, I will now, shortly, discuss idiosyncrasies and reputations in the context of the HPS faculties at the University of Bologna and Utrecht.

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[97] (Gooday, 2002)
[98] (Gooday, 2002, p.141)

Idiosyncrasies and Reputation

It seems that at the HPS faculty in Utrecht, idiosyncrasies play a, relatively, big role. As classes are small and the success of the PBL system is, largely, based on the way in which students and professors are able to work together, a professor's or teacher's personal teaching style may be decisive in what students are able to take away from class. This can work both ways – professors who adapt a style that is less suitable for the PBL system might be unable to steer students into fruitful discussions. Professors, for example, who are used to giving lectures or conferences, might be unable to create the room students need to give voice to their ideas. In much the same way, professors who are too lenient or too passionate about the topic might overcompensate; instead of guiding students they might position themselves in such a way that they become too much of 'the fellow student', failing to jump in when discussion fails or students are too hesitant to speak up.

Recognizable in Gooday's discussion of Cambridge mathematics is the fact that some strong personalities at the head of a class seem to have such a presence that the professors, unwillingly or not, are unsuccessful in transferring a set of different approaches to possible problems and, rather, transfer one specific approach favored by themselves. Further research into the career choices and post-graduation behavior of graduates is necessary to be able to indicate the extent to which, if they have, these specifically transferred methods have been instilled onto the minds of graduates - at this point it is impossible to speak of a possible 'HPS strategy' or a typical 'HPS set of skills and techniques' that is being transferred onto students. On the basis of observations, however, it could be argued that the PBL system seems to allow professor's personal interests and methods to become part of the class content.

The close and somewhat personal contact that students have with their professors, furthermore, seems to make students susceptible to subtle personal preferences that professors may, unconsciously or not, bring into the discussion. As the examinations are written and argumentation needs to be based on discussions in class, it is relatively easy for students to realize what professors might want to hear and might not want to hear. Though it is, virtually, impossible to assess whether or not professors and/or students purposely play into their own or others' personal

preferences, it does seem common for students to incorporate arguments in their work that seem to have been of particular interest to their professors, throughout the course.

At the scienze filosofiche faculty in Bologna, as classes are frequented by a relatively larger amount of students and instruction is carried out through a classical lecturing style, a lot of information is transferred, en masse, making it, relatively, difficult for personal teaching styles to shine through in students' instruction. Professors stick to a somewhat established course curriculum and students, since they are in great numbers and do not seem to have much personal contact with professors throughout class, are less susceptible to personal preferences or interests. What might be interesting to note, however, is the fact that because professors have quite some liberty in organizing their classes and are able to decide what materials to use, some classes that are taught by different professors, differ significantly in content. Though professors are supposed to stick to established guidelines, these guidelines allow for literature to be added, angles to be explored and different roles to be assigned to students with respect to participation. As such, examinations of similar courses that are taught by different professors might differ significantly – and, as such, personal preferences might play a bigger role in deciding what the curriculum is going to look like.

Students, therefore, inform themselves on upcoming exams by asking for information of other students; to be able to comprehend the extent to which a professor might decide to involve course content, class discussions and question rounds in students' oral exams, they seek advice of students who have already passed the exam. In the case of especially passionate professors, furthermore, it is relatively easy for students to signalize topics that seem of particular interest to professors. In exams, consequently, when students are asked to pick an argument to discuss, students might be urged to pick one of the topics the professor has seemed particularly disinterested, interested in and/or passionate about.

Due to the non-obligatory attendance, however, many students who take the examinations without attending classes would have no way of being subjected to specific personal teaching methods and preferences, since they simply were not there to witness it. They might inform themselves through Facebook groups or shared students' experiences but would not be able to be firsthand witnesses of professors'

approaches. Students who have established a somewhat informal rapport with one of the professors would be, fairly easily, influenced by the professor's personal choices in what knowledge to transfer. Students with a specific idea of what they want to do after graduation, furthermore, might be able to play into the interests and passions of a professor to be able to gain access to more knowledge and connections. This, however, goes for both the HPS faculty at Utrecht and the scienze filosofiche faculty in Bologna.

In contrast to the Cambridge mathematicians and engineers who seemed to identify with the specificity of their capabilities, practical or theoretical in nature, the two faculties do not seem to associate themselves, publicly, with a specific kind of knowledge. Even though, I have concluded that one of the main differences between the two faculties seems to lie in their different focuses on certain types of knowledge, this conclusion has not been based on official policy but, rather, on personal observation. It can be argued, however, that, even though, the two HPS programs might not, publicly, identify with a specific type of knowledge - be it tacit or formal- they do seem to be identified by others, with radically different types of instruction. In interviews with students and professors, instruction at the scienze filosofiche faculty seems to be, virtually always, referred to as 'traditional' or ´classical´ while the HPS program at Utrecht seems to be referred to as 'progressive' and ´international´. When asked why, most interviewees referred to the fact that in Utrecht instruction is in English; the fact that instruction in Bologna is in Italian; the fact that instruction in Bologna is based on a classic lecture system and the fact that the university in Utrecht, in general, seems, relatively, 'new' as compared to the historical university of Bologna.

As such, it seems that the two faculties seem to enjoy different reputations when it comes to their instruction. As discussed by Gooday, with respect to the Cambridge Mathematics reputation, the universities seem to differ in the extent to which their faculties are known abroad and within the country. In a national context, the universities seem to have a very prominent position in the university landscape. The University of Utrecht belongs to the top universities in the Netherland. Slightly different from the situation in Italy, Dutch universities are distinguished from another on the basis of their various specialties or specific course offerings, rather than on their overall quality. As such, the University of Utrecht seems to have a prominent

position in the Dutch university landscape, being, for example, the only Dutch university offering an internationally and interdisciplinary HPS program. In addition, it is known as one of the oldest universities of the Netherlands. The University of Bologna is recognized as one of the best universities in the country, known for its rich history and large student population - its scienze filosofiche program seems equally known and respected.

As the program in Bologna is frequented by a, significantly, larger amount of students, more students seem to know about the program. The HPS faculty, however, although it has grown in popularity, in recent years, is relatively small and, as a consequence, relatively unknown outside of its community; the community of history faculties, philosophy faculties, STS faculties, HPS faculties, Biology faculties and other relevant academic faculties and departments. It is, however, a program both nationally and internationally acclaimed. It is the only English History and Philosophy of Science research master in Europe and, as proudly cited on the university's website, has been, twice, judged 'best in category' by the national Master guide, in the categories Science and Policy and Philosophy. On many occasions, throughout my stay in Bologna, people responded with enthusiasm and awe to my Utrecht University background. They, eagerly, asked: "Cosa studi in Olanda?"[99] Not just fellow students but professors, even, seemed to be impressed by the fact that I was an HPS student in Utrecht. Responses ranged from wondering out loud whether or not the marijuana culture in Utrecht was the same as the one in Amsterdam, to several professors, very kindly, sharing their positive experiences at the HPS faculty and discussing future commitments. The face of one of my professors, at the exam, lit up when I shared I had been studying at the HPS faculty for the past year. He asked me: "Lei studia a Utrecht, veramente? Wauw. Loro sono bravi!"[100] Another professor told me about the kind colleagues she had met during her stay in Utrecht. She, passionately, explained how she found so much joy in visiting the country in which Spinoza and Descartes had lived, talking about the professors she had worked with and confessing her wish to return sometime soon.

Some people mentioned, however, that the educational system was very different from theirs. The fact that everything was in English had caused some

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[99] *"What do you study in Holland?"*
[100] *"You are studying at Utrecht, really? Wow. Those guys are good!"*

problems and, even though, the international student life was booming they had grouped together with other Italians. The amount of papers they had to write was shocking and, because of the velocity with which local students seemed to produce them, they had the feeling they were lagging behind. They seemed, however, excited by the parties and the Dutch hospitality. A significant amount of students seemed happy to spend their semester abroad with other Italian exchange students, exploring Dutch culture and spreading the Italian one. They would meet for the occasional pasta lunch break and, in doing so, invited local students to join. Similarly, many students indicated they were excited to be able to integrate into the 'Dutch lifestyle.' Many of them seemed very successful in mixing with the locals and had returned with 'so many international friends'.

The scienze filosofiche faculty in Bologna, similarly, seems to have an outstanding reputation. Although the university as a whole seems to be known, primarily, for its historic Law faculty, its history and philosophy departments attract many students from within and outside of the Emilia-Romagna region; 56.2 % of all its students, in 2013, came from outside Emilia-Romagna.[101] The Lettere e Beni Culturali department, to which the scienze filosofiche program belongs, has one of the highest student populations of all faculties and has one of the steadiest flows of newcomers each year.[102] Its international reputation seems to be somewhat different, however. The reactions I received to my decision to spend a semester at the University of Bologna ranged from friends and class mates asking me "Are you sure you know what you are doing?" and "Ah smart, I knew you needed a vacation..." to professors, sincerely, urging me to reconsider. The main reasons seemed to be based on the idea that the education in Bologna was somewhat below par or on the belief that I could definitely find 'better' universities; examples mentioned included the University of Minnesota and California. One professor in particular seemed very supportive, however, of my decision – he had studied in Bologna himself and, although he acknowledged that it was a different kind of education, had urged me to experience it for myself, seeing as how valuable he had found his experience to be. He explained how much he had enjoyed the language and university and seemed convinced it had been an unforgettable, educational experience.

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[101] (Unibo, 2014b)
[102] Idem.

When I asked international students in Bologna why they had chosen to study in Italy, many Erasmus students referred to their wish to speak Italian or to the fact that studying in philosophy in Bologna had been an obvious choice. One scienze filosofiche exchange students explained how he had been thrown back a bit by the "unexpectedly huge difference of language" but, when asked about the program itself, seemed very enthusiastic about the extensive literature studies and availability of books in French, German, Italian and English: "I cannot believe I get to study Lavoisier in French and in Italian!". He was impressed by the velocity with which students were able to read through philosophical works – something he had not been able to do yet. He, furthermore, indicated to have enjoyed classes but that he found it very hard to interact with locals. As local students moved in close groups, he argued, he always felt like an outsider. We agreed on the fact that professors, however, seemed very eager to work together with international students and seemed, virtually always, prepared to offer help where need be.

When I asked a group of Erasmus students frequenting a popular Erasmus bar in the centre whether or not they had been out with local students, virtually all of them looked at me, somewhat surprised, and said: "No." - their reason? "I know I am taking a language course but in my free time I'd rather hang out with English speaking students." The language issue seems a very sensitive one; although, some Erasmus students are very willing, in fact, to try and speak Italian, a lot of them seem to quickly resort to English, instead. Many Italians, moreover, indicated that they did not spend much time with the international students because they would, primarily, speak English – something that made them feel *offeso*[103] , *incompreso*[104] or *timido*[105] or because, as some more outspoken students explained, they felt that they always assumed Italians could not speak English and that they [the locals], therefore, refrained from trying – though most young Italian students seemed, to me at least, perfectly capable to have a quality conversation in English.

Though, it cannot be inferred that students coming from Utrecht are unable to catch up with the methods employed in Bologna and vice versa, much like non-Cambridge mathematicians could not follow the Cambridge mathematics, it has become clear that both students seem to have trouble adjusting to the faculties'

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[103] Insulted or slighted
[104] Misunderstood
[105] Shy

different approaches. HPS students in Bologna and Utrecht seemed to agree one thing, specifically. They had been frequently and, somewhat annoyingly, asked by friends and family: "What are you going to be able to do with this study in later life?"

World University Rankings

Apart from the seemingly different reputations the universities enjoy amongst students and staff, the international reputation they seem to enjoy shows similar differences. In many cases, people refer to their respective positions in the world rankings. Though many might argue that the world university rankings only have a small part in accounting for a university's quality, it is a fact that they have dominated the international university landscape in recent years. They have gained in both popularity and influence; universities use the ranks for the recruiting of new students, alumni donations and donors, new staff and faculty administration.[106] Education systems are becoming more 'marketized' and competitive, thus forcing the higher education institutes to act like businesses.[107] The concept *rendementsdenken*[108] in the Netherlands seems to be essential to the recent screams for change in the country's higher education.

In one of the leading rankings, *the Times Higher Education World University Ranking,* Bologna appears at the bottom of the top 300; Utrecht is placed on the 79th position. In one of the spin-off rankings, the top 100 World Reputation Ranking, in which universities' international reputation are listed, Bologna does not appear - Utrecht can be found at the 71-80th position. Though, the rankings have gained a lot of influence over the years, especially in the context of an increasing globalization of the university system, one should be cautious taking the rankings at face value. In an article written by Brian Pusser and Simon Marginson entitled *University Rankings in Critical Perspective[109]* the two writers argue that university rankings offer insight into the use of power in higher education, rather than quality; rankings, they argue, "(…)are used to confer prestige, in the allocation of resources, as a form of agenda setting, as a means of stratifying national higher education systems, as a means of

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[106] (Grewal, Dearden, & Lilien, 2008)
[107] Idem.
[108] 'A state of mind that is characterized by the desire to maximize profit' in this context it refers to universities being organized and managed like corporations.
[109] (Pusser & Marginson, 2013)

establishing hierarchical relations between nations, and as a lever to impose demands for accountability and normative adaptation."[110] In addition, considering the extent to which postsecondary league tables are fixated upon by the global community and the importance that is attached to higher education in national and international economic development, Pusser and Marginson argue that rankings indicate how power shapes the contemporary relationships between social actors, society, states and institutions.[111] The rankings, they argue, "[A]re dominated by powerful, intentionally-enacted norms and distinct interests, to the degree that perhaps the greatest utility in rankings is that they can serve as significant indicators of relations of power and contest within states as those states provide and regulate higher education."[112]

Due to the World University Ranking, institutions seem to transform themselves in pursuit of the institutional power that flows from a top position in international rankings. Universities and other higher education institutions that hold a high position in the rankings attract many, highly prepared students from around the world and function as international platforms of influence. As such, competition between states and institutes is increased and, furthermore, due to the growing global competition, disciplinary and academic norms are preserved in light of the annually and highly visible rankings of performance. Consequently "[s]tates and institutional managers seek the forms of behavior and specific outcomes that will maximize rankings performance - for example, concentrations of high-quality research activity, enhanced student selectivity (often in tension with social access), marketing campaigns designed to artificially boost reputation, and so on."[113]

Due to this "rankings effect", as Pusser and Marginson name it, rankings have a disciplinary role in the sense that the institutions and states are disciplined by the assessment metrics and that they, additionally, are taught how to apply discipline themselves by implementing the appropriate norms and criteria judged in rankings.[114] Seeing as how most ranking system are consistent with some of the strongest higher education systems such as the ones, primarily, located in English speaking countries such as the United States, the ranking systems are very disadvantageous for countries outside of the U.S. As such, all institutions, regardless of their diverse state goals,

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[110] P.544
[111] (Pusser & Marginson, 2013, p.545)
[112] Idem.
[113] (Pusser & Marginson, 2013)
[114] Idem.

national histories, languages, cultures and traditions are all pressed into the one template: that of the dominant universities. These universities, therefore, naturally, make up the absolute top of the world university rankings.

The dominant institutes are universities and colleges that are research-intensive; universities and colleges that have selective admissions policies; that have a particular focus on science and technology and that conduct funded research in various disciplines – such as, for example, the 'progressive' and 'international'[115] University of Utrecht. Despite conflicting state goals, missions inherited in relation to nation-building and social access, some goals have become preeminent – such as science research outputs. Pusser and Marginson argue that "[t]he disciplinary process of global ranking is both leading a process of global postsecondary strategic convergence and undermining aspects of traditional national policy agendas."[116] Consequently, the globalized and international state project of educational reforms that is being pursued is not just national but neo-imperial: it is a system tailored to the nations that are, traditionally, dominant in higher education; the Western nations and most importantly the United States and United Kingdom led English-speaking countries. [117]

The cross-national normalization in the ranking process, despite the heterogeneity of the postsecondary landscape, seems to be characteristic of a meta-state project; it embodies the interests of the globally dominant countries in which all institutions and states are brought together in a global hierarchy.[118] The Times' World University Ranking's website indicates that the criteria used can be divided into four core missions: research, knowledge transfer, international outlook and teaching and, furthermore, indicates that the World Reputation Rank is based on highly subjective criteria. Pusser and Marginson note that, as such, though, traditionally, the university held a commitment to both private and public goods, the ranking criteria on which institutes are judged point to universities that produce, primarily, private goods. Little attention is paid to goals such as improving student access from underrepresented

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[115] Here I refer to the, aforementioned, qualities that were attributed to the institution by the interviewees.
[116] (Pusser & Marginson, 2013)
[117] Idem.
[118] (Pusser & Marginson, 2013)

groups, increasing the affordability of quality education, social justice and contribution to community development.[119]

The pressure on European universities to reform can be explained through two principal reasons; in their article *Governance Reforms and Organizational Dilemmas in European Universities[120],* Giliberto Capano and Marino Regini argue that in the last two decades European universities have been facing an enormous increase in costs, due to the convergence of the higher education landscape into a mass university system and that, additionally, European public policy has, increasingly, been incorporating New Public Management principles; specifically 'managerialism', privatization and performance measurement.[121] They argue that "[i]n a very general sense, the governance reforms undertaken in Continental Europe may be seen as repeated attempts to converge toward what is generally regarded as the most successful HE model, namely, the Anglo-American one."[122]

It should come as no shock, therefore, that the University of Bologna is placed at the bottom of world university rankings, if at all, and referred to as traditional, classic and 'old'. Its system, despite recent successful reforms, is not based on the popular Anglo-American model. It is, rather, the result of age-old tradition and culture, shaped by war, politics and reforms in recent centuries. It is anchored in a very nationalistic context, shaped by fascist reforms and elitist models and, despite recent reforms to shift its focus on a more globalized character, the Italian university system seems to have been unable, so far, to 'catch up' with the dominant English speaking universities. Consequently, ignoring all other criteria such as its involvement in local culture; the quality of the teaching materials and its role in promoting education to young students, it is judged poorly by international advisement and assessment organs.

It would be wrong to infer, however, that since the educational system of the University of Bologna is based on a model other than the one strived after in new European public policy, the university should be bumped up to the top of the ranking - nor does it mean that Utrecht does not deserve its top hundred spot. Similarly, it would not be fair to assume that, since the rankings are based on criteria that

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[119] Idem.
[120] (Capano & Regini, 2014)
[121] (Capano & Regini, 2014)
[122] Idem.

correspond with the features of dominant Anglo-American universities, these universities do not deserve a position in the top of the world university ranking. To be able to judge whether or not a university is, rightfully, placed on a certain position in the ranking, the development of a completely new quality assessment would be necessary – but on what criteria would this new quality assessment be based?

It is, however, not my intention to design a new way of assessing the quality of universities and, therefore, consequently, not my intention to assess whether or not the universities that are placed at the bottom and top of the ranking have been put there with good reason. It has, however, become clear that rankings ought to be read and interpreted with some caution. Utrecht's HPS education model seems comparable with the Anglo-American model - with its research intensive focus; English as its main language of instruction; its competitive atmosphere and its focus on tacit knowledge – and, as such, seems to have the characteristics that are highly compatible with the ranking criteria of leading world university rankings. As such, it is more likely to be judged, positively. Scienze filosofiche in Bologna, on the other hand, is based on the Anglo-American model to a lesser extent - with its focus on formal knowledge; its intensive study of a vast amount of philosophical and historical works in their original language; its atmosphere of competition placed on a national level, rather than an international one; Italian as its main language of construction and its strong cultural, local and traditional ties. As such, it seems to have characteristics that are less compatible with ranking criteria and is, therefore, less likely to be judged positively in the world university rankings.

As a result of their different positions in the rankings, the two universities seem to enjoy different social statuses. Though, a university has to work to be a part of the university rankings, it seems that as soon as it has gained a position in the top of the world ranking its position is maintained – the fact that a university has earned a spot at the top of the world rankings becomes a cause of prestige itself; through its top position a university is able to recognize and further focus on the exact criteria that are deemed valuable by the committees; as such the rankings take up a disciplinary role.[123] Rankings, as such, "(…) elevate some nationally-based interests (business, finance systems, wealth accumulation) above others (especially those traditionally not provided by select models of postsecondary education), while again strengthening the

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[123] (Pusser & Marginson, 2013)

global position of the strongest nations.[124] Breaking through this cycle of maintaining top positions, within the current system of rankings, seems, virtually, impossible without revision of the entire system.

In the case of the World Reputation Rank, the argument is slightly different. As the rank itself deals with social status, it would be difficult to argue that because of a university's high position in the World Reputation Ranking it would gain and maintain high social status – for what is the difference between social status and reputation and how did it end up at that position, in the first place? It can be argued, however, that the World Reputation Ranking has a significant role in verifying and maintaining the top-positions of the universities in the World University Ranking by offering a 'second confirmation' of their leading position – the top ten of the World University Ranking and World Reputation Ranking are made up out of nine of the same universities; the only university that did reach the top ten in the World University Ranking (9) but did not reach the top ten of the World Reputation Ranking (14) is the Imperial College of London.

As has become clear, therefore, the HPS departments of the university of Bologna and Utrecht differ not only in their different emphases on tacit and formal knowledge but, just as well, in the way they are viewed in a national and international context. Just as the Cambridge mathematicians were held in high regard, certain top ranking universities carry the stamp of success, quality and progressivity, whereas others do not. Consequently, the 'successful' universities attract very different students and, in turn, deliver graduates with a very different social status. Placed in a global context and based solely on the rankings, this would seem to translate in a quality difference between the two but I would like to argue that this conclusion is made too hastily and is not, perhaps, necessarily, reflective of the universities' respective qualities. As mentioned in my previous discussion of Kenji Ito's *The Geist in the Institute: The Production of Quantum Physics in 1930s Japan*, it would be naïve to assume that a dominant teaching system, valued highly by other countries, can be transported, without problems onto another country, culture or institute – a pedagogical environment cannot be transferred onto another culture "(…)much like a machine which can without further ado be transported from the West to any other

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[124] (Pusser & Marginson, 2013)

part of the world there to continue its labors."[125] So why would it be fair to judge institutions on their attempts to do so?

Conclusion

Over the years, qualitative research in sociology of education has, significantly, increased. It seems to closely involve the worlds of policy and practice in sociology of education and, since many scholars who do not specifically identify themselves as sociologists and have different academic backgrounds and vantage points are involved in sociology, the fields' boundaries have become fluid and, increasingly, accessible.[126] Broadly defined, qualitative research should be considered as drawing "(…) a large net around any research that uses methods of gathering observational, communicative (natural discourse or interview), or documentary (artifactual [sic.]) data derived from natural settings."[127] As qualitative researchers use nonmathematical methods to analyze and understand situations, it is important they try to maintain their objectivity, to prevent bias from entering the research – which is something I hope to have done, sufficiently. Qualitative research, as conducted by, for example, Latour, Woolgar and Traweek, has proven valuable in researching systems and institutions, as it allows researchers to analyse what lies at the core of scientific practice; the daily routines, exchanges and communication that involve individuals and materials of a network.

To research pedagogical environments, qualitative research has proven just as valuable. Though a field still, slightly, unexplored, recent work of scholars such as Cyrus M. Mody, Kenji Ito, Hugh Gusterson, Andrew Warwick, Sharon Traweek, David Kaiser and Graeme Gooday - to name a few - illustrate the importance of research into the role of training, or scientists' training, in the study of history, sociology, and anthropology of science or, more broadly, the role of pedagogy in the study of science. Through comparative research, especially, the types of knowledge that play a role in different training regimes can be distinguished from each other and compared to one another as to be able to, hopefully, ultimately, illuminate key-factors and practices in

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[125](Ito, 2002)
[126] (Riehl, 2001)
[127] (Riehl, 2001, p.116)

the generation of knowledge. As has become clear, both HPS faculties in Bologna and Utrecht are aimed at arming students with the tools and knowledge that are believed to be necessary in post-graduation life: in Bologna, it is assumed that graduates will benefit most from obtaining an *extensive body of knowledge* that will enable them to be useful and employable in various disciplines and social situations, outside and inside of the academic community; at the HPS faculty in Utrecht, it is assumed that graduates will benefit most from developing *an extensive amount of tools and research skills* enabling them to be employable and useful in various disciplines and social situations, outside and inside of the history and philosophy of science community.

It seems, however, that in both Bologna and Utrecht, graduates struggle in finding desired positions after graduation - which might be indicative of their training not being sufficient in preparing them for their post-graduation future. Though, in Bologna, many graduates find jobs outside of their specialty, graduates lack the skills necessary for employment in the growing, international HPS community. In Utrecht, students, often, find jobs within their specialty, either in the Netherlands or abroad, but seem to experience difficulties in finding jobs in related or, relatively, unrelated disciplines. Though, further research is necessary to be able to infer what role external and other possible factors have in the matter and in what way they tie in with the factors discussed, it should be noted that in light of recent education reforms and the growing popularity of Anglo-American oriented teaching models, it has become, increasingly, important to keep in mind what should be at the center of our concerns: instead of being, primarily, occupied with reputation, international presence, profit maximization and prestige, the organization of pedagogical training and its, crucial, social and cultural circumstances should be at the centre of our attention.

As the internationalization of the university landscape seems to emphasize the fact that we all share different backgrounds, we ought to try and resolve our differences by making collective sense of the world, rather than trying to fit everyone into one single template.[128] As such, depending on students' individual abilities and interests, training regimes should, perhaps, be focused on enabling students to develop into James Swinburne's multifaceted practitioner, who had to "(…) not be only an overgrown wireman, a mechanical engineer with a little electrical knowledge, a mathematician, a financier, a lacquered brass and sealing-wax varnish instrument

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[128] (Gooday, 2002)

maker, a physicist, or a manager of men[,]", but rather all these things, albeit it 'in different proportions in different men.'[129] Even though, one year of experiences at both universities, hardly, allows for a complete understanding of the two different teaching systems, it does provide initial insight into the difficulties and values of comparing and analyzing, seemingly, different pedagogical environments. Further research based on a, perhaps, longer stay at the respective institutes and a deeper embedment in their respective environments could, possibly, allow for a more profound understanding of the universities' practices and the crucial, cultural and social factors that contribute to them - most likely, resulting in a more accurate analysis of the institutions' pedagogical environments. As *nessuno nasce imparato* it would be foolish to assume that there is nothing left to learn.

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[129] Idem.

nessuno nasce imparato

July 2015, Bologna

I think it is like leaving after a dinner at a friend's house for the first time. At the beginning, everything seemed off and odd. The furniture seemed to be positioned in a weird way. The house smelled funny. Everything seemed to be done so inefficiently. Music was playing during dinner and the cat was walking around under the table. My friend's dad was making such strange jokes and we did not even get desert! At my Italian friend's house, in the beginning, everyone was loud. The colors of the walls were different. We had so much - so much! - food. My friend's mom would not sit down and people kept interrupting me. I had to drink Limoncello and coffee and then Limoncello again! The house was so hot because of all the sunshine streaming in through the windows.

At my friend's house, in the beginning, everything seemed off and odd – but I took some time to adjust. I have never eaten pasta that smells so delicious before. It was really nice to always have someone to talk to! At my friend's house I got to go to the toilet, even when we were in the middle of dinner. The entire house was bathing in sunlight; it seemed to make everything so much happier! The cat seemed to like me and at the end she meowed and, even, crawled on my lap. She was so soft. The Limoncello, after the second try, actually tasted quite nice! As soon as I understood the dad's jokes, I found out he was actually funny. At my friend's house it took some time to adjust – but when I did, I really did not want to go. So tomorrow I will go to have dinner at my friend's house. For the second time.

BIBLIOGRAPHY

Agasistia, T., & Pohlb, C. (2012). Comparing German and Italian Public Universities: Convergence or Divergence in the Higher Education Landscape? *Managerial and Decision Economics, 33*, 85.

Capano, G., & Regini, M. (2014). Governance Reforms and Organizational Dilemmas in European Universities. *Comparative Education Review, 58*(1), 30.

Collins, H. M. (1975). The seven sexes: A study in the sociology of a phenomenon. or the replication of experiments in physics. *Sociology, 9*, 19.

Collins, H. M. (1985). *Changing Order: Replication and Induction in Scientific Practice*: Sage.

coordinator, H. (2013). Alumni, their mastertheses and jobs- History and Philosophy of Science. Utrecht: University of Utrecht.

Evink, V. (2014). *Unity Makes Strength.* University of Utrecht, Utrecht.

Foucault, M. (1970). *The Order of Things: An Archeology of the Human Sciences*: Pantheon.

Foucault, M. (1977). *Discipline and Punish: The Birth of the Prison*: Pantheon.

Gooday, G. (2002). Fear, Shunning, and Valuelessness: Controversy over the Use of "Cambridge" Mathematics in Late Victorian Electro-Technology. In D. Kaiser (Ed.), *Pedagogy and the Practice of Science*. Massachusetts: The MIT Press.

Grewal, R., Dearden, J. A., & Lilien, G. L. (2008). The University Rankings Game: Modeling the Competition among Universities for Ranking. *The American Statistician, 62*(3).

Gusterson, H. (2002). A Pedagogy of Diminishing Returns: Scientific Involution across Three Generations of Nuclear Weapons Science. In D. Kaiser (Ed.), *Pedagogy and the Practice of Science* Massachusetts: The MIT Press.

Ito, K. (2002). The *Geist* in the Institute: The Production of Quantum Physicists in 1930s Japan. In D. Kaiser (Ed.), *Pedagogy and the Practice of Science*. Massachusetts: The MIT Press.

Kaiser, D. (2005). *Pedagogy and The Practice of Science* (D. Kaiser Ed.). Cambridge: The MIT Press.

Kaiser, D., & Warwick, A. (2002). Kuhn, Foucault, and the Power of Pedagogy. In D. Kaiser (Ed.), *Pedagogy and the Practice of Science*. Massachusetts: The MIT Press.

Kools, F. (2011). "Ambieer het niet!". *de Observant*.

Kuhn, T. (1970). *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Latour, B. (1982). Give Me a Laboratory and I will Raise the World *Science Observed; Perspectives on the Social Study of Science*. London: Sage.

Latour, B., & Woolgar, S. (1979). *Laboratory Life: The Construction of Scientific Facts*. Beverly Hills: Sage Publications.

Mody, C. C. M. (2002). Instruments in Training: The Growth of American Probe Microscopy in the 1980s. In D. Kaiser (Ed.), *Pedagogy and the Practice of Science*. Massachusetts: The MIT Press.

NormAteneo. (2011). Regolamento per la disciplina dei contratti di insegnamento e di tutorato

Pusser, B., & Marginson, S. (2013). University Rankings in Critical Perspective. *The Journal of Higher Education, 84*(4).

R.C. Simonini, J. (1954/1955). The universities of Italy. *Bulletin of the American Association of University Professors, 40*(4), 592.

Riehl, C. (2001). Bridges to the Future: The Contributions of Qualitative Research to the Sociology of Education. *Sociology of Education, 74*(extra), 19.

Rosier, A. (2015). [interview].

nessuno nasce imparato

Schmidt, H. G. (1983). Problem-based Learning: Rationale and Description. *Medical Education, 17*(11-16).

Soda, F. (1968). Education in Italy. *The Modern Language Journal, 52*(4), 201.

Traweek, S. (1992). *Beamtimes and Lifetimes*. Boston: Harvard University Press.

unibo. (2013). Documento di sintesi sui doveri dei professori e ricercatori universitari *Note e Circolari di Ateneo*. Italy: Università di Bologna.

unibo. (2014a). biblioteche università di Bologna.

Unibo. (2014b). Rapporto di Valutazione Anno 2013: Ufficio di Supporto al Nucleo di Valutazione

unibo. (2014c). scheda dati occupazione almalaurea Bologna: Alma Mater Studiorum Bologna.

UU. (2014).

Warwick, A. (2003). *Masters of Theory*. Chicago: University of Chicago Press.

Yavets, I. (1993). Oliver Heaviside and the significance of the British electrical debate. *Annals of Science, 50*.